



# ON THE NATURE OF QUANTIFICATIONAL EXPRESSIONS AND THEIR LOGICAL FORM

岸本, 秀樹

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ON THE NATURE OF QUANTIFICATIONAL EXPRESSIONS  
AND THEIR LOGICAL FORM

(量化表現の特性とその論理形式について)

ON THE NATURE OF QUANTIFICATIONAL EXPRESSIONS  
AND THEIR LOGICAL FORM

A DISSERTATION PRESENTED

by  
Hideki Kishimoto

B.A. Kobe University  
(1983)

M.A. Kobe City University of Foreign Studies  
(1986)

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ABSTRACT

The principal aim of this dissertation is to show that there is a very close correspondence between movements occurring in syntax and LF with regard to Subjacency, and to defend the view that Wh raising is constrained by Subjacency, irrespective of whether it occurs in syntax or in LF. Since Huang (1982b), it has often been claimed in the literature that Subjacency is a constraint pertinent only to S-structure movements, but this study contends that Subjacency is on the contrary constrains both S-structure and LF Wh movements and that Subjacency must constitute a part of general conditions imposed on movement rules. This thesis amply demonstrates that Subjacency is indeed a vital constraint even on LF Wh fronting, dealing mainly with the scope phenomena of wh constructions in English, Sinhalese and Japanese.

In Chapter 1, we introduce some basic notions of the general theoretical framework that is adopted in the thesis. In Chapter 2, we present a discussion on the scope of wh-in-situ found in multiple wh questions in English. Those wh phrases are usually assumed to undergo Wh movement in LF in the standard analysis, but this chapter claims, contrary to the commonly held assumption, that the scope of unmoved wh phrases is optimally characterized on the assumption that Wh raising does not affect wh-in-situ at the LF level, and that unselective binding, rather than Wh raising, serves as the basis for assigning scope to wh-in-situ. In line with this analysis, we put forward the claim that wh phrases are divided into two classes, quantifiers and variables, according to whether they are moved by Wh raising or not.

Chapter 3 discusses the nature of LF Wh raising, which is attested in languages such as Japanese, Sinhalese, etc. and argues that the LF derivation of Wh raising is constrained by Subjacency, making crucial use of data from Sinhalese. It is also argued that apparent immunity to Subjacency, which we usually observe in LF Wh raising, must be explained away in reference to the notion of LF pied piping, and further that a pied piped constituent is identified by a quantificational domain marker, which we claim to define the quantificational domain of a 'wh' expression.

Chapter 4 and 5 are devoted to exploring ways of confirming the analysis suggested in Chapter 3. Specifically, in Chapter 4, we focus on presenting a confirmation for the view that Subjacency is observed even in LF Wh raising, drawing examples from the two types of concessive clauses in Sinhalese, i.e. 'universal' and 'existential' concessive clauses. Our major contention in this chapter is that the facts observed in the Sinhalese concessive constructions can constitute a sufficient ground for forwarding the claim that pied piping may take place in the concessive clauses in Sinhalese (if an appropriate environment is furnished) and that Wh raising found in the concessive clauses is also constrained by Subjacency.

Further exploring the pied piping analysis, Chapter 5 aims to provide an answer to the question of whether or not a wh phrase located within an island needs to get governed by a Q element in LF. In this chapter, we argue, basing our discussion on the concessive construction in Japanese, that a wh phrase occurring within an island does not have a status of a wh quantifier, despite its morphological shape, and that such a wh phrase does not undergo any 'quantifier' rule, so that governance by a Q element is irrelevant for the wh phrase.

In Chapter 6, we proceed to consider some differences between a zero pronoun and the overt pronoun sore in Japanese, which apparently behave like bound variables. On the basis of the facts regarding scrambling, we first argue that surface configurations are not immediately relevant for bound pronoun interpretations, and that LF is a level of representation where the relevant construal is provided. This chapter then argues that the scrambling facts offer us the evidence that while a zero pronoun is allowed to serve as a bound pronoun, an overt pronoun like sore is not. It is further argued that the interesting correlation which obtains between complementizer deletion and the extractability of wh phrases in bridge and non-bridge verbs provides us with a piece of confirming evidence for the view being advanced here.

## ACKNOWLEDGMENTS

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## LIST OF ABBREVIATIONS

Besides commonly used abbreviations, we make use of the following notational abbreviations (in word-by-word glosses):

NOM:	Nominative Case
GEN:	Genitive Case
ACC:	Accusative Case
DAT:	Dative Case
TOP:	Topic Marker
Q:	Q Element (The symbol is used for standing for interrogative, existential and universal Q elements)
∅:	Zero Pronoun
INDEF:	Indefinite Marker
COP:	Copula

## CHAPTER 1

### INTRODUCTION

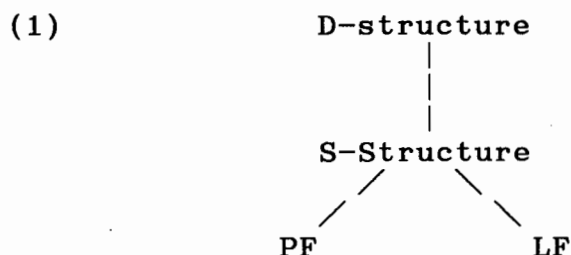
#### 1.1. Introductory Remarks

The main purpose of this thesis is to defend the position that Subjacency is a viable constraint on movement even in LF, and to show that Wh movement is constrained by Subjacency irrespective of whether it occurs in S-structure or in LF. Prior to entering into the discussion, let us note that throughout the thesis, we assume, as a background framework, a theory of generative grammar which has been called the Government-and-Binding theory, or more recently, the Principles-and-Parameters approach. In this introductory chapter, we first review some basic notions which are directly related to the discussion that follows, and then we outline the contents of the thesis at the end of this chapter.

#### 1.2. The Principles-and-Parameters Approach.

In this study, we will follow the basic features of the Government and Binding Theory, or more recently, the Principles-and-Parameters Approach. In particular, we will

assume the model of core grammar, as represented in (1):



One characteristic of the present model is that the mapping between different levels of representation is related through the single rule of move  $\alpha$ . Within this type of model, D-structure, S-structure and LF are represented via a series of applications of the relevant 'move  $\alpha$ ' rule:

- (2) a. D-structure: [ [ who loves everyone ] ]  
b. S-structure: [ who<sub>1</sub> [ t<sub>1</sub> loves everyone ] ]  
c. LF: [ who<sub>1</sub> [ t<sub>1</sub> [ everyone<sub>j</sub> [ loves t<sub>j</sub> ] ] ] ]

The D-structure, S-structure and LF representations are constrained by the Projection Principle, which roughly states that  $\theta$ -marking properties of each lexical item must be projected at each level. The application of move  $\alpha$  and their resulting representations are also constrained by the following principles:

- (3) a. X-bar theory  
b.  $\theta$  theory

- c. Binding theory
- d. Government theory
- e. Bounding theory
- f. Case theory
- g. Control theory

Among the subsystems of the core grammar, immediately relevant to our subsequent discussions are the subtheories (3a) through (3e). For ease of exposition, let us conduct a brief survey of the subsystems that are directly related to our subsequent discussions.

#### 1.2.1. X-bar Theory.

The central idea of X-bar theory is that phrases are projections of lexical properties. The well-formed X-bar schema imposed on phrase markers is assumed to have the form in (4):

- (4) (i)  $X' = X X''^*$   
 (ii)  $X'' = X''^* X'$  (order irrelevant)  
 where  $X''^*$  stands for zero or more occurrence of some maximal projection.

The symbol  $X''$  in (4i) is referred to as the complement of  $X'$  and  $X''^*$  in (4ii) as the specifier of  $X'$ .

### 1.2.2. $\theta$ Theory.

$\theta$  theory is concerned with the status of arguments taken by predicates, and the theory defines the well-formedness of an argument structure in terms of  $\theta$  roles assigned to arguments. The basic principle of  $\theta$  theory is the  $\theta$  criterion, which is given below:

- (5) Each argument bears one and only one  $\theta$  role, and each  $\theta$  role is assigned to one and only one argument.

The  $\theta$  criterion is assumed to hold at LF. In our discussion, the quantificational structure of a sentence is claimed to be constrained by the  $\theta$  criterion. In the standard assumption,  $\theta$  roles may only be assigned to a subject or a complement of a predicate, and these positions are referred to as A positions. Other positions such as the landing sites of wh phrases or quantified expressions are referred to as A' positions (or non-A positions).

### 1.2.3. Binding Theory.

Binding theory consists of three conditions to state the generalization about the distributional properties of three types of nominal expressions, namely, anaphors, pronominals

and R-expressions. The conditions imposed on these expressions are stated as follows:

- (6) (a) An anaphor is bound in its governing category.
- (b) A pronominal is free in its governing category.
- (c) An R-expression is free.

For our purposes, it is sufficient to state that a governing category can roughly be viewed as the minimal S(=IP) or NP containing a nominal expression and its governor. For a more elaborated definition of binding theory, the reader is referred to Chomsky (1986a).

#### 1.2.4. Government Theory.

The notion of government plays an important role in some of the subsystems of the core grammar. In the following, we will mostly follow the definitions presented in Chomsky (1986b). Since we will be dealing with some adjunction structures involving quantification, we need to take the definitions of exclusion and domination into consideration before we define government. We construe these definitions as follows:

- (7) a.  $\alpha$  is dominated by  $\beta$  if it is dominated by every segment of  $\beta$ .
- b.  $\alpha$  excludes  $\beta$  if no segments of  $\alpha$  dominate  $\beta$ .

We now turn to the fundamental configurational notions of c-command and government:<sup>1</sup>

- (8) a.  $\alpha$  c-commands  $\beta$  iff  $\alpha$  does not dominate  $\beta$  and every  $\gamma$ ,  $\gamma$  a maximal projection, that dominates  $\alpha$  dominates  $\beta$ .
- b.  $\alpha$  governs  $\beta$  iff  $\alpha$  c-commands  $\beta$  and there is no  $\gamma$ ,  $\gamma$  a barrier for  $\beta$ , such that  $\gamma$  excludes  $\alpha$ .

Even though the definition of government is made through the notion of exclusion, it makes no difference whether government is defined in terms of exclusion or domination if adjunction structures are not involved. Government is also subject to the Minimality Condition, but since it is irrelevant for the theory of movement, we do not touch upon the definition here.

#### 1.2.5 Bounding Theory.

The notion of Subjacency plays a very important role in the discussion that follows. In the classical Subjacency analysis, Subjacency is defined by the notion of bounding nodes, and S (=IP) and NP are considered as constituting the

---

1. The definition of c-command here corresponds to that of m-command in the sense of Chomsky (1986b). For various definitions of 'c-command', see Chomsky (1981), Aoun and Sportiche (1982), May (1985), Reinhart (1983) etc.



relevant bounding nodes in English (cf. Rizzi (1982)). More recently, the boundedness requirement for movement is further refined and is defined by the notion of "barrier" in Chomsky (1986b). Although it may be immaterial for the most part of our discussion how we can define a node that counts as a barrier, some definitions relevant for the notion of "barrier" are presented below.

In order to define the notion of "barrier" which plays a central role in determining the boundedness requirement for movement, it is necessary to first define the notion of "Blocking Category" (BC):

- (9)  $\gamma$  is a BC for  $\beta$  iff  $\gamma$  is not L-marked and  $\gamma$  dominates  $\beta$ .

Based on the definition of BC, the concept of "barrier" can be defined as follows:

- (10)  $\gamma$  is a barrier for  $\beta$  iff (a) or (b)  
a.  $\gamma$  immediately dominates  $\delta$ ,  $\delta$  a BC for  $\beta$ ;  
b.  $\gamma$  is a BC for  $\beta$ ,  $\gamma \neq \text{IP}$ .

In (9) and (10),  $\gamma$  must be understood as a maximal projection and 'immediately domination' as holding between maximal projections. The notion of L-marking in (9) is defined in terms of  $\theta$ -government:

- (11) a.  $\alpha$   $\theta$ -governs  $\beta$  iff  $\alpha$  is a zero-level category that  $\theta$ -marks  $\beta$ , and  $\alpha$ ,  $\beta$  are sisters.  
 b.  $\alpha$  L-marks  $\beta$  iff  $\alpha$  is a lexical category that  $\theta$ -governs  $\beta$ .

The basic principle of 'bounding theory', namely, the Subjacency condition, requires that every link  $(\alpha_i, \alpha_{i+1})$  must meet the condition of 1-subjacency. This condition is defined as follows:

- (12) If  $(\alpha_i, \alpha_{i+1})$  is a link of a chain, then  $\alpha_{i+1}$  is subjacent to  $\alpha_i$ .  
 (13)  $\beta$  is  $n$ -subjacent to  $\alpha$  iff there are fewer than  $n+1$  barriers for  $\beta$  that exclude  $\alpha$ .

According to Chomsky (1986b), the term 'subjacent' is meant to be 1-subjacent; the best possible case of movement is that there is no barrier intervening between every chain and it is the case of 0-subjacent. The chain which is 1-subjacent is also a well-formed chain but the acceptability of the resulting chain declines to some degree. In the case of 2-subjacency, movement yields a considerable decrement in acceptability.

### 1.3. The Empty Category Principle

One of the most prominent principles in the context of Wh movement is the ECP (the Empty Category Principle). The definition of the ECP can be given as follows:

- (14) A nonpronominal empty category must be properly governed.

For the purpose of exposition, we assume the version of the ECP, which is given in the following:

- (15)  $\alpha$  properly-governs  $\beta$  iff  
    i)  $\alpha$   $\theta$ -governs  $\beta$  (lexical government)  
    or ii)  $\alpha$  antecedent-governs  $\beta$  (antecedent government).

The classical version of the ECP can also be stated essentially along the same line as above. For the details of the classical definitions, especially, refer to Lasnik and Saito (1984).

#### 1.4. Some Speculations on Logical Syntax

One very important aspect of GB type theory is that LF is related to S-structure primarily by 'Quantifier Rule' (QR) and similar interpretive processes which are essentially viewed as manifestations of move  $\alpha$ . Although the effect of

move  $\alpha$  at the level of LF is not visible on surface strings, it is commonly assumed that the quantifier scope and the scope of question words are directly dealt with at this level. If these kinds of interpretive dependencies are actually proved to hold in the level of LF, it would be an interesting indication that there is something empirically significant about the nature of Universal Grammar (UG), since LF would be a universal output to feed into semantic interpretations. Appealing to such tactics seems to obtain some support from cross-linguistic comparisons. As an illustration, consider the following Chinese example (cf. Huang (1982b)):

(16) Wo xiang-zhidao [ Lisi mai-le sheme ]  
I wonder Lisi bought what  
'I wonder what Lisi bought.'

In Chinese, unlike English, wh phrases are not moved by the rule of 'move  $\alpha$ ' in the syntax, but the interpretation of the question is essentially the same as that of the English wh question. In the Government and Binding framework, it is claimed that movement of wh phrases is introduced solely at the level of LF in Chinese, and in order to represent the fact that (16) is interpreted as an indirect question, but not as a direct question, it is necessary for LF move  $\alpha$  to be instantiated in such a way as to move the interrogative word to the clause boundary of the subordinate clause, just as in an English singular wh question, yielding the following

representation at the LF Level:

(17) [<sub>CP</sub> Wo xiang-zhidao [<sub>CP</sub> sheme<sub>i</sub> [<sub>IP</sub> Lisi mai-le t<sub>i</sub> ]]]

In the LF representation in (17), the moved wh phrase sheme 'what' represents the fact that the wh phrase is interpreted as taking scope over the embedded clause, and construed as an indirect question. If we deal with the Chinese wh question as indicated above, we can see immediately that the LF structure is readily likened to an English wh interrogation and that the semantic properties of the question are handled in an analogous way as in English. Since this analysis is quite sound, we will adopt, without any justification, the view that LF is a level of syntactic representation which (universally) represents the scope properties of quantified expressions.

In addition to this, there is another important feature of the GB framework in regard to the treatment of the scope properties of quantified expressions at the LF level; that is, the GB framework maintains that the interpretive effects of LF move  $\alpha$  rules such as QR are configurationally defined in terms of the structural notion of 'c-command'. This is an essential of the GB analysis, and in accordance with this analysis, we take it for granted, following Chomsky (1986b) and partly, May (1985), that the scope of a quantified expression is regarded as a structural property of an LF con-

figuration and that the notion of 'scope' can be defined as follows:

- (18) The scope of  $\alpha$  is the set of nodes that its operator c-commands at LF.

To be a bit more specific about the nature of 'quantifier' mapping, let us consider the configuration in (19b):

- (19) a. Who does John love?  
b. [<sub>CP</sub> who<sub>1</sub> does [<sub>IP</sub> John love t<sub>1</sub> ]]

In (19b), the wh word who in COMP is considered as a wh operator and binds its trace, taking scope over the entire clause. In (19b), the wh operator holds scope over all the nodes which it c-commands, that is, the IP and all the nodes dominated by that node, including the trace of who. Given this LF structure (which happens to be identical to the S-structure configuration in this case), the scope of who coincides with its c-command domain. (In addition to the notion of scope, it should also be noticed that this configuration is considered as containing a well-formed operator-variable format, since the trace legitimately lies within the scope of the coindexed wh phrase, satisfying the Scope Condition.<sup>2</sup>)

-----  
2. There are two other important conditions placed on a quantified structure like (19b); one is the 'no free variable' condition and the other 'no vacuous quantification'

In English, the chief move  $\alpha$  rule figuring in the mapping of S-structure onto LF is the rule called 'Quantifier Raising' (QR) and QR transforms a quantified sentence like (20a) into an LF representation like (20b):

(20) a. John loves everyone.

b. [<sub>IP</sub> everyone<sub>i</sub> [<sub>IP</sub> John loves t<sub>i</sub> ]]

In (20b), everyone is moved to the front of the clause and holds scope over the entire clause at LF. One motivation for positing the LF structure in (20b) for (20a) is that we need to ensure that the scope of quantifiers and operators of various kinds, which seems to conform to various syntactic constraints, is explicitly represented in the logical syntax, and that the scope of these quantified expressions is treated within the confines of syntax.

In most cases, LF representations, which are derived by applications of QR etc., directly feed into their semantic interpretations, but we must point out here that there are nevertheless some cases in which the scope relations of quantifiers cannot be fixed by the structural hierarchy of the operators alone. The following is the representative example of this sort:

-----  
condition. Both conditions are legitimately fulfilled in the LF structure in (19b).

(21) Everyone loves someone.

Example (21) is ambiguous with either everyone or someone enjoying broad scope over the other. Here, we assume, with May (1985), that the interpretive effect of relative quantifier dependency apparent in (21) is generated not by having two discrete representations of the logical syntax, but rather as a result of its having an LF structure like (22), which is derived via the repeated applications of QR:<sup>3</sup>

-----  
3. At least two different views are advanced in the literature to account for the ambiguity of a multiply quantified sentence like (21). May (1977), Hornstein (1984) etc., on the one hand, argue the ambiguity of the sentence in (21a) with regard to someone and everyone results from free and unordered applications of QR, which yield the following two LF representations:

- (i) a. [<sub>IP</sub> someone<sub>1</sub> [<sub>IP</sub> everyone<sub>3</sub> [<sub>IP</sub> t<sub>1</sub> loves t<sub>3</sub> ]]]  
b. [<sub>IP</sub> everyone<sub>3</sub> [<sub>IP</sub> someone<sub>1</sub> [<sub>IP</sub> t<sub>1</sub> loves t<sub>3</sub> ]]]

May (1985), on the other hand, argues that the scope ambiguity is derived from the following LF configuration:

- (ii) [<sub>IP</sub> everyone<sub>3</sub> [<sub>IP</sub> someone<sub>1</sub> [<sub>IP</sub> t<sub>1</sub> loves t<sub>3</sub> ]]]

The crucial difference between the two accounts is that whereas the scope ambiguity of the sentence is directly represented in the LF structures in May (1977), Hornstein (1984) etc., May (1985) maintains that the scope ambiguity comes from the unique LF representation in (ii) mediated by the Scope Principle. In the second analysis, the LF construal (ia) is not available as a legitimate LF structure, since QR is, under this view, constrained by the Path Containment Condition (PCC), which prohibits the paths of quantifiers from intersecting. If we follow this analysis, (ia) is ruled out by virtue of the fact that the two paths of the quantified expressions are crossed. Since this analysis is more constrained than the first analysis, we will adopt the second view in this thesis.



(22) [<sub>CP</sub> [<sub>IP</sub> someone<sub>i</sub> [<sub>IP</sub> everyone<sub>j</sub> [<sub>IP</sub> t<sub>j</sub> loves t<sub>i</sub> ]]]]

As is obvious, the LF structure does not explain the (relative) scope status of the two quantifiers someone and everyone. The LF structure does not represent all the right scope orders which are available for the quantifiers in (21), neither someone nor everyone c-commanding the other at LF; these two quantifiers are associated with a mutual c-command relation (by the definition of 'exclusion'), since the top-most CP is the sole maximal projection dominating both someone and everyone.

A glance at the putative LF structure shows that the relative scope dependency of these two quantifiers is not fixed by the LF configuration alone, and in this case, the LF construal is subject to the Scope Principle, which May (1985) claims to allow quantifiers to hold any logically possible scope relations (with certain structural qualifications). In the LF construal in (22), for instance, the two quantifiers are regarded as constituting a  $\Sigma$  sequence by holding a c-command relation with each other, and according to May (1985), it is on this configuration that the Scope Principle legitimately applies.<sup>4</sup> On account of the Scope Principle, then, the sentence is compatible with the semantic inter-

-----  
4. Roughly speaking, quantifiers are claimed to form a  $\Sigma$  sequence if there is no maximal projection between the quantifiers in the configuration after the applications of QR at the LF level.

pretations in which either everyone or someone hold scope over the other. (Needless to say, if quantifiers do not form a  $\Sigma$  sequence, then the Scope Principle is inapplicable, and hence their scope relations are solely determined by the structural dependency of the quantified expressions at the level of LF.)

One of the most salient aspects of the LF level is that the basic scope relations are determined at this level, and this determination seems to be typically made by the format of an operator-variable structure. As we will discuss shortly, when we take into consideration the way in which our analysis encodes scope into a quantified expression, we see that there is a radical difference that distinguishes our analysis to be developed here from a general approach of the standard analysis with regard to the treatment of variables. While variables are, roughly speaking, defined as empty NP categories, which are coindexed with operators by virtue of some movement rules, especially, within the framework of EST (Extended Standard Theory) (cf. Chomsky (1981)), our analysis does not preclude the possibility that some lexical categories are directly translated into variables (without recourse to movement), and in fact, we make crucial use of the notion that some lexical categories are allowed to serve as variables in the discussion of this thesis.

As far as I can see, the discrepancy between the two analyses in this regard seems to be rather superficial in

that the standard framework simply stipulates that variables are limited to empty categories (created by movement rules), while our analysis eliminates this stipulation.<sup>5</sup> Our basic assumption is that the identification of variables is made in the following way. (The treatment happens to be the same as that of the standard account):

- (23)  $\alpha$  is a variable iff (a) it is locally A-bar bound, and  
(b) it is in an A position.

Here, the notion of binding is defined in the following:

- (24) X binds Y iff (a) X c-commands Y, and  
(b) X and Y are coindexed.

- (25) X locally binds Y iff (a) X binds Y, and  
(b) if Z binds Y, then Z also binds X or Z=X

In our analysis, as opposed to the standard analysis, we postulate that any NP categories are capable of serving as variables, provided that it is possible for them to be assigned values from the domain of individuals available in a context, instead of having a unique, fixed referent. In essence, what we claim here is that insofar as they are capable of ranging

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5. Presumably, bound pronouns are exceptions to this generalization. (cf. Chomsky (1981))

over possible values in the set of individuals, these classes of nominal expressions are, in principle, allowed to function as variables. The treatment of variables on our approach, in this sense, differs from the standardly adopted analysis, but since variables are expressions which denote individuals under an assignment of values to the variables, there is nothing wrong on empirical grounds to assume that some overt lexical items may serve as variables as long as they are interpretable through an assignment of values.

As a next point, I would like to present a speculation as to why quantifiers and wh phrases are subject to 'quantifier' type movement rules. In association with this point, we first assume that referential expressions and quantificational (i.e. non-referential) expressions constitute a basic distinction in semantic type, and the quantificational expressions, but not referential expressions, are subject to 'quantifier' rules. Given the assumption that nominal expressions of the latter type, i.e. quantified phrases, do not count themselves as arguments of predicates, movement of quantified phrases at LF (and sometimes at S-structure) is shown to follow as a consequence of the requirement of the  $\theta$  criterion, which conditions the structural manifestation of an argument structure in terms of  $\theta$  roles.<sup>6</sup> Under our view, since non-referential expressions are not regarded as

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6. To my knowledge, this line of reasoning is first suggested by May (1985).

legitimate  $\theta$  role bearers, such expressions must be moved out of their argument positions leaving traces (by the output of LF) in order to fulfill the requirement of the  $\theta$  criterion, as in (26):

- (26) a. [<sub>CP</sub> who<sub>i</sub> [<sub>IP</sub> t<sub>i</sub> loves John ]]  
b. [<sub>IP</sub> everyone<sub>i</sub> [<sub>IP</sub> t<sub>i</sub> loves John ]]

By hypothesis, traces can stand as arguments of predicates, so that LF structures found such as in (26) can be legitimized by the  $\theta$  criterion at the LF level. In fact, in the analysis in which movement of quantified expressions is conditioned by the  $\theta$  criterion, the  $\theta$  criterion makes LF movement of quantified phrases mandatory, although the rule may apply optionally. It should be remembered here that obtaining the desired result rests on the assumption that quantified phrases are properly interpreted as operators in non-argument positions and that traces are able to bear semantic roles in argument positions.

Finally, it should be noted that in this thesis, two different kinds of quantified expressions which we assume to undergo movement by 'quantifier' rules will be discussed. These two kinds of quantified phrases, viz. ordinary quantifiers and wh phrases, are known to behave differently in one important respect: Since QR, which moves ordinary quantifiers, is held to be a clause-bound operation, ordinary

quantifiers are only moved to the most proximate IP node, (or some other maximal projection within a minimal clause containing it).<sup>7</sup> In comparison to this, the scope of a wh phrase may extend far beyond the clause in which it originates, and it is essentially unbounded. Because of its unbounded nature of Wh movement, the scope domain of a wh phrase appears to be indicated by a scope marker. On the basis of this fact, we assume that wh phrases are, in unmarked cases, required to move into the scope position, which is marked by a scope marker (typically by a Q element), so as to get licensed (under the structural condition of government) at the level of LF. (Under this view, Wh movement is enforced as a requirement of government with a scope marker and this can be viewed as an instance of SPEC-head agreement, which is often discussed in the literature.) The government requirement of the construal of a wh phrase with a scope marker (or a Q element), along with the Scope Condition, enables us to accommodate the full range of relevant phenomena pertaining to wh interrogation in a natural way.

#### 1.4. Outline of the Thesis

This thesis is organized in the following way. First of all, in Chapter 2, we examine the nature of wh-in-situ which

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7. QR is clause-bound at least in a finite clause. For a detailed discussion, see May (1985).

appear in English multiple wh questions. It is well observed that the scope of wh-in-situ is immune to Subjacency effects, so that it is often claimed that movement of wh phrases in LF is not constrained by Subjacency. But this chapter argues that English, which has overt Wh movement in syntax, does not have the LF version of Wh movement, contrary to what is commonly assumed in the literature. It is then argued that the general lack of Subjacency effects in the hypothesized LF Wh movement comes from the fact that no Wh movement is instantiated in the LF component in the case of English. In this connection, we will argue further that the scope of wh-in-situ are assigned by means of unselective binding rather than Wh movement.

In Chapter 3, we will present an argument that languages like Sinhalese, Japanese, etc., where there is no syntactic Wh raising, do implement Wh movement in the LF component. It is shown, primarily based on data from Sinhalese, that although island effects are in most cases invisible in LF Wh movement, Subjacency is, contrary to appearances, a vital constraint on LF Wh movement, and that the apparent lack of Subjacency effects is a consequence of the fact that an extreme case of pied piping is available in the case of LF Wh raising.

In Chapter 4, we will turn to the two kinds of concessive clauses in Sinhalese and show that the apparent unbounded nature of a wh phrase embedded in a concessive clause

results from the fact that the wh phrase is coindexed with the Q element which heads the concessive clause, after the LF operation of Wh movement into the specifier position of the concessive clause. Furthermore, making crucial use of the concessive clauses in Sinhalese, we will provide a further confirmation for the analysis to state that Subjacency is a structural constraint imposed on LF Wh movement, and argue that pied piping is invoked even in a concessive clause if a wh phrase is embedded inside an island.

The analysis advanced in this thesis raises the question of whether a wh phrase which appears within a syntactic island gets moved in order to be licensed by a Q element in LF. Chapter 5 is devoted to providing an answer to the question by using the concessive construction in Japanese. In this chapter, mainly based on the distribution of a zero pronoun serving as a bound variable, we will argue that when a wh phrase embedded in an island pied pipes the island, a Q element can govern only the entire island, (but not the wh phrase).

In Chapter 6, in order to provide a confirmation for our proposed analysis, we will take a look at the distribution of an overt pronoun like sore and a zero pronoun, which seemingly behave like bound variables. In this chapter, it will be argued, basing our discussion on LF reconstruction effects, that while a zero pronoun is allowed to serve as a bound variable, an overt pronoun like sore does not have the



properties of a bound variable. In conjunction with this point, we will further examine the relation between the extractability of a wh phrase and the deletability of a lexical complementizer that is pertinent to bridge and non-bridge verbs.

## CHAPTER 2

### UNSELECTIVE BINDING AND MULTIPLE WH QUESTIONS

#### 2.1. Introduction

In the standard framework of generative grammar, it is generally assumed that Wh movement can take place both in the syntax and in the LF component, so that their scope can be properly represented by the output of LF. Under the standard account, there is assumed to be some parametric variation across languages in the way the rule of move 'wh' applies. In a language like English, wh phrases are moved in syntax, i.e. in the mapping of D-structure onto S-structure, and in the Chinese-Japanese type languages, wh phrases are assumed to move to the clause boundary of the sentence in the mapping of S-structure onto LF.

The approach pursued in the Principles-and-Parameters framework also assumes that Wh movement may take place in different domains of the grammar, namely, S-structure and LF, even in a language like English. In the case of English, however, it is widely known that wh phrases which are left in place sharply contrast with those moved in syntax with regard to their scope behavior. If it is assumed, as is often the case, that Universal Grammar includes LF as one of the core

'syntactic' levels of representation, it is naturally anticipated that LF movements should be constrained by the same conditions or principles constraining S-structure movements, but as far as Wh movement is concerned, it is clearly not the case. Then, a question immediately arises as to why it is that Wh movement should be invoked under different conditions, depending on the domain of the grammar where the rule of move 'wh' applies.

Our major concern of the present chapter is to provide partial answers to this question, and this chapter, in particular, presents some arguments in support of the view that treating the scope of wh-in-situ by means of LF Wh movement demands a complication in the overall organization of the grammar, so that movement must be dissociated from the scope of wh-in-situ. To be a little more concrete, what we will propose in this chapter is that wh-in-situ are assigned scope by virtue of unselective binding rather than Wh raising, and that a clear distinction must be drawn between two classes of wh phrases, one which serves as a quantifier and the other as a bound variable. In this association, it will also be claimed that, since wh-in-situ are assigned scope by virtue of unselective binding without movement in our alternative model, multiple wh interrogatives are construed as having LF representations identical to S-structure configurations.

## 2.2. Unselective Binding Analysis

It is generally assumed in the literature that English, which has overt syntactic Wh movement, has instances of LF movement of wh phrases. Instances of LF Wh movement are claimed to be found in a multiple wh question like (1):

(1) What did you give to whom?

As shown in (1), English places one and only one wh word in the specifier position (SPEC) of CP at S-structure; thus, in a multiple wh question like (1), only what is moved to SPEC of CP and whom is left in situ (at S-structure). The absence of S-structure movement of whom is, by and large, due to the fact that the C-specifier position offers only a single landing site for Wh movement and that the presence of the Doubly Filled COMP filter blocks multiple fronting of wh phrases at S-structure.

Under the standard analysis, the LF movement of whom, which adjoins this wh phrase to COMP, is postulated from interpretive considerations. In (1), though the wh phrase whom is not moved at S-structure, this wh word is interpreted as having the same scope as the moved wh phrase what, which occupies the specifier position of CP at S-Structure:

(2) [<sub>CP</sub> [ whom<sub>j</sub> [ what<sub>i</sub> ] ] did [<sub>IP</sub> you give t<sub>1</sub> to t<sub>j</sub> ] ]

As both of these wh phrases are assigned the same scope domain, i.e. the sentence is understood as a double question, the wh-in-situ must be subjected to the LF derivation of Wh fronting, as represented in (2) (if we follow the line of reasoning presented by the standard approach).

While the claim that a multiple wh question must have all the wh phrases in SPEC of CP at LF is consistent with the scope interpretation of wh phrases, the theory fails to give a satisfactory account of the scope behavior of wh-in-situ at some crucial points. One of the most salient problems is, as is well known, that Wh movement is used under different conditions, depending on the component of grammar where the rule is invoked, i.e. LF and S-structure. If we hold the assumption that there is a correspondence between LF and syntax (as a unit of syntactic component), it is evident that the movement theory in which wh phrases are assigned scope solely by means of Wh movement demands a complication in analysis in that LF Wh movement must somehow be distinguished from S-structure Wh movement (even though they are the same movement rules). An important question, then, arises as to why there is an asymmetry between LF and S-structure with respect to Wh movement. This problem is by no means trivial; unless there is a principled explanation for the difference, the problem remains as a paradox and it eventually casts serious doubt on the analysis.

Whatever the virtue of a movement account of wh scope,

it appears somewhat odd to insist on empirical grounds that movement be the only means of scope assignment. Within the realm of generative grammar, it is generally believed that 'quasi'-quantifiers like wh phrases are assigned scope only by means of movement, but it is suggested in the literature, especially, in a Montague framework, that some quantified expressions like indefinites are directly translated into variables (without going through any 'quantifier' rules; hence without moving out of their surface positions) (cf. Heim (1982), Kamp (1982)).<sup>1</sup> As we will discuss below, this analysis has the advantage of explicating the long-standing puzzles pertaining to donkey sentences. What I am going to suggest from now on is, in fact, that this is also quite an interesting way of handling multiple wh questions, and we will argue that if this idea is extended to the cases of multiple wh questions, we can derive quite a general account of the scope phenomena concerning wh questions.

To be a little more specific, what we will propose in what follows is that wh-in-situ should be regarded as free variables due to the lack of their own quantificational force, and that they must consequently be bound by an exter-

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1. Heim's (1982) treatment of indefinites is somewhat different from ours in that her analysis assumes that indefinites are vacated from their surface positions by the rule of NP-prefixing, generally, in line with a Montague approach. The GB theory does not implement the rule of this type (N.B. the NP-prefixing rule is not a 'quantifier' rule), and so we assume that NPs remain in place if they are not affected by 'quantifier' rules.

nal binder in a higher domain. In our proposal, the relevant operator to bind the wh-in-situ, namely, an unselective binder, would be a moved wh phrase in operator position. (Hereafter, this binding relation is referred to as unselective binding.)<sup>2</sup> If we adopt the suggested analysis, we can now yield the LF construal, which is, in essence, no different from its S-structure representation, as in (3):

(3) [<sub>CP</sub> what<sub>i</sub>(<sub>3</sub>) did [<sub>IP</sub> you give t<sub>i</sub> to whom(<sub>3</sub>) ]]

In the LF structure (3), where whom remains in place even at LF, the wh phrase whom serves as a variable bound by the moved wh word what, which is an operator in A-bar position. In this case, the operator binds a multiple occurrence of variables, i.e. its trace and the wh-in-situ, and assigns scope to them. Note one distinctive feature associated with this analysis; in this analysis, wh-in-situ are assigned scope by means of unselective binding, and the scope of wh-in-situ is dissociated from Wh movement. In this analysis, since Wh movement is irrelevant to the scope of wh-in-situ, it is naturally predicted that wh-in-situ show properties

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 2. The term 'unselective' is due to Lewis (1975). Unselective binding is a mechanism which allows an operator to bind a multiple occurrence of lexical variables and assign scope to each variable without movement. In this thesis, indices in parenthesis indicate that operator-variable relations are established by means of unselective binding. (cf. Heim (1982), Pesetsky (1987), Nishigauchi (1986, 1990) etc.)

distinct from those exhibited by moved wh phrases.

Even if we wished to treat all wh phrases in a unitary manner as quantifiers, but not as variables, we could account for the scope phenomena of wh questions, but in this analysis, the discrepancy between syntax and LF would remain basically inexplicable. In opposition to this, once we grant the possibility that some wh phrases are directly translated into variables, a fairly straightforward syntactic apparatus to the problem of the LF-syntax asymmetry is available within the current assumptions of the Principles-and-Parameters approach, and a more attractive alternative presents itself.

It is no doubt that moved wh phrases are assigned scope by means of movement, but wh-in-situ, whose behavior sharply contrasts with that of moved wh phrases, seem to present properties which crucially differ from what is allowed for movement. What we claim in this chapter is, in effect, that our alternative model is indeed viable and that if the scope of wh-in-situ is derived from a principle independent of Wh movement, then quite a general account of scope phenomena involving multiple wh questions is attained and we are able to account for the LF-syntax asymmetries pertaining to Wh movement at no extra theoretical cost. In what follows, it will be demonstrated that the unselective binding analysis is indeed preferable to the standard 'movement' analysis in several respects. Since it is the locus of debate whether wh-in-situ in English undergoes movement or not, our atten-



tion is naturally confined to the problems associated with multiple wh questions in English.

### 2.3. Indefinites and the Donkey Anaphora

Prior to the discussion of multiple wh questions, let us for the moment consider some of the characteristics of unselective binding, which we will assume to be another instance of scope-assigning device, different from QR or Wh raising. The basic conceptual background of unselective binding can be drawn from the discussion of indefinites by Heim (1982), although the theory will be presented somewhat differently from what is outlined in Heim (1982) in order to transpose the notion into the current framework.

The analysis that Heim (1982) has proposed concerns the peculiar properties of the so-called 'donkey' sentences. The analysis is primarily based on Heim's observation that the quantificational character of an indefinite may differ depending on the kind of quantifier (or adverb of quantification) which happens to appear in a higher domain. Heim's proposal is that indefinites do not have any inherent quantificational force of their own and that they are, rather, construed as variables to be bound by an independent quantifier (or an adverb of quantification).

One of the contexts in which the puzzles of indefinites surface is that of donkey-anaphora, where an indefinite is

deeply embedded in the scope of a quantifier. First, consider the following example, which is commonly referred to as a 'donkey' sentence:

- (4) a. Every man who owns a donkey<sub>i</sub> beats it<sub>i</sub>.  
b. If a man<sub>i</sub> owns a donkey<sub>j</sub>, he<sub>i</sub> always beats it<sub>j</sub>.

In (4), both sentences have an interpretation in which more than one donkey is being discussed, viz. one donkey per owner, the 'donkey' phrase being understood as within the scope of the universal quantifier.<sup>3</sup> What is particularly of interest in these sentences is the fact that whereas the indefinite phrases are embedded in the relative clause or in the if-clause, the pronouns, which are in the matrix clause, can be bound by the indefinite noun phrases.

In general, in a construction where a pronoun is understood as a bound variable of a certain quantifier, the quantifier is required to c-command the pronoun, as shown in (5):<sup>4</sup>

- (5) a. Everyone<sub>i</sub> believes that his<sub>i</sub> wife is adorable.  
b. Everyone<sub>i</sub> sat down after he<sub>i</sub> walked in.

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3. Throughout the discussion, irrelevant interpretations are ignored.

4. See Lasnik (1976), Higginbotham (1980, 1985), Evans (1980), etc. for discussions on this point.

If the quantifier fails to c-command the pronoun, then the pronoun cannot be coindexed with the quantifier, as illustrated in (6):

- (6) a. \*He<sub>1</sub> thinks that everyone<sub>1</sub> is intelligent.  
b. \*After he<sub>1</sub> walked in, everyone<sub>1</sub> sat down.

This shows that for a pronoun to be understood as a bound variable, it is necessary for a quantifier to have a c-command relation with the pronoun. If it is generally the case, then the donkey sentences in (4) pose some problems on the theory of binding, because the pronouns in (4) are interpreted as bound variables of the indefinites, despite the fact that the pronouns are not c-commanded by their antecedents. The crucial question with sentences like (4) is, then, how to deal with the fact that the 'donkey' phrase can bind a pronoun outside its apparent scope, without the structural constraint of 'c-command'.

There appear to be several possible approaches to solving the paradox. But what has led Heim (1982) to employ the idea of indefinites as bound variables is the observation that a quantifier (or an adverb of quantification) contributes to defining the quantificational character of an indefinite. Consider the following:

- (7) a. If a man owns a donkey, he always beats it.
- b. In most cases, if a table has lasted for fifty years, it will last another fifty.
- c. Sometimes, if a cat falls from the fifth floor, it survives.
- d. If a person falls from the fifth floor, he or she will very rarely survive.

In the examples above, the quantificational force of the indefinites changes widely, depending on their varying environments, as their paraphrases clearly illustrate:

- (8) a. For every man and every donkey such that the former owns the latter, he beats it.
- b. Most tables that have lasted for fifty years last for another fifty.
- c. Some cats that fall from the fifth floor survive.
- d. Very few people that fall from the fifth floor survive.

The paraphrases indicate that the choice of value for the 'donkey' phrase varies with the choice of value for a quantifier: With regard to the meaning of an indefinite in a donkey-type sentence, we observe that there is universal quantification over an indefinite in the context of always, and the indefinite assumes an existential quantificational

force under the context of sometimes. If an indefinite appears in the environment of in most cases and very rarely, its quantificational force turns out to be "most" and "very few", respectively.

Heim (1982) captures this property of indefinites by assuming that they behave as variables to be bound by a quantifier in a higher domain. According to her analysis, quantifiers or adverbs of quantification unselectively bind the indefinites which serve as variables lacking inherent quantificational forces, and they assign their quantificational force to these indefinites, which would otherwise be left unbound. In her theory, thus, (9a) and (9b) are assumed to have a logical representation like (9c):

- (9) a. Every man who owns a donkey beats it.  
b. If a man owns a donkey, he always beats it.  
c.  $\forall x,y[[ \text{man}(x) \ \& \ \text{donkey}(y) \ \& \ \text{owns}(x,y) ]$   
     $\rightarrow \text{beats}(x,y) ]$

With regard to the logical representation in (9c), it should be noted that the pronouns which serve as (lexical) variables of the indefinites are construed within the nuclear scope of its binder, namely, the universal quantifier, as is required, so that we can obtain the correct interpretation for the donkey sentences.<sup>5</sup>

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5. I assume that the (quantificational) logical formula,

Heim's treatment of an indefinite as lacking an inherent quantificational force, at first blush, seems to be counter-exemplified by the examples in (10):

(10) a. A dog walked.

b. If a donkey kicks John, he beats it.

Unlike the examples in (7) and (9), neither of the sentences in (10) contain an overt unselective binder, either an quantifier or an adverb of quantification. However, the indefinite in (10a) is unambiguously read existentially, and the indefinite in (10b) seems to have a universal quantificational force.

A complete discussion of these sorts of sentences takes us afield from the topic at hand, but a few brief remarks are in order at this point. In the case of (10a), the rule

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which is distinct from logical syntax, consists of three components, viz. operator, restrictor and matrix, and makes up a tripartite structure like (i):

(i)           ┌──────────┐  
              |          |  
              └──────────┘  
          OPERATOR  RESTRICTOR  MATRIX

In the tripartite structure, what occupies the operator position is an operator such as determiners (e.g. every), adverbs of quantification (e.g. always) and modals (e.g. must). The restrictor is sometimes called a restrictive clause, and puts certain limitations on the range of quantification which individuals quantify over. The restrictive clause is typically represented by an if-clause or a relative clause. The matrix is the scope domain over which the operator can have scope, and it is sometimes referred to as a nuclear scope.

called Existential Closure is held responsible for the (existential) interpretation of the indefinite. Roughly speaking, Existential Closure is a rule that inserts an existential unselective binder into the nuclear scope of the sentence (or into the top of a sequence of sentences).<sup>6</sup> If this rule applies under appropriate grammatical environments, then the indefinite can be bound by an existential binder, and this type of binding yields an existential reading for the indefinite. The binding of an indefinite NP by means of the subrule of Existential Closure is, of course, a default case, since this kind of binding does not take effect in the context in which overt operators are available.

Much more problematic is the sentence in (10b). The indefinite in (10b) has an universal import, yet the sentence contains no obvious candidate for a universal quantifier, which assigns a universal quantificational force. In order to account for an example like (10b), Heim (1982) postulates the existence of an invisible contributor of a universal quantificational force, independently of the semantics of the indefinite. Her hypotheses are as follows; first, a 'bare' conditional (one which contains no overt operator for the if-clause to restrict) expresses a form of conditional necessity involving a covert necessity operator, roughly equivalent to generally or always, with the 'then' clause read as under the

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6. For details, see Heim (1982).

scope of the invisible-necessity operator; second, the invisible-necessity operator is, basically, an unselective binder, which may bind any number of variables. The combination of these two hypotheses leads to expect that an indefinite may get bound by the necessity operator which is a part of the 'bare' conditional. Since the necessity operator is essentially universal in its quantificational force, an indefinite bound by the necessity operator, then, can be assumed to acquire a universal quantificational force.

If Heim's treatment of the interpretation of indefinites is correct, then the analysis leads to the strong claim that no indefinite ever has any quantificational force of its own, and what appears to be a quantifying reading of an indefinite is always the result of the indefinite's getting bound by an independent quantifier. The details of the system of quantification supplementing the variable analysis of indefinites is, however, not of much concern to us; for our present purposes, it suffices to observe that, in Heim's system, indefinites are treated as variables to be bound by an external binder, and that the external binder, being unselective, determines the quantificational force of the indefinites.

Be that as it may, notice that Heim's insight of treating indefinites as variables, which may get bound by an independent quantifier, is quite readily amenable to the current assumptions in generative grammar. In generative grammar, it can be assumed that in an example like (11), the adverb of



quantification is raised to the most proximate IP node by a syntactic operation of QR in much the same way as ordinary quantifiers:

(11) If a man owns a donkey, he always hates it.

Granted that the adverb of quantification always can unselectively bind the indefinites in the restrictive clause, an intermediate logical representation of a sentence like (11) will be given as in the form in (12):

(12) [<sub>IP</sub> Always<sub>k(i)(j)</sub> [<sub>IP</sub> [<sub>CP</sub> if a man<sub>(i)</sub> owns a donkey<sub>(j)</sub> ]  
he<sub>(i)</sub> t<sub>k</sub> hates it<sub>(j)</sub> ]]

The availability of donkey anaphora in (11) follows directly from the logical syntax of (12). In the LF representation of the sentence, the adverbial always, which serves as an unselective binder, c-commands both the antecedent indefinites and the bound pronouns.<sup>7</sup> Since the adverbial operator stands in a c-command relation with the indefinite NPs, the adverbial is allowed to bind the indefinites in unselective fashion. What is more, in this construal, the pronouns located inside the main clause are also c-commanded by the sen-

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7. I assume that the bound variable interpretations of the pronouns depend on the LF representation, rather than the S-structure representation. This is equivalent to stating that their reference is fixed by referring to S-structure traces.

tential operator always. Therefore, the pronouns can be coindexed with the indefinite NPs as bound variables by virtue of the presence of the unselective binder always, which c-commands the pronouns.

In exactly the same vein, an indefinite which is embedded in a relative clause can be unselectively bound by whatever operator there is to bind it. In this type of construal, the relevant unselective binder turns out to be the head noun of the relative clause that contains an indefinite:

(13) a. Every man who owns a donkey likes it.

b. [IP [NP every man<sub>i(j)</sub>] [CP who<sub>i(j)</sub>] [ t<sub>i</sub> owns a donkey<sub>(j)</sub> ]]]<sub>i(j)</sub> [IP t<sub>i</sub> likes it<sub>(j)</sub> ]]

The availability of a donkey interpretation in (13a) can be readily captured if the head of the relative clause is thought to serve as an unselective binder and the relative clause, as the whole, undergoes movement by QR at the LF level, as shown in (13b). In (13b), the wh operator who forming a part of the relative clause is, uncontroversially, coindexed with the head of the relative clause, i.e. every man, and so the wh operator who receives the same index as every man. As the wh operator c-commands the 'donkey' phrase, the relative head can unselectively bind the 'donkey' phrase. This logical syntax also allows the pronoun to be c-commanded by the entire relative clause (cf. Haik (1984)).

Given the assumption that the entire relative clause bears the selection indices of its head, the pronoun in the matrix clause can be coindexed with the 'donkey' phrase, since the pronoun in question eventually falls under the scope of the unselective binder every man, as represented in (13b).

The major insight of this analysis is derived from the fact that the coindexing relation between an indefinite and its dependent pronoun found in a donkey sentence is based on the c-command relation that holds between an unselective binder (or more generally, an operator) and the pronoun. As is expected, if this c-command relation fails to hold, the sentence is excluded as a donkey sentence, as exemplified in (14) (cf. Hařk (1984)):

- (14) a. \*Every man who owns a donkey<sub>i</sub> came and Mary kicked it<sub>i</sub>.
- b. \*Shouting at some people who owned a donkey<sub>i</sub> frightened it<sub>i</sub>.
- c. \*Mary kissed two men who bought a donkey<sub>i</sub> because she found it<sub>i</sub> cute.

These sentences are excluded as donkey sentences because the pronoun is not c-commanded by the quantifier which c-commands the indefinite, resulting in a failure to obtain the donkey interpretation. In short, the scope of the 'donkey' phrase is determined not by the c-command domain of the 'donkey'

phrase but by the c-command domain of an unselective binder which binds the 'donkey' phrase.

Alternatively, it might be argued that the 'donkey' phrases are assigned scope by QR, assuming that indefinites are existential quantifiers which are susceptible to QR just as with quantifiers like everyone. This is in accord with the traditional view of indefinites, but there are several empirical difficulties with such an account. First, this account has to make a crucial use of extraction of the 'donkey' phrase out of a relative clause in order to explicate the fact that the pronoun can be bound by the 'donkey' phrase:

(15) [<sub>IP</sub> [<sub>NP</sub> a donkey<sub>1</sub> [<sub>NP</sub> every man<sub>3</sub> who owns t<sub>1</sub> ]]<sub>3</sub> [<sub>IP</sub> t<sub>3</sub> beats it ]]

Given this logical representation, the pronoun is interpretable as lying within the scope of the embedded 'donkey' phrase. However, the logical syntax does not represent the interpretation which the donkey sentence possesses. In this representation, the 'donkey' phrase must carry an 'inversely linked' reading on which the 'donkey' phrase takes scope over every man, but the actual interpretation is different in that the universal quantifier is taken to have broader scope than the indefinite, as in (16a) or (16b), not (16c):<sup>8</sup>

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8. Putting aside some minor details irrelevant to the present discussion, we will, quite roughly, consider (16a) as having truth conditions virtually identical to (16b).

- (16) a.  $\forall x,y[[ \text{man}(x) \ \& \ \text{donkey}(y) \ \& \ \text{own}(x,y) ] \rightarrow$   
 $\text{beat}(x,y) ]$
- b.  $\forall x[ \text{man}(x) \rightarrow \exists y[ \text{donkey}(y) \ \& \ [ \text{own}(x,y) \rightarrow$   
 $\text{beat}(x,y) ] ] ]$
- c.  $\exists y[ \text{donkey}(y) \ \& \ \forall x[ \text{man}(x) \rightarrow [ \text{own}(x,y) \rightarrow$   
 $\text{beat}(x,y) ] ] ]$

Second, the outcome of the syntactic operation of QR causes a violation of Subjacency. Since QR is subject to Subjacency, which restricts movement within a minimal clause, QR should not extract the 'donkey' phrase out of the relative clause. The only structure which can be derived by QR, then, should be the LF structure in (17):

- (17)  $[_{IP} [_{NP} \text{every man}_j [_{CP} \text{who}_j [_{IP} \text{a donkey}_i [_{IP} t_j$   
 $\text{owns } t_i ] ] ] ] ]_j [_{IP} t_j \text{ beats it } ] ]$

The point here is that Subjacency prohibits quantifiers from being extracted from islands, so that the LF construal in (15) is simply not derivable. In addition, if an indefinite were extracted by QR, we could not easily explain why other quantifiers obey the island conditions, as shown in (18):

- (18) a. \*Every man who owns no donkey<sub>i</sub> beats it<sub>i</sub>.
- b. \*A man who owns every donkey<sub>i</sub> beats it<sub>i</sub>.

It can be readily confirmed that an ordinary quantifier like no donkey or every donkey, which we claim to be subject to QR, cannot extend their scope over the main clause and its scope is restricted within the relative clause, because the quantifier cannot be coindexed with the pronoun which resides in the matrix clause. The crucial point is that the indefinites behave quite differently from ordinary quantifiers with regard to the scope island constraint. On the face of it, it should be reasonable, on empirical grounds, to conclude that the scope of the 'donkey' phrase is not determined by QR.

There is still another possibility of dealing with donkey sentences within the assumptions of generative grammar. One might claim that the 'donkey' phrase should be analyzed as an R-expression just like a proper name. Since an R-expression is subject to Condition C of the Binding Theory, it should be possible that the pronoun, which does not stand in a c-command relation with the 'donkey' phrase, can be coindexed with the 'donkey' phrase. However, there are some problems with such an account as well. To take an example, consider the following:

- (19) a. Every man who owns a donkey<sub>i</sub> beats it<sub>i</sub>.  
b. Every man who hates that donkey<sub>i</sub> beats it<sub>i</sub>.

Example (19b) minimally differs from (19a) in that only a donkey is replaced with that donkey, and it appears as though the pronoun it were coindexed with that donkey in (19b) in an analogous way as that of (19a). On closer inspection, however, it proves that this is not the case. First, notice the fact that that donkey, in opposition to the indefinite a donkey, is an R-expression, which does not form an operator-variable structure by QR. This can be confirmed by the fact that this type of NP does not have scope interaction with other quantified expressions:

- (20) a. Every man loves some woman.  
b. Every man loves that woman.

Unlike (20a), (20b) is not ambiguous, and it has the only interpretation on which there is a single woman that every man loves. If that woman in (20b) were moved by QR, we would expect that the sentence displays ambiguity with respect to the scope of every man and that woman, but this prediction is not borne out. The absence of scope interaction for the phrase that woman strongly suggests the correctness of the assumption that that woman is not moved by QR at all. If this is correct, (20b) must have the LF structure shown in (21):

- (21) [<sub>IP</sub> every man<sub>i</sub> [<sub>IP</sub> t<sub>i</sub> loves that woman ]]

As far as the interpretation of name-like expressions such as that woman or proper names are concerned, they are characterized as having (interpretively) the widest possible scope in relation to quantified expressions which get moved by QR in LF.<sup>9</sup> In fact, that donkey in (19b), which is considered as an R-expression, is interpretively understood as taking broader scope than the universal quantifier, and its coindexing possibilities readily extend beyond the clause in which it resides. Needless to say, these are both in full conformity with the assumption that that donkey is an R-expression.

This analysis of the NP that donkey, however, cannot be carried over to the 'donkey' sentence in (19a). In the case of (19a), though the scope of the indefinite may exceed beyond the if-clause, (i.e. the binding property of the indefinite is similar to that of an R-expression in the sense that its scope is not confined to a minimal clause within which it is contained), the 'donkey' phrase is understood as having narrower scope than the universal quantifier on the

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9. To be precise, it does not stand to reason to talk about the scope of a nominal expression which does not form an operator-variable structure at the LF level. But the point should be clear, because an R-expression like that woman is always understood to be unique relative to a universally quantified expression like everyone. The term is meant to indicate, very loosely, a particular interpretation involving that phrases, which we obtain in association with common quantifiers. To avoid unintended interpretations of the term, the expression 'interpretive' is added to the term 'scope' when we talk about the particular interpretation concerning that phrase (or an R-expression) in relation to ordinary quantifiers.



donkey interpretation. This will be in contradiction with the hypothesis that the 'donkey' phrase is an R-expression, since the 'donkey' phrase, if the assumption were correct, would be understood to take wide scope with respect to the universal quantifier every man. Viewed in this way, it should be apparent that the indefinite NP a donkey can in no way be regarded as an R-expression (at least in the donkey context).

In addition, there is another piece of solid evidence which runs counter to the stipulation that the 'donkey' phrase is an R-expression. If the 'donkey' phrase is thought to be an R-expression, we do not have a principled explanation for the contrast in the possibility of coindexing which obtains between the two types of sentences below:

- (22) a. \*If John likes every farmer who owns a donkey<sub>i</sub>, he will feed it<sub>i</sub>.
- b. If John admires every farmer who likes that donkey<sub>i</sub>, he will feed it<sub>i</sub>.

In the (b) example of (22), the pronoun it can be coindexed with the 'donkey' phrase. This is what is expected from the Binding Theory, because a pronoun may be coreferential with an R-expression which the pronoun does not c-command. By contrast, the coindexing of the 'donkey' phrase with the pronoun it is impossible on the donkey sentence in (22a). In

this case, since the pronoun it is not c-commanded by the unselective binder of the indefinite 'donkey' phrase, the pronoun cannot be coindexed with the 'donkey' phrase.<sup>10</sup>

The behavior of that donkey and a donkey diverges with respect to the coindexing possibility, as shown above. The facts in (22) indicate that the bound pronoun in (22a) is not dictated by the condition which restricts the distribution of the pronoun in (22b), and that in explaining the scope behavior of the indefinite in (22a), a somewhat broader notion of syntactic scope, namely, that of unselective binding, must be crucially utilized. Taken together, these observations show that treating an indefinite in a manner parallel to an R-expression does not suffice to account for the full range of its behavior.

In short, if the 'donkey' phrase is treated as an ordinary quantifier which is susceptible to QR, we will totally miss the generalization about the sentence-bound nature of

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 10. Hornstein (1984) explains the scope properties of donkey sentences by invoking the notion of the 'dual' structural descriptions:

- (i) a. [IP [NP everyone<sub>1</sub> [CP who<sub>1</sub> [IP a donkey<sub>j</sub> [IP t<sub>1</sub> owns t<sub>j</sub> ]]]]]<sub>1</sub> [ t<sub>1</sub> beats it<sub>j</sub> ]]  
 b. [IP [NP everyone<sub>1</sub> [CP who<sub>1</sub> [IP t<sub>1</sub> owns a donkey<sub>j</sub> ]]]]<sub>1</sub> [IP t<sub>1</sub> beats it<sub>j</sub> ]]

One type of drawback in this treatment of donkey sentences is that the analysis does not fully account for the fact that a bound pronoun must stand within the scope of the universal quantifier, as is exemplified in (19a), since the 'donkey' phrase is also treated like an R-expression with regard to pronominal binding. See also May (1985).

the scope of common quantifiers. On the other hand, if it is construed as an R-expression, we cannot account for the correlation between a wide scope interpretation and the scope island constraint. The observation strongly suggests that the interpretation of the indefinite should be approached from a totally different standpoint, and the discussion above makes it clear that the scope properties of an indefinite, which has hitherto been problematic, can be best captured by assuming that an indefinite has no quantificational force of its own and behaves as a bound variable, which is to be bound by an external quantifier.

#### 2.4. The LF Representation of Multiple Wh Questions

The foregoing observation that an indefinite exhibits a number of crucial differences that are distinguished from ordinary quantified expressions has led us to conclude that the scope of an indefinite (in a donkey context) is created by virtue of unselective binding rather than QR. In this section, we will argue that the theoretical claim advanced above on the basis of donkey sentences should be extended to the analysis of multiple wh questions. Our contention in this section is that since wh phrases diverge with respect to their scope behavior depending on whether or not they undergo movement in the syntax, we should draw a clear line between moved wh phrases and unmoved ones.

In the present section, we will propose that wh phrases should be categorized into two classes, one which serves as an ordinary quantifier and the other which serves as a bound variable. In what follows, it will be argued that moved wh phrases belong to the former class and unmoved wh phrases belong to the second class of wh phrases in English, so that a multiple wh question like (23a) has an LF structure like (23b), which happens to be identical to its S-structure configuration:

(23) a. Who read what?

b. [<sub>CP</sub> Who<sub>i(j)</sub> [<sub>IP</sub> t<sub>i</sub> read what<sub>(j)</sub> ]]

In (23b), the moved wh phrase who is viewed as an unselective binder and the wh-in-situ what as a bound variable whose scope is assigned by who under the proposed account. It will be demonstrated below that this approach has the advantage of providing a solution to the question of why wh phrases behave differently with regard to their scope, according to whether or not they undergo movement in S-structure.

In order to confirm the validity of the hypothesis that a syntactic process that is found in a donkey sentence also operates on a multiple wh question, it is necessary to show that multiple wh questions possess properties that are shared by donkey sentences. If our argument is correct, multiple wh questions exhibit certain properties that can be best

described by reference to the machinery of unselective binding. Our task now is to show that multiple wh questions display a number of crucial properties that call for an analysis which attributes the scope of wh-in-situ to unselective binding.

#### 2.4.1. Locality Requirement

A first argument is concerned with the locality requirement of the scope of wh-in-situ, contrasted with the scope of moved wh phrases. In the case of wh constructions, it is well observed that wh phrases act differently with respect to their scope, depending on the levels of representation where move 'wh' is invoked. The observation that Wh movement is subject to a number of syntactic constraints usually pertains to S-structure movement of wh phrases. The scope of wh-in-situ is, by contrast, usually immune from the island constraints and can readily extend beyond syntactic islands. The question to be asked now is how the unbounded nature of the scope of unmoved wh phrases actually obtains and how the apparent lack of island constraints is best analyzed.

To be a bit more concrete, let us consider the sentences below, by which the difference in susceptibility to Subjacency is clearly envisioned. (Examples are from Huang (1982b), Chomsky (1981, 1986a), Fiengo, Huang, Lasnik and Reinhart (1988)):

- (24) a. \*Who<sub>1</sub> do you like books that criticize t<sub>1</sub> ?  
 b. Who likes books that criticize who?
- (25) a. ?\*Who<sub>1</sub> does John believe the claim that Bill  
 saw t<sub>1</sub> ?  
 b. Who believes the claim that Bill saw who?
- (26) a. \*Who<sub>1</sub> do you think that pictures of t<sub>1</sub> are on sale?  
 b. Who thinks that pictures of who are on sale?
- (27) a. ?\*What<sub>1</sub> do you remember who bought t<sub>1</sub> ?  
 b. Who remembers who bought what?
- (28) a. \*Who<sub>1</sub> did John come back before you had a chance to  
 talk to t<sub>1</sub> ?  
 b. Who came back before you had a chance to talk to who?
- (29) a. \*What color hair<sub>1</sub> did you meet a student with t<sub>1</sub>?  
 b. Who met a student with what color hair?

Singular wh constructions in the (a) sentences illustrate the effects of Subjacency under overt Wh movement, i.e. the CNPC, the Subject Condition, and the Adjunct Condition. In contrast to this, in the corresponding multiple wh questions, the wh-in-situ occurring inside an island can be construed with a wh phrase in the matrix COMP, which is outside the island, without displaying the effect of Subjacency.

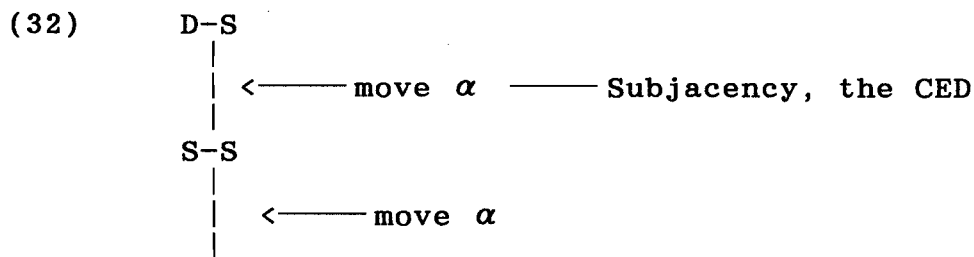
Based on these contrasts, the LF movement hypothesis, especially, Huang (1982b), claims that Subjacency (and the

CED) only constrain instances of Wh movement that apply within the syntactic component of the grammar, and that LF Wh movement is thus free from Subjacency.<sup>11</sup> In this analysis, the ECP is claimed to be the principle that constrains LF Wh movement, applying to structures after LF raising, and rules out examples like those starred below:

- (30) a. Why did you buy what?  
 b. \*What did you buy why?

- (31) a. Who bought what?  
 b. \*What did who buy?

The LF movement analysis, sometimes called the (classical) ECP analysis, thus, gives us the following overview of the system of principles that constrain Wh movement in various components of grammar:




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11. Huang's (1982b) definition on the Condition on Extraction Domain (CED) is as follows:

- (i) A phrase A may be extracted out of a domain B only if B is properly governed.

As seen from (32), the transformational rule of move  $\alpha$  takes place in the mapping from D-structure to S-structure and from S-structure to LF. The constraints that play roles in determining the well-formedness of movement are Subjacency and the CED at S-structure and the ECP at LF. Since Wh movement occurs in different components, referring to different principles, the properties of Wh movement differ accordingly, depending on the components of the grammar in which it is invoked.<sup>12</sup>

In the classical ECP analysis, which is sketched above, the well-formedness of the scope of wh-in-situ in a multiple wh question is not checked by Subjacency but is legitimized by the ECP, which requires that traces left by movement be either lexically governed or antecedent governed at LF. According to this theory, S-structure movement of a wh phrase like (33) is ruled out in violation of Subjacency, crossing two bounding nodes (two S's(=two IP's)):

(33) a. ?\*What do you remember who bought?

b. [<sub>CP</sub> what<sub>i</sub> do [<sub>IP</sub> you remember [<sub>CP</sub> who<sub>j</sub> [<sub>IP</sub> t<sub>j</sub> bought t<sub>i</sub> ]]]]

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 12. Here, I do not discuss the notion of  $\gamma$ -marking, which is presented by Lasnik and Saito (1984), since it is irrelevant for the present discussion.



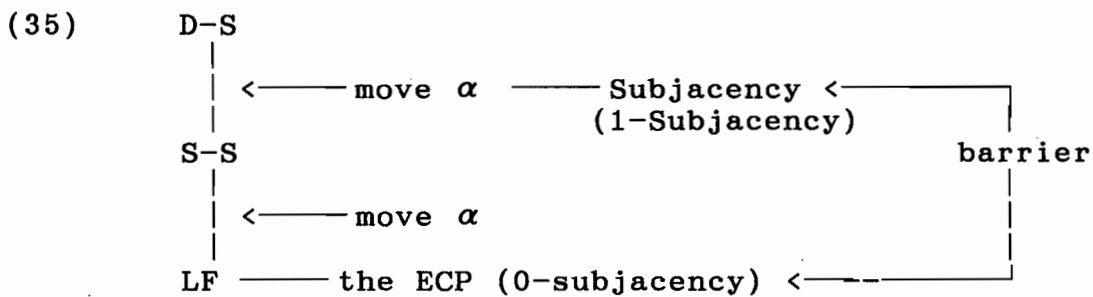
By contrast, the apparent unbounded case of wh-binding in LF, which is illustrated below, is a consequence of the ECP, which allows long distance movement of a wh phrase as long as a trace left behind is properly governed:

- (34) a. Who remembers who bought what?  
 b.  $[_{CP} [ \text{what}_j [ \text{who}_i ] ] [_{IP} t_i \text{ remembers } [_{CP} \text{who}_k [_{IP} t_k \text{ bought } t_j ] ] ] ]$

A comparison of (33b) and (34b) shows that the wh-in-situ in (34b) has the geometry of the entire movement path virtually identical to that of S-structure movement in (33b), crossing the same number of bounding nodes, but only the LF movement of the wh-in-situ is licit. Example (34a) is a case in which the scope of an unmoved wh phrase extends over a syntactic island, namely, a wh island. The relevant LF structure, which is given in (34b), is yielded by a long distant extraction of what from the wh island. Here, since Subjacency is not applicable in LF and since the initial wh trace is lexically governed by the verb saw, the long distance movement of what at LF is legitimized with respect to the ECP; thus, the sentence is claimed to be well-formed in this analysis.

The schema given above is further elaborated in Chomsky (1986b), which incorporates Huang's insight into the notion

of 'barrier'. In this system, the locality requirement for Subjacency and the ECP (antecedent government) is expressed solely in terms of 'barrier'. In this system, the notion of barrier applies both to Subjacency and to the ECP, the only difference being that the former imposes a bit looser condition on movement than the latter; the locality requirement for movement is defined in terms of the number of barriers that can intervene between a trace and its antecedent. Within this framework, the overall organization of the principles that are immediately relevant to our discussion will be represented as follows:



In the 'barrier' system, the grammatical contrast between (33a) and (34b) is expounded in a fashion similar to the classical ECP analysis. In both cases, since IP is not L-marked, the lower CP, which immediately dominates the IP, constitutes a barrier to movement (and this barrierhood is pertinent to S-structure movement). Thus the S-structure movement of what exhibits the effect of Subjacency, crossing the lower CP, which forms a barrier, as shown below:

(36) [<sub>CP</sub> what<sub>i</sub> do [<sub>IP</sub> you [<sub>VP</sub> t<sub>i</sub> [<sub>VP</sub> remember [<sub>CP</sub> who<sub>j</sub> [<sub>IP</sub> t<sub>j</sub> [<sub>VP</sub> t<sub>i</sub> [<sub>VP</sub> bought t<sub>i</sub> ]]]]]]]]]]

Note that in the barrier system, VP is also viewed as constituting a barrier to movement, but the barrierhood of VP is, according to Chomsky (1986b), nullified by way of adjunction to VP in an intermediate step of Wh fronting. In the case of wh-in-situ construction like (34a), compared to (33a), the movement of what in LF is devoid of a Subjacency effect, because the barrierhood of CP etc. only applies to S-structure movement, and then what can proceed to the COMP at the top in a single swoop:

(37) [<sub>CP</sub> [ what<sub>i</sub> [ who<sub>j</sub> ] ] [<sub>IP</sub> t<sub>j</sub> remembers [<sub>CP</sub> who<sub>k</sub> [<sub>IP</sub> t<sub>k</sub> bought t<sub>i</sub> ]]]]

In the 'barrier' theory, just as in the classical ECP analysis, the unbounded movement of what at LF in (37) is legitimized on the basis of the ECP, which requires a trace to be properly governed. Since the trace of what in (37) is lexically governed by the verb bought, what can be moved to the topmost COMP, without affecting grammaticality.

The 'barrier' system, in which Subjacency and the ECP are relegated to a single source of constraint, still appears

to have the deficiencies which are shared by Huang's proposal, although it is theoretically more attractive than the classical analysis. A potential problem with this sort of analysis is that the theory, as it stands, does not offer a well-motivated account for the fact that the same Wh movement exhibits a cluster of different properties, depending on the domain of the grammar in which it occurs. This type of analysis necessarily raises the question of what makes the syntactic and LF components different in this way. As long as wh phrases are assumed to receive scope solely by means of Wh movement, it is necessary to assume that LF movement is (somehow) exempt from Subjacency, in order to account for the absence of Subjacency effects at the level of LF.

However, this is clearly an undesirable conclusion in view of the fact that while Subjacency is not observed by LF movement of wh phrases, QR (Quantifier Raising), which is another instance of move  $\alpha$  in LF, respects Subjacency. The fact that QR is a clause-bound operation, i.e. QR adjoins quantified expressions to the most proximate IP, and that the operation of QR conforms to the Subjacency condition can be confirmed by the following examples:

- (38) a. Someone loves everyone.  
      b. Someone believes that Bill likes everyone.

The above examples show that there is a limit to the possible

scope interactions of quantified expressions within a sentence. Example (38a) is ambiguous with either the universal quantifier everyone or the existential quantifier someone enjoying wide scope. We assume that these readings are yielded by the operation of QR, which adjoins the quantifiers to the clause boundary of the sentence, as in (39):

(39) [<sub>IP</sub> someone<sub>j</sub> [<sub>IP</sub> everyone<sub>i</sub> [<sub>IP</sub> t<sub>i</sub> loves t<sub>j</sub> ]]]

In this construal, the moved quantifiers are in the same c-command domain, and these quantifiers form a  $\Sigma$  sequence. (cf. May (1985)) This is a configuration which satisfies the requirement of the Scope Principle, so that the sentence exhibits ambiguity with respect to the scope of the quantifiers in question, either everyone or someone taking broader scope than the other. On the other hand, (38b) does not have the same scope ambiguity that is found in (38a). In (38b) the existential quantifier someone always takes broad scope over the embedded quantified expression everyone. The judgment can be explained if (38b) is analyzed as having the logical-form representation in (40), where everybody is adjoined to the clause boundary of the lower clause:

(40) [<sub>IP</sub> someone<sub>i</sub> [<sub>IP</sub> t<sub>i</sub> believes [<sub>CP</sub> that [<sub>IP</sub> everyone<sub>j</sub> [<sub>IP</sub> Bill likes t<sub>j</sub> ]]]]]

If Subjacency were irrelevant at LF, there would be no reason that QR derives an LF representation like (41), in which both quantifiers come to constitute a  $\Sigma$  sequence in the main clause by virtue of the movement of everyone to the clause boundary of the matrix clause:

(41) [<sub>IP</sub> everyone<sub>j</sub> [<sub>IP</sub> someone<sub>i</sub> [<sub>IP</sub> t<sub>i</sub> believes [<sub>CP</sub> that [<sub>IP</sub> Bill likes t<sub>j</sub> ]]]]]

The fact of the matter is that the LF structure of (41) is not a legitimate configuration, as the interpretation of the sentence indicates. Since QR is a clause-bound operation, the universal quantifier everyone can only be adjoined to the clause boundary of the embedded clause, and never to the clause boundary of the matrix clause. This fact shows that the LF rule of QR, the rule of forming an operator-variable structure of a quantified expression, is constrained by Subjacency.

The interpretive effects of QR become clear if the subjacency condition is taken to be a constraint on LF movement. By the standard account, however, Subjacency does not constrain another instance of LF move  $\alpha$ , namely, LF Wh movement. If this is correct, one would have to claim that Subjacency selectively applies to one instance of move  $\alpha$  (QR) but not to another (Wh movement) in LF. The question, then, is why the same is not true of all instances of move  $\alpha$  in

LF, especially, given that Subjacency is a general constraint of movement rules. The problem is by no means trivial, and, in particular, on empirical grounds, it is hard to see why the LF derivation of Wh movement should be distinguished from QR in this way.

Furthermore, contrary to what is assumed in the 'barrier' type theory, there appears to be a piece of good evidence that LF Wh movement must also be subject to Subjacency. Evidence can be obtained if we look at a language like Japanese, in which movement of wh phrases is exclusively utilized in the LF component. To see the point, consider the following:

- (42) [ dare-ga kai-ta ] ronbon-ga itiban yokat-ta no?  
       who-NOM wrote     paper-NOM most     good     Q  
       'The paper that who wrote was the best?'

In (42), the wh phrase dare 'who' is embedded in a relative clause, but still the sentence is well-formed. At first sight, we might be tempted to claim that the wh phrase dare extends its scope beyond the syntactic island, just as with what in (34a), but this is not the case. As was argued by Nishigauchi (1986, 1990), the relevant LF movement in (42) pied pipes the entire island in which the wh phrase is contained, as in (43), and thereby Subjacency is respected (despite its appearance to the contrary):

(43) [<sub>CP</sub> [ dare-ga kai-ta ] ronbun-ga<sub>1</sub> [<sub>IP</sub> t<sub>1</sub> itiban  
yokat-ta ] no ]

Though a full-scale examination of the pied piping hypothesis is offered later in Chapter 3, it is sufficient, for the time being, to state that there is good reason to believe that the LF representation in (43) is, in fact, a correct LF construal in the case of a Japanese wh question like (42), and in view of this fact, it is too hasty, then, to conclude that Subjacency is not pertinent to LF Wh movement, by just looking at English multiple wh questions, which contain instances of unmoved wh phrases, since LF Wh movement in Japanese, evidently, observes Subjacency. (Note: Our approach differs from Nishigauchi's approach in several respects, and a full justification of our analysis will be provided in Chapter 4 and 5.)

In connection with this point, it should be noted that there is a trivial way to incorporate the pied piping analysis into the present context and to reconcile it with the LF movement analysis. This can be done by treating wh-in-situ located inside an island as undergoing pied piping, just as is the case with Japanese, and by instantiating the raising of the entire island that contains the wh phrase in the LF component. If such pied piping were operative in LF, then (34a), which is replicated as (44a), would have an LF structure like (44b), as a consequence of LF pied piping:



(44) a. Who remembers who bought what?

b. [<sub>CP</sub> [[<sub>CP</sub> who bought what ]<sub>j</sub> [ who<sub>i</sub> ]] [<sub>IP</sub> t<sub>i</sub>  
remembers t<sub>j</sub> ]]

Such an analysis of a multiple wh question, attractive as it appears at first sight, is open to several criticisms, and it does seem to provide a real answer to the absence of an island effect in this case.<sup>13</sup> One such criticism may be drawn from the fact that the LF structure in (44b), which involves the wh island condition, does not represent the actual interpretation of the multiple wh question, in that who in the embedded clause takes matrix scope as well as what, which is totally impossible. To remedy this deficiency, one might come up with the following LF structure as an alternative:

(45) [<sub>CP</sub> [[<sub>IP</sub> t<sub>k</sub> bought what ]<sub>j</sub> [ who<sub>i</sub> ]] [<sub>IP</sub> t<sub>i</sub> remembers  
[<sub>CP</sub> who<sub>k</sub> t<sub>j</sub> ]]]]

In (45), the embedded clause, to the exclusion of who, is preposed via LF movement in lieu of the entire sequence of the embedded clause. The difficulty with this analysis lies

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13. If we use a language like Sinhalese, it can be readily demonstrated that the scope of wh phrases in a multiple wh question like (44a) is assigned without making reference to LF pied piping. See Kishimoto (1991).

in the fact that in (45) the wh phrase who in the embedded clause cannot control its variable, which is fronted to the clause boundary of the main clause by the LF Wh raising, along with the other material in the embedded clause. Since the trace at issue does not fall under the scope of who in the embedded clause, the sentence is ruled out as ungrammatical. The ill-formedness of (45) as an LF structure for (44a) can be verified by the fact that (46b), but not (46a), is excluded as an unacceptable sentence:

- (46) a. Mary asked John to find out [ who<sub>1</sub> [ t<sub>1</sub> saw who ] ]  
 b. \*Mary asked who to find out [ who<sub>1</sub> [ t<sub>1</sub> saw Bill ] ]  
 c. [CP Mary asked t<sub>3</sub> to find out [CP [ who<sub>3</sub> [ who<sub>1</sub> ] ]  
 [IP t<sub>1</sub> saw Bill ] ]

The LF structure in (46c), which is posited for (46b), shows that if a variable is in the main clause, it cannot be bound by an operator in the lower clause. Thus, the LF structure in (45) cannot be licit.<sup>14</sup>

The data considered so far indicate, at the very least, that the LF movement analysis does not suffice to account for the features of the scope of wh-in-situ. In contrast to this, our proposed analysis, which bifurcates the class of wh phrases into quantifiers and bound variables, can account

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14. This also may be seen as a constraint imposed on the semantic interpretation. For discussion, see Saito (1989).

more naturally for the phenomena we are interested in, and the absence of Subjacency effects at LF straightforwardly falls out from our analysis. In our analysis, scope is encoded into wh-in-situ by means of unselective binding, without referring to movement, as in (47):

(47) [<sub>CP</sub> who<sub>1(j)</sub> [<sub>IP</sub> t<sub>1</sub> remembers [<sub>CP</sub> who<sub>k</sub> [<sub>IP</sub> t<sub>k</sub> bought what<sub>(j)</sub> ]]]]

One of the advantages of expressing scope by means of unselective binding in this fashion is that the theory can provide a well-motivated account for the absence of island effects. Since this analysis views that the position of an unselective binder, which is separate from its bindee, determines the scope domain of quantification, the binding relation of unselective binding can be made across a number of syntactic boundaries. Since wh-in-situ are, if quantified as lexical variables to be bound by an independent binder, assigned scope externally without movement, there is no compelling reason for their scope to observe the island conditions that are respected by (S-Structure) movement.

The irrelevance of bounding theory for the scope encoded by unselective binding can, in fact, be clearly envisioned in the following examples, which are associated with indefinites embedded within syntactic islands (cf. Nishigauchi (1990)):

- (48) a. [<sub>NP</sub> Every man who owns a donkey<sub>i</sub> ] beats it<sub>i</sub>.  
b. [<sub>NP</sub> Every man who knows [<sub>CP</sub> that a donkey<sub>i</sub> is available here ] ] buys it<sub>i</sub>.  
c. [<sub>NP</sub> A farmer [<sub>CP</sub> who wants to know [<sub>CP</sub> whether a donkey<sub>i</sub> is good ] ] ] always examines it<sub>i</sub>.

As the well-formedness of these sentences indicates, the scope of an indefinite like a donkey can easily exceed beyond the clause that contains it. These sentences are all fully acceptable on the donkey interpretation, and the scope of the 'donkey' phrase extends beyond the relative clause in (48a), the relative clause and that-clause in (48b), and the relative clause and whether-clause in (48c). Since an indefinite can form an operator-variable structure by virtue of unselective binding, without undergoing movement, it is quite natural that the scope domain of an indefinite will be free from island effects and that its scope will extend far beyond the clause in which it originates, as long as it is within the scope of its external binder.

The above discussion clearly shows that the peculiar property of wh-in-situ is quite easily assimilated to that of indefinites in donkey sentences, and multiple wh questions turn out to pattern with donkey sentences with regard to the locality of the scope of wh-in-situ. Since the exact nature of the wide scope option of wh-in-situ can be captured at no extra theoretical cost in the unselective binding analysis,

it proves that the unselective binding approach is indeed preferred over the ECP approach in this regard.

#### 2.4.2. Scope Relations

The preceding discussion have focused on one distinctive feature associated with unselective binding, a wide scope option of wh-in-situ, and it has been suggested that there are two distinguishable methods of assigning scope to wh phrases, i.e. Wh-raising and unselective binding, and further that, with the system of unselective binding, we can correctly capture the generalization that the scope of wh-in-situ extends over syntactic islands with no Subjacency effect, while Subjacency is respected by wh phrases that are actually moved in syntax.

In this section, going a step further, we will discuss scope relations revealed in a multiple wh question, and show that the phenomena are also best described by reference to unselective binding. The discussion in this section will center around scope relations involving quantified sentences and wh questions, and the observation will again lead to the conclusion that multiple wh questions share general properties with donkey sentences, and that the former should be created in the same way as the latter.

First, note that our discussion in this section crucially draws on the assumptions concerning the Scope Prin-

ciple, which we assume to operate on quantifiers holding a mutual c-command relation, i.e. those forming a  $\Sigma$  sequence.<sup>15</sup> With this in mind, observe that the following sentences are ambiguous with respect to the relative scope of ordinary quantifiers:

(49) Everyone loves someone.

Since being subject to QR is the distinguishing property of ordinary quantifiers, the scope treatment of ordinary quantified expressions in terms of QR claims that the sentence in (49) has the LF structure shown in (50):

(50) [<sub>IP</sub> someone<sub>j</sub> [<sub>IP</sub> everyone<sub>i</sub> [<sub>IP</sub> t<sub>i</sub> loves t<sub>j</sub> ]]]

The interpretive effects of relative quantifier dependency found in the sentence in (49) is the result of its having the LF structure in (50). In the LF configuration of (50), the two quantifiers constitute a  $\Sigma$  sequence by holding a c-command relation with each other, and this is the legitimate configuration for the Scope Principle to operate on. Thanks to the Scope Principle, the LF configuration is compatible

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15. Aoun and Li (1989) suggest a different version of the Scope Principle, which states that one quantifier has scope over the other if it c-commands a member of the chain of the other quantifier. This proposal has some consequences different from May's, but I do not deal with issues and problems involving this proposal here.

with interpretations in which either everyone or someone has wider scope than the other, as in (51):

- (51) a.  $\forall x[ \text{person}(x) \rightarrow \exists y[ \text{person}(y) \ \& \ [ \text{love}(x,y) ] ] ]$   
b.  $\exists y[ \text{person}(y) \ \& \ \forall x[ \text{person}(x) \rightarrow [ \text{love}(x,y) ] ] ]$

Since the Scope Principle allows the quantifiers in the same c-command domain, i.e. those forming a  $\Sigma$  sequence, to stand in any logical relation with each other, the Scope Principle also derives from the logical syntax in (50) another interpretation which is best represented by an illustrative 'branching' structure, as in (52):<sup>16</sup>

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16. Hintikka (1974) uses a branching notation to express the interpretation on which quantifiers are independent of each other in terms of scope. Unlike Hintikka (1974), we sometimes make use of the notation of restricted quantification whose restricted clause is adjoined to the quantifier, which can be schematically shown below:

- (i)  $[ \text{Qx: P}(x) ] [ \text{Z}(x) ]$

Here,  $P(x)$  will be the restriction on quantification. Given the domain over which individuals quantify, the clause  $P(x)$  will serve to restrict the domain which  $x$  ranges over and the quantification is limited to the subset of  $x$  which satisfies  $P(x)$ . Apart from some details irrelevant to the discussion of the present paper, this notation can, roughly, be regarded as virtually equivalent to (ii):

- (ii)  $\text{Qx} [ \text{P}(x) \rightarrow \text{Z}(x) ]$

For discussion concerning a 'branching' interpretation and related issues, see Barwise (1979), Fauconnier (1975), Heim (1982, 1990), Kadmon (1987, 1990), Kamp (1984), May (1985), among others.

(52)  $\forall x: \text{person}(x)$  }  $\text{love}(x,y)$   
 $\exists y: \text{person}(y)$  }

In a structure like (52), the quantifiers in a different arm of the branching structure are considered to be interpretively independent of each other. In the case of (49), the 'branching' interpretation appears to be equivalent to its first order formula in (51b). But this equivalence does not always hold, as was discussed in May (1985), and the branching interpretation is, in effect, distinct from any first order formula in a sentence like (53), which contain a pair of non-standard quantifiers:

(53) Nobody loves nobody.

As noted in May (1985), the sentence in (53) is at least three ways ambiguous with regard to the relative scope of the quantifiers. Example (53) carries two readings, in which the quantifiers interact with respect to their scope, paraphrased as (54):

(54) a.  $-\exists x[ \text{person}(x) \ \& \ -\exists y[ \text{person}(y) \ \& \ [ \text{love}(x,y) ] ] ]$   
 $= \forall x[ \text{person}(x) \ -> \exists y[ \text{person}(y) \ \& \ [ \text{love}(x,y) ] ] ]$   
 b.  $-\exists y[ \text{person}(y) \ \& \ -\exists x[ \text{person}(x) \ \& \ [ \text{love}(x,y) ] ] ]$   
 $= \forall y[ \text{person}(y) \ -> \exists x[ \text{person}(x) \ \& \ [ \text{love}(x,y) ] ] ]$



Reading (54a) represents the interpretation on which nobody in subject position takes wider scope than nobody in object position, and (54b) represents the reverse scope order. The sentence, then, can be taken to mean either that everybody has a person that he loves or that everybody is loved by a single person. This sentence, further, admits an interpretation on which neither quantifier is dependent on the other. This interpretation, which we term as the branching interpretation, can be expressed in a symbol in (55):

$$(55) \quad \begin{array}{l} \neg \exists x: \text{person}(x) \\ \neg \exists y: \text{person}(y) \end{array} \left. \vphantom{\begin{array}{l} \neg \exists x: \text{person}(x) \\ \neg \exists y: \text{person}(y) \end{array}} \right\} \text{love}(x,y)$$

Intuitively, the logical representation (55) characterizes the situation in which no one is a lover or is loved by anyone. The scope relation that is observed in (55) shows that no scope dependency holds for these quantifiers, and that the two quantifiers are functionally independent of each other. The point to be made here is that when we find multiple occurrence of quantifiers in a single clause, the Scope Principle permits the scope construal to involve a branching interpretation, which is sometimes inexpressible in a first-order language, as well as first-order interpretations.

Turning now to the scope interpretation of a donkey sen-

tence, we should point out here that a notable property that is displayed in a donkey sentence like (56) is that the sentence lacks scope interaction between indefinites or between indefinites and their unselective binder, and the 'branching' interpretation is the only interpretation available:

(56) Always, if a farmer owns a donkey, he beats it.

This scope property of a donkey sentence straightforwardly follows from the analysis in which indefinites are treated as bound variables and are bound by an external quantifier, which can assign a quantificational force. Under this analysis, the scope of the indefinites is represented by coindexation of the indefinites with the universal quantifier always, as in (57):

(57) [ Always<sub>1(j)(k)}</sub> t<sub>1</sub> [ if a farmer<sub>(j)</sub> owns a donkey<sub>(k)</sub> ]  
he<sub>(j)</sub> beats it<sub>(k)</sub> ]

The logical syntax in (57) is equivalent to the logical representation in (58), in which the indefinites have universal quantificational imports:

(58)  $\forall x,y[[ \text{farmer}(x) \ \& \ \text{donkey}(y) \ \& \ \text{own}(x,y) ] \rightarrow$   
beat(x,y) ]



At this point, it is worthwhile to note that under some circumstances, a wh question displays the kind of scope ambiguity that is expected by the Scope Principle (with ordinary quantifiers). First, observe that the following sentence displays ambiguity with respect to the relative scope of who and everyone:

(60) Who does everyone admire?

A question like (60) has two quantifiers which interact scopally with each other, either who or everyone enjoying wide scope. That is to say, the question may be understood as a single question, asking for the identity of a person that everyone admires, or as a distributed question, asking for the listings of the individuals that are admired.

The ambiguity displayed in a question like (60) is derived from the LF structure in which who and everyone come to be in the same c-command domain after the applications of Wh fronting to who and QR to everyone, as in (61):

(61) [<sub>CP</sub> who<sub>i</sub> does [<sub>IP</sub> everyone<sub>j</sub> [<sub>IP</sub> t<sub>j</sub> admire t<sub>i</sub> ]]]

The LF configuration given in (61) is legitimately yielded by

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17. This system does not preclude the possibility that a quantifier which binds indefinites commutes scopally with other independent quantified expressions.

the operations which move who to SPEC of CP at S-structure and adjoin everyone to the clause initial IP at LF. These two quantifiers come to hold a mutual c-command relation in LF, since CP is the sole maximal projection dominating both quantifiers and no maximal projection intervenes between these quantifiers. In this LF configuration, the Scope Principle is satisfied, and who is interpreted as interacting freely with everyone in terms of scope. The scope interaction exhibited in the wh question indicates that a wh phrase may be a member of the class of quantifiers that participate in scope interaction in an appropriate environment.

One of the potential problems pertaining to the account of quantifier scope based on the Scope Principle (by May (1985)) is that the analysis of a sentence like (60) cannot be carried over directly to a sentence like (62), where the underlying (D-structure) order of who and everyone is reversed:

(62) Who admires everyone?

Example (62) is unambiguous with regard to the scope of who and everyone. The only interpretation associated with (62) is a single collective interpretation, on which the question asks for the identity of a person that is admired by everyone.

May (1985) argues that the non-existence of scope inter-

action comes from the LF structure in which everyone is adjoined to the VP node instead of the IP node:<sup>18</sup>

(63) [<sub>CP</sub> who<sub>i</sub> [<sub>IP</sub> t<sub>i</sub> [<sub>VP</sub> everyone<sub>j</sub> [<sub>VP</sub> admires t<sub>j</sub> ]]]]

In a sentence like (62), the movement of everyone to IP violates the Path Containment Condition (PCC), which prohibits the legitimate paths of quantified expressions from crisscrossing (cf. May (1985), Pesetsky (1982)):

(64) [<sub>CP</sub> who<sub>i</sub> [<sub>IP</sub> everyone<sub>j</sub> [<sub>IP</sub> t<sub>i</sub> [<sub>VP</sub> admires t<sub>j</sub> ]]]]

The impossibility of (64) as an LF configuration for (62) immediately follows from the presence of a wh phrase in COMP; the quantifier path by QR would intersect with the path made by Wh movement if the quantifier were moved to IP. Hence the only LF representation available for (62) is the one in which everyone is adjoined to the VP, as in (63), and this construal does not satisfy the structural condition of the Scope Principle. In this configuration, the quantifiers may not

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18. In May's analysis, (63) is the only LF representation available for (62), while the following sentence can have two LF structures, at least as an option, given that VP is a potential landing site of a quantified expression:

(i) Someone loves everyone.

(ii) a. [<sub>IP</sub> someone<sub>i</sub> [<sub>IP</sub> t<sub>i</sub> [<sub>VP</sub> everyone<sub>j</sub> [<sub>VP</sub> loves t<sub>j</sub> ]]]]  
b. [<sub>IP</sub> everyone<sub>j</sub> [<sub>IP</sub> someone<sub>i</sub> [<sub>IP</sub> t<sub>i</sub> loves t<sub>j</sub> ]]]]

display scope interaction, and the relative scope dependency is solely determined by their structural hierarchy in the logical syntax.

Be that as it may, it is important to note here that wh phrases in a multiple wh question never display the scope ambiguity predicted by the Scope Principle, even if they have the same scope domain. Multiple wh questions are somehow exempt from the Scope Principle, even though wh phrases are expressions that can participate in scope interaction in an appropriate context. Consider the following:

(65) a. Who admires who?

b. Who said that John bought what?

They are both well-formed multiple wh questions. In both cases at hand, the unmoved wh phrase has the same scope as the moved wh phrase, but we find that these wh phrases do not interact scopally with each other. The questions simply ask for a list of pairings for the individuals involved, or pairings of individuals and things bought. The only scope interpretation which is associated with the multiple wh question in (65a), for instance, is the one which can be best represented by a branching structure like (66), because neither wh phrase is interpretively dependent on the other in terms of scope:

(66) For which person(x) } admire(x,y)  
For which person(y) }

The crucial point is that multiple wh questions lack interaction with regard to the scope of wh phrases, even though wh-in-situ are always interpreted as having the same scope as a moved wh phrase and that there is no 'distributive' or 'collective' interpretation.<sup>19</sup> That multiple wh questions do not exhibit scope interaction appears to be in apparent violation of the Scope Principle (at least under the standard approach). The question to be asked is why multiple wh questions do not follow the Scope Principle.

On the standard approach, LF constrictals for multiple wh questions are derived from S-structure configurations solely by means of Wh movement, which preposes wh-in-situ into a complementizer position which is already filled by a wh phrase. Since the rule of LF Wh fronting is involved in a formation of the LF structure that underlies the interpretation of a multiple wh construction, wh quantifiers in a multiple wh question inevitably come to hold a mutual c-command relation at LF, as is exemplified by the LF construal in (67) for (65a):

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19. Pesetsky (1987) appears to have made a similar observation, though it is not explicitly mentioned, and developed an analysis on which the Q element is construed as an unselective binder. Also, see Nishigauchi (1986, 1990).



(67) [CP [ who<sub>j</sub> [ who<sub>i</sub> ] ] [IP t<sub>i</sub> admires t<sub>j</sub> ]]

In the LF configuration in (67), the Scope Principle should be as much satisfied as in a multiple-adjunction structure involving a plural number of common quantifiers, which exhibit scope interaction as a consequence of the Scope Principle. Since CP is the sole maximal projection dominating both wh quantifiers in (67), and since there is no maximal projection boundary between the wh phrases, these wh quantifiers should also interact with each other in terms of scope. But this is clearly not the case. The only possible interpretation of (67) is the one in which the scope of the moved wh quantifier is functionally independent of the scope of the unmoved wh phrase.

As was argued originally by Higginbotham and May (1981a, 1981b) and also by Aoun, Hornstein and Sportiche (1981), the desired interpretation of multiple wh constructions may be obtained by a readjustment rule like Absorption under the movement account of wh scope. This rule of Absorption brings about the effect that a number of quantifiers are merged into a single unit, as represented in (68):

(68) ... [ WH<sub>i</sub> [ WH<sub>j</sub> ... --> ... [ WH<sub>i</sub> WH<sub>j</sub> ]<sub>i,j</sub> ...

In this view of Absorption, the LF structure in which a mul-

multiple number of wh phrases are present in a COMP is converted into a structure in which they are interpretable as a single operator expression (as a consequence of Absorption) just like a conjoined constituent:<sup>20</sup>

(69) [<sub>CP</sub> [ who<sub>j</sub> who<sub>i</sub> ]<sub>i,j</sub> [<sub>IP</sub> t<sub>i</sub> admires t<sub>j</sub> ]]

In the LF structure in (69), the two wh phrases undergo Absorption, and then these wh phrases are understood as a single operator in syntactic terms, so that the scope interaction of the wh-quantifiers is prevented in the multiple wh question. The point to be made here is that the standard analysis is required to invoke the readjustment rule of Absorption, independently of Wh movement, in order to block the undesired application of the Scope Principle.

Our alternative model, by contrast, correctly predicts that multiple wh questions are exempt from the Scope Principle and further that multiple wh questions display the scope properties which can be described by a branching structure of wh phrases. In particular, our analysis allows us to account for the scope properties of multiple wh constructions without having to invoke a readjustment rule like Absorption, and the exact nature of the scope properties of wh phrases in a multiple wh question can be captured at no extra cost.

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20. This interpretation is sometimes called a 'uniform' interpretation.

First of all, the apparent lack of scope interaction in multiple wh questions is readily accounted for by the hypothesis that wh-in-situ serve as bound variables and do not undergo Wh movement throughout derivations. Consider, for instance, the following LF structure posited for (65a) under our alternative analysis:

(70) [<sub>CP</sub> who<sub>i</sub>(<sub>j</sub>) [<sub>IP</sub> t<sub>i</sub> admires who(<sub>j</sub>) ]]

The suggested LF structure of (70) has only one wh phrase in operator position, and the unmoved wh phrase remains in situ even in LF. This LF structure comprises only one wh-operator, and it does not furnish a syntactic environment necessary for the Scope Principle to be operative. Therefore, the wh phrases are not expected to interact with each other with regard to their scope.

Furthermore, the proposed analysis can capture an important interpretive effect of a multiple wh construction, which is predicted by the system of unselective binding. In our analysis, wh-in-situ are subject to unselective binding, and thereby the interpretation associated with the logical syntax of (70) is expected to be analogous to the interpretation of a donkey sentence. In fact, the interpretation of a multiple wh question appears to parallel to that of a donkey sentence, obtaining only a 'branching' interpretation like (66). This highly specialized interpretation, alongside of the absence

of scope interaction, is thought to be indicative of the fact that unselective binding is at work in determining the scope of non-moved wh phrases. Since this sort of interpretation is not usually found in a structure in which a number of quantifiers constitute a  $\Sigma$  sequence, it should be reasonable to conclude that the peculiar semantic properties of multiple wh questions are derived from unselective binding.

Summarizing to this point, we argue that the absence of scope interaction between wh phrases in a multiple wh question is automatically derived from the mechanism of unselective binding. In our view, unselective binding assumes responsibility for the lack of scope interaction, since the machinery precludes the possibility of giving rise to a configuration necessary for the Scope Principle to be operative. The proposed analysis further accounts for the fact that multiple wh constructions pattern like donkey sentences with regard to the scope of wh phrases. A difficulty as to the interpretive properties of multiple wh questions found in the standard model does not arise in the analysis in which wh-in-situ are assigned scope by means of unselective binding.

#### 2.4.3. Scope Ambiguity

Given the discussion thus far, it seems fairly clear that moved wh phrases are assigned scope by means of Wh movement and wh-in-situ are assigned scope by means of unselective

tive binding. What is crucial in this claim is that a clear division must be made between two types of wh phrases, according to whether they undergo Wh movement or not, and importantly, in the case of English, this distinction can be made at S-structure. By way of supporting the claim made here, we will present another array of data, which turns out to be consistent with our analysis of multiple wh questions.

Another piece of evidence in favor of our analysis has to do with scope ambiguity found in wh-in-situ. Notice first that a notable difference between moved wh phrases and wh-in-situ is found in the way in which they acquire scope. The following examples illustrate the point:

(71) Who remembers where we bought what?

Example (71) is ambiguous with regard to the scope of what, and the unmoved wh phrase what can be construed either with who in the main clause or with where in the embedded clause.

The scope ambiguity revealed in wh-in-situ is absent in the case of the scope of moved wh phrases. For example, (72) is unambiguous, as opposed to (71), since the moved wh phrase where cannot be associated with who in the main clause as a direct double question:

(72) Who remembers where we bought the book?

Example (72) is only interpreted as a singular wh question, asking for the identity of the person that remembers the place in which the book was purchased.

The important generalization which must be drawn from the above-mentioned facts is that only wh-in-situ, as opposed to moved wh phrases, are allowed to take either wide scope or narrow scope in a multiple wh construction like (71). A question which naturally arises is how we should treat the peculiar scope properties of wh phrases, distinguished according to whether they are moved at S-Structure or not.

In order to account for the facts, the standard analysis utilizes filtering mechanisms, such as the COMP indexing algorithm, which Lasnik and Saito (1984) claim to be universal, along with several other filters.<sup>22</sup> Utilization of such filtering mechanisms is necessary under a general approach of the move alpha analysis, because application of Wh movement is, by hypothesis, free. In this system, wh phrases are allowed to move, essentially, to any position by the rule of move  $\alpha$ , unless the application of the rule is blocked by independent principles or some other mechanisms. In this particular case, since there is no principle to guarantee the desired results in the grammar, the standard analysis requires stipulating the presence of a filtering apparatus,

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22. Lasnik and Saito (1984, 1989) give a detailed discussion of the COMP indexing procedure. See also Aoun, Hornstein and Sportiche (1980).

whereby the relevant scope properties of multiple wh interrogations are derived.

On the other hand, the scope properties of wh phrases are readily accounted for in the unselective binding analysis, without appealing to a filtering device, given the assumption that wh-in-situ serve as bound variables while they remain in place throughout derivations. Although the COMP-indexing mechanism may be necessitated to account for the selectional property of complementizers, it is not necessary to make a crucial reference to the COMP-indexing algorithm at all under our account, so as to explain the scope behavior of wh phrases in a multiple wh interrogation.

Recall now that the crucial assumption we have made in the proposed analysis is the distinction drawn between a moved wh phrase and a wh-in-situ; under our analysis, the former is a quantified expression which acquires scope by movement and the latter is a variable to be bound by an external quantifier. Thus, a moved wh phrase receives scope by forming an operator-variable structure by virtue of Wh movement. The scope of a moved wh phrase is, then, determined by the position which it actually occupies at S-structure. By contrast, a wh-in-situ is assigned scope through unselective binding, so that its scope is contingent upon where its binder is located. Consider the following:

(73) Who knows where we bought what?

In (73), where gets moved to the operator position of the embedded clause, thereby forming a legitimate operator-variable structure by virtue of Wh fronting. Since the moved wh phrase is an operator but not a bound variable, there is no way for where to get bound by the wh phrase who in the matrix clause. Hence, the moved wh word where only takes embedded scope.

In contrast to this, what, which remains in situ at S-structure, may be associated with who, taking matrix scope, or with where, taking narrow scope with respect to who. Since wh-in-situ are bound by an external operator in our analysis, the scope of the wh-in-situ what is determined by the position of an operator which binds the wh phrase. In the case of (73), two wh phrases are available as potential unselective binders; one is who in the main clause, and the other is where in the embedded clause. If who is chosen as an unselective binder, then the wh-in-situ acquires matrix scope and the sentence is understood as a direct double question. If the choice is where, it takes embedded scope, and the question is interpreted as a singular wh question.<sup>23</sup>

Moreover, the hypothesis predicts, in line with this argument, that wh-in-situ never extend scope over the clause where no operator is situated. This is because scope is en-

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23. The crucial assumption is that a wh phrase may not count as 'quantifier' and 'variable' simultaneously.



coded into wh-in-situ by way of an operator-variable structure formed with a moved wh phrase. This prediction is, in fact, correct. Consider the following:

(74) I wonder who John told to read what.

In (74), the wh phrase what remains in place at S-structure, without undergoing Wh fronting. As is expected, (74) is only understood as having the multiple wh reading, where what is construed with who. This shows that if we find a unmoved wh phrase in a wh construction, i.e. in a multiple wh construction, the non-moved wh phrase must have the same scope domain as a moved wh phrase. Furthermore, it should be noted that in this type of construction, there is no way of obtaining the reading on which the scope of what falls over the complement clause of told, even though what can occupy this position at S-structure by overt Wh movement, as in (75):

(75) I wonder who John told what to read.

Incidentally, note that (75), which contains two moved wh phrases, can never be understood as a double question. The reason for this is simply that wh phrases in (75) are both moved into operator positions at S-structure, and these wh phrases are thus unable to take the same scope domain, since they only count as quantifiers, whose scope domain is unam-

biguously fixed by an S-structure configuration.

The correctness of this approach can be further confirmed by the fact that sentences like (76), where no wh phrase undergoes Wh fronting at S-structure, are ruled out as ill-formed, as indicated below:

(76) a. \*Mary remembers John read what?

b. \*Did you see what?

Apart from echo interpretations, the examples in (76) have no interpretations. This clearly illustrates the fact that scope cannot be assigned to wh-in-situ unless the sentence has a moved wh phrase in S-structure. Under our model, the ungrammaticality of the sentences in (76) is a natural consequence of the fact that no scope assigner to the wh-in-situ is available, and the data indicates that the scope of wh-in-situ is totally dependent on a moved wh phrase, which we assume to function as an unselective binder. Since the well-formedness of the unselective binding construal is determined by the presence or absence of an operator in a SPEC of CP at S-structure in our analysis, our proposed analysis can give a ready explanation for the fact that multiple wh questions like (76) necessarily result in unacceptable sentences.

As illustrated above, the scope contrast between moved wh phrases and wh-in-situ finds a natural explanation if scope assignment by unselective binding is carefully distin-

guished from that by Wh movement. It must be emphasized here that our analysis does not require stipulating any filtering mechanisms as is done by the standard account. The scope facts on multiple wh questions clearly indicate that while moved wh phrases are assigned scope by means of Wh movement, wh-in-situ are assigned scope by a wh phrase in operator position through unselective binding (but not conversely). The facts considered so far strongly suggests that Wh fronting is irrelevant to the scope interpretation of wh-in-situ, and our analysis offers a desirable way to handle the full range of data in a principled way.

#### 2.4.4. Adjunction

In Section 2.4.2, it has been suggested that the fact that a multiple wh question like (77a) lacks the scope interaction anticipated by the Scope Principle can be best treated by positing an LF configuration like (77b) for the multiple interrogation (77a):

(77) a. Who admires who?

b. [CP who<sub>1</sub>(<sub>3</sub>) [IP t<sub>1</sub> admires who(<sub>3</sub>) ]]

It must be recognized here that since only one wh phrase occupies SPEC of CP in this representation, this is not a legitimate structure that the Scope Principle can operate on.

The proposed analysis claims that Wh movement never gives rise to a configuration in which a multiple number of wh operators occupy the same SPEC of CP, so that multiple wh interrogatives do not display any interaction with regard to the scope of wh phrases.

In conjunction with this point, it should be noted that our analysis states that multiple wh questions have LF structures which are identical to their S-structure configurations and that Wh movement is applicable only at S-structure (in English). With this in mind, let us for the moment consider the general features of Wh fronting and of multiple wh constructions. First, note that a distinct property of multiple wh questions lies in the fact that they do not allow more than one word to be fronted per clause by overt Wh movement, as shown by the minimal pair in (78):

- (78) a. Who do you expect to buy what?  
b. \*What who do you expect to buy?

The fact is consistent with our analysis, in which a multiple wh question is assumed to have at most one wh phrase in a SPEC of CP. Under the movement account of wh scope, however, it is not entirely clear (on empirical grounds) why the construal in (79) is excluded as an S-structure configuration, because this configuration is legitimate in LF:

(79) [<sub>CP</sub> [ what<sub>j</sub> [ who<sub>i</sub> ] ] do [<sub>IP</sub> you expect to t<sub>i</sub> buy t<sub>j</sub> ]]

The move alpha approach stands in need of explication for why this is not allowed in S-structure, and demands a further explanation, presumably by utilizing a filter like the Doubly Filled COMP filter.

By contrast, in our analysis, all the properties of wh questions follow without difficulty, because our analysis simply does not allow for an LF configuration posited for a multiple wh interrogation under the standard account. In general, since SPEC of CP offers only one escape route accessible to Wh movement, and since adjunction is not permitted for Wh fronting, the landing site of Wh fronting cannot be occupied by more than one wh word. Therefore, adjunction to SPEC of CP yields an ill-formed sentence, as shown below:

- (80) a. \*What who do you expect to buy?  
b. \*Who what do you expect to buy?

The examples in (80) show the result of multiple wh fronting of wh words to SPEC of CP in the main clause. As expected, they are ruled out as ungrammatical, because SPEC of CP under consideration is doubly filled. The ill-formedness of (80) is a consequence of the structural constraint which requires that SPEC of CP be filled at best one wh word.

This constraint also accords with the the fact that we

have a standard violation of a wh island constraint if a wh word is moved out of a wh island:

(81) ?\*What does Mary remember where you bought?

In (81), the movement of what involves extraction out of a wh island, and yields a mild Subjacency violation, since this movement crosses a barrier (or a bounding node), namely, CP in the embedded clause. This is due to the fact that SPEC of CP in the complement clause, which was already filled with a wh word, is not accessible to the secondary movement of a wh phrase, as indicated below:

(82) [<sub>CP</sub> what<sub>i</sub> does [<sub>IP</sub> Mary remember [<sub>CP</sub> where<sub>j</sub> [<sub>IP</sub> John  
bought t<sub>i</sub> t<sub>j</sub> ]]]]

If adjunction is granted for Wh movement, there would be no reason that the movement of what should display a Subjacency effect, since adjunction to SPEC of CP in the subordinate clause nullifies the barrierhood of the lower CP:<sup>24</sup>

(83) [<sub>CP</sub> what<sub>i</sub> does [<sub>IP</sub> Mary remember [<sub>CP</sub> t<sub>i</sub> [<sub>CP</sub> where<sub>j</sub> [<sub>IP</sub>

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24. Chomsky (1986b) suggests that adjunction be limited to non-argument, in order to distinguish CP and NP from other maximal projections. However, as has often been pointed out, Wh movement would become too permissive if this stipulation were accepted.

John bought t<sub>1</sub> t<sub>3</sub> ]]]]

However, the derivation of (83) cannot be the right one for (81), since (81) exhibits a Subjacency effect. This observation of the status of Wh fronting of what is further strengthened by the acceptability of (84), which involves the movement of what from the position inside the embedded clause to the topmost COMP, by way of an intermediate COMP:

(84) What does Mary remember John bought?

The 'long' distance movement of what from a complement clause is possible if SPEC of CP in the lower clause is not filled with a wh word, as is exemplified in (84). In the case of (84), then, the wh phrase what must be moved, due to a Subjacency requirement, from its D-structure position to the topmost COMP by way of the intermediate COMP, which constitutes a sole escape route for Wh movement:

(85) [<sub>CP</sub> what<sub>1</sub> does [<sub>IP</sub> Mary remember [<sub>CP</sub> t<sub>1</sub> [<sub>IP</sub> John  
bought t<sub>1</sub> ]]]]

To account for the difference between (81) and (84), thus, it is necessary to assume that Wh movement may not involve adjunction (at least to CP), and by this assumption, we can

naturally account for the fact that movement from an embedded question, whose COMP is filled by a wh phrase, is impossible, while movement from a lower clause whose COMP is empty is possible. Or else, we could not account for the ungrammaticality of (81).

Since we are claiming that no Wh movement takes place in LF, we can make a considerably strong claim on the status of Wh fronting. Under our hypothesis, Wh movement can be defined as a strict substitution operation, which requires an empty COMP position in the course of any application of the movement rule.<sup>25</sup> On the standard model, however, the status of Wh movement is obscured for a theory-internal reason, to the extent that the theory permits adjunction of wh phrases at the level of LF. The derivation of (83) at S-structure thus must be blocked by a surface filter in this treatment. The Doubly Filled COMP filter plays a crucial role in discriminating between possible and impossible cases. By contrast, our analysis does not require even stipulating the presence of such filters. In our analysis, the notion of un-

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25. This claim would be too strong if it were assumed as in Chomsky (1986b) that VP adjunction may take place in the derivation of S-structure movement. But the point is that CP-adjunction is not permitted for S-structure movement of wh phrases but this type of adjunction is necessary for LF Wh movement so as to derive a desired scope representation from an S-structure counterpart under the 'barrier' approach. It should also be noted that there are many ways of removing the hypothesized VP adjunction from the 'barrier' system, with a minor alternation in the definition of 'barrier', so that the stipulated VP adjunction should not much concern us here at least in the context of the present discussion.



selective binding is crucially utilized, and Wh movement is restricted to cases where a landing site is available for Wh fronting. This analysis can readily account for the fact that a multiple wh question can have only one wh phrase fronted per clause, while others remain in situ. In this respect, our proposed analysis proves to be favored over the standard analysis, and the facts offer substantial support for our analysis.

In this connection, it should be noted, as a last point, that the proposed analysis conforms to the general principle of SPEC-head agreement, which has been assumed in generative grammar. As is often discussed, it is a general property of SPEC-head agreement that a functional head  $X^0$  and its specifier stand in one-to-one relation and a functional head can have one and only one specifier (if any), as below:

(86) [ XP ..  $Y^0(Q)$  ...

One of the major strengths of our proposed analysis is that the present account allows us to claim that the bi-uniqueness requirement of SPEC-head agreement should be sustained throughout the derivational history of a wh interrogative construction. This is made possible only when we claim that Wh movement is not invoked at LF and that wh-in-situ remain in place even at LF. That we can maintain the one-to-one

correspondence between a moved wh phrase and a Q element throughout the derivation of a multiple wh question in a relatively general way is one of the desirable consequences of our proposal. (It also has a further significant consequence of constraining the strong generative power of the putative LF Wh movement). The standard 'movement' theory, by contrast, would be forced to claim that this property of SPEC-head agreement does not hold at LF, since as many possible wh quantifiers as there are in a multiple wh question can occupy a single specifier position. The 'movement' theory is somewhat weaker in this respect in that the Q element is allowed to stand in one-to-many relation with wh phrases at the level of LF, running afoul of the general requirement of SPEC-head agreement. Again, our proposed analysis is favored over the standard analysis.

### 2.5. A Corollary

We have thus far seen that the peculiar properties of multiple wh questions can be accounted for by considering wh-in-situ in a multiple wh question to be subject to unselective binding, as a result of which they can form legitimate operator-variable formats with a moved wh phrase. It has been claimed that the unselective binding analysis has the advantage of explicating a number of differences that distinguish wh-in-situ from moved wh phrases. The discussion

strongly suggests that Universal Grammar makes available two types of wh phrases, distinguished by whether they undergo Wh movement or they are bound by an external binder.

Up to now, we have limited our attention to providing an answer to the question of why wh-in-situ are exempt from Subjacency and how we can explicate the phenomena within the system of unselective binding. Having established the adequacy of the unselective binding analysis, we are now ready for a look at some cases where wh questions involve the so-called ECP violations, and in this section, we take up the problem of why, whose behavior sharply contrasts with that of other wh phrases, and consider how the contrast can be handled within the present framework.<sup>26</sup>

Let us first consider the following multiple interrogations, and observe that wh phrases are usually permitted to stay in situ, irrespective of whether they are categorized as arguments or non-arguments (adjuncts):

- (87) a. Who admires who?  
b. Who gets her groceries where?  
c. Where did you buy what?

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26. We will not deal with the so-called 'that-trace' effect, which is usually subsumed under the ECP. In our system of unselective binding, this effect must be derived from an independent principle that is concerned with 'movement', and this clearly goes beyond the scope of unselective binding.

In (87a), both moved wh phrase and wh-in-situ are argument wh phrases. In (87b), who, which is an argument wh phrase, is moved to COMP and where, which is an adjunct, remains in place. Conversely, in (87c), an adjunct wh phrase where is fronted, while an argument wh phrase what remains in situ. The multiple wh questions in (87) are all well-formed, and have the multiple wh readings.

An important exception to the generalization can be found in a subclass of wh phrases which are considered to constitute an adjunct type of wh phrases. Wh phrases such as why and how are included in this category, and they are ungrammatical if they are not displaced at S-Structure, as shown in (88)

- (88) a. \*Who remembers who bought the book why?  
b. \*Who remembers who bought the book how?

The ungrammaticality of (88) starkly contrasts with the grammaticality of (89), in which where and when are substituted for why and how:

- (89) a. Who remembers who bought the book where?  
b. Who remembers who bought the book when?

The crucial point to be noticed here is that wh phrases such as why and how must be moved to COMP in S-structure, as il-

illustrated by the minimal pairs in (90) and (91):

- (90) a. \*What did you buy why?  
b. Why did you buy what?

- (91) a. \*Who knows what John did how?  
b. Who knows how John did what?

In contrast to this, no such problem arises for wh phrases like for what reason or in what way, even though for what reason and in what way are synonymous with why and how, respectively. Unlike why and how, it is perfectly permissible for those wh phrases to remain in situ, as the difference in grammaticality between the (a) and (b) examples in (92) and (93) indicates:

- (92) a. \*Who believes Mary why?  
b. Who believes Mary for what reason?

- (93) a. \*Who fixed your car how?  
b. Who fixed your car in what way?

The question to be considered is how we can account for the contrast which we obtain in the examples in (92) and (93).

Under the orthodox ECP analysis, this remarkable difference that distinguishes between why and how, on the one

hand, and for what reason and in what way, on the other, is attributed to the syntactic environment in which they occur. The difference in grammaticality here is derivable, by the standard account, on the assumption that in cases like (92b) only the wh phrase within the PP, but not the entire PP containing wh phrase, is moved into COMP at LF, as shown by the LF representation in (94b):<sup>27</sup>

- (94) a. [<sub>CP</sub> [ why<sub>j</sub> [ who<sub>i</sub> ] ] [<sub>IP</sub> t<sub>i</sub> believes Mary t<sub>j</sub> ] ]  
 b. [<sub>CP</sub> [ [ what reason<sub>j</sub> ] who<sub>i</sub> ] [<sub>IP</sub> t<sub>i</sub> believes Mary  
 [<sub>PP</sub> for t<sub>j</sub> ] ] ] ]

In (94b), even though the entire PP is an adjunct, the wh phrase, which constitutes a subpart of the PP, is held to be lexically governed by the preposition for, since the preposition takes the wh phrase as its complement. If this is correct, the movement of what reason is legitimate; the trace of what reason satisfies the ECP because its trace is properly governed by the preposition for, thereby the sentence being ruled grammatical. In contrast to this, if we assume that why originates from an adjunct position and that it is raised by LF movement and adjoined to the wh phrase which has already occupied the COMP as in (94a), the ECP violation of (92a) follows. The reason is that the trace of why is not

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 27. See Huang (1982a, 1982b), Lasnik and Saito (1984, 1989), May (1985) and works cited therein.

antecedent governed, since it is not c-commanded by its head why, nor is this trace lexically governed, since no lexical categories govern the trace. With the additional provision regarding the status of why as an adjunct, the ECP approach is quite capable of providing an account in such a way that accords with the intuition that the sentence which has non-moved why is ungrammatical, whereas the sentence which has for what reason in the same context is acceptable.

One sort of problem attending the ECP analysis, however, is that most adjunct wh phrases, to the exclusion of why and how, apparently behave like argument wh phrases, as shown below:

- (95) a. Who gets the textbooks where?  
b. Who did you talk to when?

On the ECP approach, the fact that some adjunct wh words pattern with argument wh words is potentially problematic, since LF Wh fronting of an adjunct phrase in a multiple interrogation should always yield an ECP violation, as illustrated by the following LF representation for (95a):

(96) [<sub>CP</sub> [ where<sub>j</sub> [ who<sub>i</sub> ] ] [<sub>IP</sub> t<sub>i</sub> got the textbooks t<sub>j</sub> ] ]

In the LF representation of (96), the trace of where is neither lexically governed nor antecedent governed, so that

the sentence should be ruled out, in violation of the ECP, on exactly the same grounds as (90a) is excluded. But this is not the case. The simplest way of remedying this deficiency is, as was first proposed in Huang (1982b), to add a stipulation to require that adjunct wh phrases such as when and where be inserted in the syntactic environment, [ P [ \_ ] ], where P represents a lexical or non-lexical (or empty) preposition. Given this assumption, LF movement of a wh phrase like where or when will in no way lead to an ECP violation, because the trace left behind will always be properly governed by the invisible preposition P. This approach, however, is not well-motivated, for the presence of an invisible preposition is not yet attested.

On the unselective binding approach, in contrast, the difference in acceptability shown above is more effectively treated on the assumption that the subclass of wh phrases, which comprises why and how, is a class of wh expressions, which are not susceptible to unselective binding, as opposed to other common wh phrases.<sup>28</sup> On this view, we can keep track of the grammaticality or ungrammaticality of the sentences above solely on the basis of the assumption that wh

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28. Although this analysis renders the stipulation concerning null prepositions unnecessary, the analysis calls for the assumption that wh phrases like why and how are distinct from wh phrases like when and where. In the next chapter, we will present an in-depth discussion in support of the view that why in fact differs from other wh phrases on the basis of Sinhalese data. Interestingly, the putative difference is clearly manifested in Sinhalese.



phrases like why and how, in opposition to when and where, do not count themselves as bound variables. In this analysis, a sentence like (97a), for instance, is ruled out on the basis of a failure of assigning scope to the non-moved wh phrase why, as illuminated in (97b):

(97) a. \*Who bought these books why?

b. [<sub>CP</sub> who<sub>i</sub> [<sub>IP</sub> t<sub>i</sub> bought these books why ]]

In contrast, since where, unlike why, may be viewed as a variable, the wh-in-situ where in (98a) can be legitimately assigned scope by means of unselective binding, as illustrated in (98b):

(98) a. Who bought these books where?

b. [<sub>CP</sub> who<sub>i(j)</sub> [<sub>IP</sub> t<sub>i</sub> bought these books where<sub>(j)</sub> ]]

In the case of (98), scope can be legitimately encoded into the wh-in-situ, for unselective binding serves as the basis for assigning scope to the non-moved wh phrase. Hence the sentence proves to be well-formed. The grammatical contrast between the examples in (97a) and (98a) reflects the restricted distribution of why and the ill-formedness of (97a) clearly indicates that why is unambiguously construed as an inherent quantifier, whose quantificational force is expressible only by means of movement. The crucial payoff of

the unselective binding framework is that no special rule has to be posited to account for the contrast between (97a) and (98a) if we assume that what is held responsible for the scope of wh-in-situ is unselective binding.<sup>29</sup>

## 2.6. Summary.

In this chapter, we have developed a framework of the

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29. It is sometimes claimed that the ECP model is capable of handling the so-called 'superiority' effect, which is exemplified below (cf. Kayne (1984), Lasnik and Saito (1984, 1989)):

- (i) a. Who bought what?
- b. \*What did who buy?

Under the ECP account, the difference in acceptability between (ia) and (ib) is explained on the basis of the following LF configurations:

- (ii) a. [<sub>CP</sub> [ what<sub>j</sub> [ who<sub>i</sub> ] ] [<sub>IP</sub> t<sub>i</sub> bought t<sub>j</sub> ] ]
- b. [<sub>CP</sub> [ who<sub>i</sub> [ what<sub>j</sub> ] ] [<sub>IP</sub> t<sub>i</sub> bought t<sub>j</sub> ] ]

Whereas both traces are properly governed in (iia), the trace in subject position is not properly governed in (iib), which is in violation of the ECP. Therefore, we obtain the relevant contrast in grammaticality between (ia) and (ib). Obviously, it is impossible to implement this sort of account to explain the contrast between (ia) and (ib) in the suggested analysis. Although we do not provide a complete account for the contrast found in the wh-binding relation between (ia) and (ib), we suggest here that one possible way of treating the asymmetry in our analysis is to utilize the notion of Crossover. This appears to be a reasonable way, since wh-in-situ are, under our view, construed as bound variables. In our treatment, we can require that wh-in-situ be within the scope of a moved wh phrase, which functions as a scope assigner (i.e. wh-in-situ are c-commanded by the initial trace of the moved wh phrase), in order to have well-formed operator-variable formats. (cf. Higginbotham (1980, 1982), Aoun and Sportiche (1982) etc.)

theoretical concept of unselective binding, in terms of which we can account for the broad range of multiple wh interrogation phenomena in both insightful and explanatory ways. Early work in generative grammar tended to stress the uniformity of the syntactic behavior of wh phrases, but our analysis has shown that the two distinguishable classes of wh phrases must postulated in order to properly characterize the scope behavior of multiple wh questions.

The discussion has revealed that multiple wh questions are best analyzed if we assume that Wh movement occurs only in S-structure in English. In the suggested analysis, multiple wh interrogatives are dealt with in much the same way as we treat 'donkey' sentences. The proposed analysis, while preserving some traits of the previous treatments, allows us to capture important generalizations that would be missed otherwise, and it turns out that the unselective binding analysis offers us a desirable way of handling the phenomena involving multiple wh questions.

## CHAPTER 3

### LF PIED PIPING: EVIDENCE FROM SINHALESE

#### 3.1. Introduction

In the preceding chapter, we have argued that Wh fronting does not take place in LF in English and that wh-in-situ, which are found in English multiple wh questions, are not raised by Wh movement at the LF level. This does not, however, mean that natural language never makes available an LF analogue of Wh movement. Instead, we presume that LF Wh movement is instantiated in languages like Japanese, Sinhalese, etc., in which no S-structure Wh movement takes place. As is often observed, one of the problems for this assumption is that Subjacency effects are, in most cases, not observable in the case of LF Wh fronting. In answer to this problem, we argue that LF Wh fronting behaves exactly like S-structure Wh movement in regard to Subjacency, but machinery of LF pied piping makes Subjacency superfluous.

To verify this claim, this chapter provides an array of novel data attested in Sinhalese, which indicates that Subjacency is, in fact, a viable constraint even on LF Wh raising and that apparent immunity to Subjacency must be explained in terms of the notion of pied piping. It is shown

on the basis of Sinhalese data that a satisfactory characterization of the LF Wh movement phenomena must include a system of pied piping, in which the quantificational domain of a wh phrase is specified by means of a quantificational domain marker. It is also argued that the presently available solutions to LF pied piping are unable to offer a well-motivated account for the pied piping phenomena and that the relevant phenomena are adequately handled only by reference to machinery of pied piping defined by a quantificational domain marker. Toward the end of this chapter, we will further provide a conceptual argument on the structure of a pied piped constituent.

### 3.2. LF Wh Movement and Subjacency

It is a widely accepted assumption that languages diverge with regard to the module of the grammar where Wh movement is invoked. In English, Wh fronting occurs in syntax and the rule of Wh fronting places one and only one wh phrase in SPEC of CP at S-structure. In contrast to this, Japanese does not employ S-structure movement of wh phrases, so that all wh phrases remain in situ at S-structure. Instead, Japanese has a rule of Wh fronting in logical syntax. Since we do not have source information on the scope of wh phrases at S-structure in the case of Japanese, it would seem reasonable to claim that an abstract source for wh scope

should be sought in an LF configuration yielded by LF Wh raising after syntax.

Some evidence for the correctness of the view that a wh phrase in a wh question receives a structural scope by means of LF Wh movement can be deduced from a number of syntactic phenomena including Subjacency. Perhaps, the most convincing argumentation for the existence of LF Wh movement in Japanese can be drawn from the fact that we find island effects in some wh constructions:

- (1) ?\*Taroo-wa [ Jiroo-ga nani-o mot-te-ki-ta ka-doo-ka ]  
Taroo-TOP Jiroo-NOM what-ACC brought whether  
sit-te-iru no  
know Q  
'?What does Taroo know whether John brought?'

In a wh construction such as in (1), the grammatical judgment appears to be comparable to its English counterpart, in which the wh phrase what is actually exported from within the wh island. The wh construction in (1) is identical to the English translation in all relevant aspects (except for the position of the wh phrase), and notably, this wh construction shares the property of Subjacency with the English counterpart. Since there is little doubt that Subjacency counts as a constraint concerning movement, it can be concluded that the semantic effect of Subjacency in (1) has to be stated by means of LF Wh movement.

The existence of LF Wh movement in a language like

Japanese is postulated on the basis of the scope properties of wh phrases in wh questions, but there has been much debate over the nature of LF Wh movement. One of the puzzling problems pertaining to LF Wh movement is that the effect of Subjacency, in the first place, cannot be detected in a sentence like (2), in which a wh phrase is deeply embedded in a complex NP island:<sup>1</sup>

- (2) Taroo-wa [ dare-ga kai-ta ] hon-o yon-da no?  
Taroo-TOP who-NOM wrote book-ACC read Q  
'Taroo read a book that who wrote?'

In an attempt to account for the well-formedness of the sentence, two different views, namely, the ECP analysis and the pied piping analysis, have been advanced in the literature. According to the ECP analysis, (cf. Huang (1982a, 1982b), Lasnik and Saito (1984) etc.), the acceptability of (2) is accounted for in terms of the ECP, rather than Subjacency, with the proviso that Subjacency is irrelevant to LF Wh movement:<sup>2</sup>

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1. In this chapter, we are not concerned with determining what counts as a barrier (or a bounding node), but rather, to avoid some technical problems pertaining to the definition of Subjacency, we simply assume that Subjacency is defined in a construction-particular manner.

2. This assumption, of course, raises the question of what makes a sentence like (1) unacceptable, since (1) shows a Subjacency effect equivalent to its English translation. This is also a problem inherent to the pied piping analysis, since pied piping is, apparently, not applicable to a wh island in the case of Japanese.

(3) [<sub>CP</sub> dare-ga<sub>i</sub> [<sub>IP</sub> Taroo-wa [<sub>NP</sub> [ t<sub>i</sub> kai-ta ] hon ]-o  
yon-da ] no ]

In the ECP analysis, it is argued that dare 'who' is fronted to the clause boundary of the sentence by means of Wh movement, regardless of the fact that dare is located inside a relative clause, which constitutes an island. Although dare is extracted from the relative clause in the case of (3), the LF structure is claimed to be well-formed in this analysis, since the initial trace created by the LF movement of dare is properly governed. In this analysis, the long distance Wh movement at LF is legitimate insofar as its (original) trace is properly governed.<sup>3</sup>

On the other hand, under the pied piping hypothesis (cf. Nishigauchi (1986, 1990), Choe (1987)), it is claimed that Subjacency is, in fact, observed by LF Wh fronting, despite appearances to the contrary, and that a sentence like (2) has an LF configuration like (4), in which the entire island is fronted by LF Wh raising, with the mediation of LF pied

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3. The classical definition of the ECP is as follows:

- (i) A nonpronominal empty category must be properly governed.
- (ii) x properly governs y if x governs y and
  - (a) x is a lexical category X<sup>0</sup> (lexical government)
  - or (b) x is coindexed with y (antecedent government).

See Lasnik and Saito (1984).



piping:

(4) [<sub>CP</sub> [ dare-ga kai-ta ] hon-o<sub>i</sub> [<sub>IP</sub> Taroo-wa t<sub>i</sub> yon-da ]  
no ]

The pied piping analysis contends that a wh phrase, if it is located inside an island, may pied pipe the island with it, raising the entire island. The pied piping approach analyzes the apparent unbounded nature of LF Wh movement as a case of LF pied piping, and in fact, as being made up of a local wh-binding relation which obeys Subjacency. In (2), for instance, since the entire sequence of the complex NP is interpreted as a constituent that is moved by LF Wh movement under this view, the LF structure in (4) is legitimately derived without giving rise to a Subjacency violation.

If we compare these two analyses, it is clear that the pied piping analysis has a more intuitive appeal than the ECP analysis, since the pied piping analysis enables us to establish a correspondence between S-structure and LF with regard to Subjacency, and in the perspective of seeking a unified account for the Wh movement phenomena, it is in fact even desirable to regard LF Wh movement as susceptible to Subjacency. If we accept the view that the apparent immunity to Subjacency can be taken as a sign indicating that Subjacency is not violated by movement, the most natural account for the fact is that in cases like (2), a wh phrase is not actually

moved out of a syntactic island in which it occurs, and in this regard, the pied piping analysis should be preferred over the ECP approach (at least on conceptual grounds). What we will show in the present paper is, in essence, that Subjacency is indeed a viable constraint on movement (even in LF) and that the machinery of pied piping gives us the effect of the long distance movement.

The pied piping analysis, attractive as it is, appears to raise a number of problems, and in the present paper we will discuss, among other things, two significant problems related to the LF pied piping analysis. As is obvious, one of them is concerned with the condition imposed on pied piping. Due to the lack of a well-motivated account of what triggers pied piping, we need to determine some algorithms for the interpretation of a wh question involving LF pied piping. The other problem is how we can provide a natural account for why the sentence in (5), which involves the wh phrase naze 'why' inside an island, is deviant:

- (5) \*Taroo-wa [ Jiroo-ga naze kai-ta ] hon-o yon-da no?  
 Taroo-TOP Jiroo-NOM why wrote book-ACC read Q  
 'Taroo read a book that Jiroo wrote why?'

Sentence (5) is ungrammatical, and apparently a wh phrase like naze cannot pied pipe an island with it. The question to be answered is why naze cannot be subject to the LF strategy of pied piping. It should be apparent that these

are questions for which any theory of pied piping must provide well-motivated answers.

In what follows, we will embark on an attempt to provide partial answers to the questions addressed above, making crucial use of data from Sinhalese. In so doing, we will also discuss factors that we believe to be relevant for the formation of a pied piped constituent. Since the definite answers to these questions are readily obtained by looking at Sinhalese, we will primarily be concerned with data in Sinhalese.

### 3.2.1. Basic Data: Evidence from Sinhalese

The peculiarity of Sinhalese lies in the fact that the effect of LF pied piping is clearly visible in surface strings in syntax, although Sinhalese is, as is the case with Japanese, regarded as utilizing movement of wh phrases at the LF level. This notable property of Sinhalese is derived from the fact that the formation of wh questions in Sinhalese is accomplished through the addition of the Q morpheme də to a wh phrase in argument position, whereas wh questions in Japanese are expressed through the placement of the Q element ka (or no) in clause final position, as in (6) and (7):<sup>4</sup>

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4. To be strict, the sentence final no in Japanese indicating an interrogation is considered as an abbreviated form of no (desu) ka. The simple use of no as expressing an interrogation is often found in colloquial speech. For the sake of convenience, we will regard no as a kind of Q element.

(6) Japanese

dare-ga Taroo-ni at-ta no?  
who-NOM Taroo-DAT met Q  
'Who met Taroo?'

(7) Sinhalese

kau-də Chitra-wə dəkke?  
who-Q Chitra-ACC saw  
'Who saw Chitra?'

In Sinhalese, the sentence-medial Q element də indicates that the sentence is to be construed as a question. In the case of a wh question, Sinhalese cannot have the particle də in clause final position, as shown by the grammatical contrast between the sentences below:<sup>5</sup>

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5. There are two major classes of exceptions to this rule. (See Gair (1980)). First, when a wh phrase embedded in the complement clause of verbs like dannəwa 'know', əhuwa 'ask' etc. takes the embedded scope, the Q element də may show up either in argument position or in clause final position of the embedded clause, as shown in (i):

- (i) a. Chitra [ kau-də potə gatte kiyəla ] dannəwa.  
Chitra who-Q book bought that know  
'Chitra knows who bought the book.'
- b. Chitra [ kauru potə gatta-də kiyəla ] dannəwa.  
Chitra who book bought-Q that know  
'Chitra knows who bought the book.'

Second, if a wh phrase is quantificational in itself, then the placement of a Q element in argument position is not obligatory, as illustrated below:

- (ii) a. kiidenek aawa-də?  
how many came-Q  
'How many people came?'
- b. kiidenek-də aawe?  
how many-Q came

- (8) a. kau-də enne?  
 who-Q come  
 'Who will come?'
- b. \*kauru enəwa-də?  
 who come-Q  
 'Who will come?'

At first glance, it might appear that the Q element must be contiguous with a wh phrase, but this is not necessarily the case. In some cases, the Q element is obligatorily separated from a wh phrase, as exemplified below:

- (9) a. Chitra [ kauru ekkə ]-də kataa kəlee?  
 Chitra who with -Q talk did  
 'With whom did Chitra talk?'
- b. Chitra [ kohee indan ]-də enne?  
 Chitra where from -Q come  
 'Where does Chitra come from?'

Note that sentences like (9) do not have corresponding wh interrogations in which the Q element is contiguous with a wh phrase, as the ungrammaticality of (10) illustrates:

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 'How many people came?'

There is no restriction on the Q particle placement in the case of yes-no questions. Thus, in Sinhalese, it is possible to have a clause final də in a yes-no question, as shown in (iii):

- (iii) oyaa pot-ak gatta-də?  
 you book-INDEF bought-Q  
 'Did you buy a book?'

- (10) a. \*Chitra [ kau-də ekkə ] kataa kəlee?  
 Chitra who-Q with talk did  
 'Who did Chitra talk with?'  
 b. \*Chitra [ kohee-də indan ] enne?  
 Chitra where-Q from come  
 'Where does Chitra come from?'

In order to block an unwanted application of the Q element placement and appropriately distinguish between possible and impossible cases, it will be sufficient to require that the constituent indicated by the Q particle undergo Wh fronting at the level of LF.<sup>6</sup>

In the case of (9a), for instance, the PP containing a wh phrase is essentially an adjunct and it can be assumed that the PP constitutes an island for movement. If the Q element is placed on the whole island, the whole PP can be understood as a constituent which undergoes Wh movement. Since the movement of the entire island does not involve a Subjacency violation, the sentence turns out to be grammatical. By contrast, if LF Wh fronting is not mediated by pied piping, namely, in a structure like (10a), where a Q particle is adjacent to the wh phrase, then the wh phrase alone is moved to a scope position upon the application of LF Wh move-

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6. When the Q particle də appears sentence-medially, the sentence is required to have an adnominal ending. This adnominal form of the predicate can be construed as indicating the scope (i.e. the landing site) of a wh phrase in the case of Sinhalese. The particle-predicate concord found in Sinhalese is quite analogous to the phenomena which have been referred to as 'kakari-musubi' in the tradition of Japanese grammar.

ment, and this movement violates Subjacency, (involving extraction out of the adjunct PP):<sup>7</sup>

- (11) a. [<sub>CP</sub> [<sub>PP</sub> kauru ekkə ]-də<sub>1</sub> [<sub>IP</sub> Chitra t<sub>1</sub> kataa kəlee ]]  
b. [<sub>CP</sub> kau-də<sub>1</sub> [<sub>IP</sub> Chitra [<sub>PP</sub> t<sub>1</sub> ekkə ] kataa kəlee ]]

Given the assumption that the sequence marked by the Q element is susceptible to Wh fronting at LF, it follows that the wh question in (10a) is ruled out as unacceptable, while (9a) is found fully acceptable without a Subjacency violation. If our analysis is correct, then this means that the LF strategy of pied piping is reflected in the strings of a surface form in the case of Sinhalese, owing to the presence of a Q element which attaches to a constituent raised by LF Wh movement.

With this as a background, let us consider some extreme cases of pied piping. As we will see below, the correctness of our claim with regard to LF Wh movement is robustly confirmed. First, observe the grammaticality of the following examples, in which a wh phrase appears inside a complex NP:

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7. In this particular case, there are several other conceivable reasons for blocking the adjacency of the Q particle to the wh phrase. To take one example, we might argue that the correct generalization is that the Q element must attach to a maximal projection after a postposition. However, since PP is usually seen as an adjunct island at least in this language, and since this analysis offers us a uniform account in terms of Subjacency, this paper adopts the assumption that PP is an island for the purpose of movement.

- (12) a. oyaa [ kauru liyəpu ] potə-də kieuwe?  
 you who wrote book-Q read  
 'You read the book that who wrote?'
- b. Chitra [ kauru aawa kiənə ] katəkataawə-də əhuwe?  
 Chitra who came that rumor-Q heard  
 'Chitra heard the rumor that who came?'

Examples (12a) and (12b) involve a relative clause and a noun complement, respectively. In both cases, the Q element attaches to the island which contains a wh phrase, and these sentences are fully acceptable. In comparison to this, if the Q morpheme is adjacent to the wh phrase, which is contained within the island, then the sentence turns out to be ill-formed:

- (13) a. \*oyaa [ kau-də liyəpu ] potə kieuwe?  
 you who-Q wrote book read  
 'You read the book that who wrote?'
- b. \*Chitra [ kau-də aawa kiənə ] katəkataawə əhuwe?  
 Chitra who-Q came that rumor heard  
 'Chitra heard the rumor that who came?'

The examples in (13) show the outlawed pattern of unacceptability derived from a Subjacency violation, as is expected from our analysis. A comparison between (12) and (13) clearly shows that LF Wh movement is susceptible to Subjacency.

A further case demonstrating LF pied piping arises in



constructions with an adjunct clause within which a wh phrase is contained. In such cases, the Q element must be adjoined to the adjunct clause, for an adjunct clause constitutes an island for the purpose of movement:

- (14) [ kauru enə kotə ]-də Ranjit paadam kəramin hitiye?  
 who came time -Q Ranjit study doing was  
 'Ranjit was studying when who came?'

As shown above, the sentence in which the Q morpheme is adjoined to the adjunct clause is well-formed. In contrast, the sentence turns out to be ill-formed if the Q morpheme appears inside the adjunct clause:

- (15) \*[ kau-də enə kotə ] Ranjit paadam kəramin hitiye?  
 who-Q came time Ranjit study doing was  
 'Ranjit was studying when who came?'

Again, these examples illustrate that the positioning of the Q morpheme is taken as a determinant of the syntactic well-formedness of wh interrogations in Sinhalese. The relevant array of data immediately suggests that LF Wh movement should be constrained by Subjacency in a way analogous to S-structure Wh movement.

Let us now turn to the so-called 'Subject' Condition. Interestingly, in the case of Sinhalese, we do not find asymmetries between subject and object with regard to the attach-

ment of a Q element. The fact of the matter is that it is simply impossible to place a Q element next to a wh phrase, regardless of whether the NP containing a wh phrase is located in subject position or in object position, as illustrated below:

- (16) a. \*Ranjit kaa-ge-də potə kieuwe?  
 Ranjit who-GEN-Q book read  
 'Whose book did Ranjit read?'  
 b. \*kaa-ge-də potə wəɖipurə kiewenne?  
 who-GEN-Q book often is read  
 'Whose book is often read?'

The fact indicates that both subject and object should constitute islands for LF extraction. In these cases, then, the Q element də must attach to the entire NP:

- (17) a. Ranjit kaa-ge potə-də kieuwe?  
 Ranjit who-GEN book-Q read  
 'Whose book did Ranjit read?'  
 b. kaa-ge potə-də wəɖipurə kiewenne?  
 who-GEN book-Q often is read  
 'Whose book is often read?'

The grammatical contrast which we observe between (16) and (17) shows that a part of the subject NP and the object NP cannot be extracted via LF Wh movement.

Essentially the same pattern of distribution is found when a wh phrase is embedded in a də-nəɖɖə 'whether' clause

(i.e. Wh island). As expected from our analysis, again, it is not possible to place the Q element next to a wh phrase, as indicated by the ungrammaticality of the following sentence:

- (18) \*Ranjit [ Chitra kau-də ekkaragena aawa də-nəddə  
 Ranjit Chitra who-Q bring came whether  
 kiyəla ] danne?  
 that know  
 'Who does Ranjit know whether Chitra brought?'

If the entire də-nəddə 'whether' clause is pied piped by the Q element, then the sentence turns out to be well-formed, as shown by the acceptability of (19):

- (19) Ranjit [ Chitra kauru ekkaragena aawa də-nəddə  
 Ranjit Chitra who bring came whether  
 kiyəla ]-də danne?  
 that -Q know  
 'Ranjit knows whether Chitra brought who?'

Again, the Sinhalese facts suggest that LF pied piping is responsible for the apparent lack of Subjacency effects at LF, and that LF Wh movement is constrained by Subjacency.

Presumably, the most striking evidence in favor of our view can be obtained by looking at sentences which are concerned with bridge and non-bridge verbs. In regard to Wh movement out of a lower clause of these verbs, we can state, as a descriptive generalization, that extraction of a wh phrase from a lower clause is possible with a bridge verb,

but not with a non-bridge verb, as illustrated by the English examples below (cf. Stowell (1981a, 1981b)):

- (20) a. Who did you say that John saw?  
b. ??Who did you whisper that John saw?

The following Sinhalese examples are, however, both grammatical and do not show a familiar contrast in acceptability regardless of verb type:

- (21) a. Ranjit [ Chitra mokaa-tə gæhuwa kiyəla ]-də kiiwe?  
Ranjit Chitra what-DAT hit that -Q said  
'Ranjit said that Chitra hit what?'
- b. Ranjit [ Chitra mokaa-tə gæhuwa kiyəla ]-də  
Ranjit Chitra what-DAT hit that -Q  
kendiruwe?  
whispered  
'Ranjit whispered that Chitra hit what?'

What is notable about the sentences in (21) is that in both cases, the Q morpheme is adjoined to the complement clause of the verb. Not surprisingly, the sentences are well-formed, for the movement of the whole clause does not cause a Subjacency violation. In contrast to this, the expected contrast of bridge versus non-bridge verbs emerges if the Q particle is directly adjoined to a wh phrase inside a subordinate clause:

- (22) a. Ranjit [ Chitra mokaa-tə-də gəhuwa kiyəla ] kiiwe?  
 Ranjit Chitra what-DAT-Q hit that said  
 'What did Ranjit say that Chitra hit?'
- b. \*Ranjit [ Chitra mokaa-tə-də gəhuwa kiyəla ]  
 Ranjit Chitra what-DAT-Q hit that  
 kendiruwe?  
 whispered  
 'What did Ranjit whisper that Chitra hit?'

In the sentences in (22), the kind of movement required in the derivation is LF fronting of the wh phrase mokaa-tə. As this wh phrase must be extracted from the lower clause at the LF level in the sentences in (22), the ill-formedness of (22b) must come from an illicit LF movement, which extracts mokaa-tə from the lower clause of a non-bridge verb. The fact that Sinhalese exhibits the familiar contrast of acceptability between bridge and non-bridge verbs in (22) gives us a clear indication that extraction of a wh phrase from a lower clause of a non-bridge verb, but not of a bridge verb, yields a Subjacency violation.<sup>8</sup>

The distinguishing properties of Sinhalese wh questions demonstrated above automatically fall out from the analysis which crucially utilizes the system of pied piping in the LF derivation of Wh movement. Consider, for example, the LF configuration in (23b) which is derived from (23a) via LF Wh fronting of a complex NP:

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8. For reasons unclear to me, example (22b) is completely out, while an English counterpart is marginal.

- (23) a. [ Ranjit kohedi gattə ] potə-də hondə?  
           Ranjit where bought book-Q interesting?  
           'The book which Ranjit bought where was interesting?'
- b. [<sub>CP</sub> [ Ranjit kohedi gattə ] potə-də<sub>1</sub> [<sub>IP</sub> t<sub>1</sub>  
           hondə ]]

The LF construal in (23b), where the entire island has been moved to SPEC of CP, is licit because Subjacency is not violated by LF preposing of the whole island. On the other hand, if the Q morpheme is attached to a wh phrase, then the movement of the wh phrase is necessitated even when it is embedded in an island. Then the following LF configuration arises from the LF movement of the wh phrase:

- (24) a. \*[ Ranjit kohedi-də liyəpu ] potə hondə?  
           Ranjit where-Q wrote book interesting  
           'Where was the book which Ranjit bought interesting?'
- b. [<sub>CP</sub> kohedi-də<sub>1</sub> [<sub>IP</sub> [ Ranjit t<sub>1</sub> liyəpu ] potə  
           hondə ]]

In the derivation of the LF structure in (24b), the wh phrase is raised to the COMP in the matrix clause.<sup>9</sup> The exportation

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 9. Here, it must be pointed out that a wh phrase cannot be doubly associated with Q elements. Presumably, we have some sort of locality condition, which requires that a wh word be associated with the 'closest' Q particle. This assumption must be correct in view of the ungrammaticality of the sentence below:

- (i) \*[ Ranjit kohedi-də gattə ] potə-də hondə?  
       Ranjit where-Q bought book-Q interesting  
       'The book that Ranjit bought where was interesting?'

of the wh phrase violates Subjacency, since it is extracted from a complex NP, which constitutes an island for movement. Therefore, (24a) is ruled out as a Subjacency violation. As illustrated above, the distribution of Sinhalese wh questions shows that movement of a wh phrase is not allowed over too long a distance even at LF, and this fact receives a ready explanation if Subjacency is held to be a constraint imposed on LF Wh movement.

### 3.2.2. Weak Crossover

An obvious question to ask now is whether there is any other positive evidence that supports the view that Sinhalese instantiates pied piping (and Wh fronting) in the mapping of S-structure onto LF. By way of answering this question, let us consider whether or not Sinhalese wh questions exhibit Weak Crossover effects. Since Weak Crossover can be taken to be symptomatic of the existence of a 'quantifier' rule, we can provide some evidence for the existence of LF Wh raising if we find Weak Crossover effects in Sinhalese wh questions.

In order to see the effect of Weak Crossover, it must first be pointed out that in the case of Sinhalese, a null

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If it were possible for kohedi to be related to the outer Q element, we would expect the grammaticality of (i). But the sentence is ungrammatical, and this shows that only the closest Q element can license a wh phrase.

pronominal can be construed as a bound pronoun, as shown below:

- (25) a. kauru-t<sub>1</sub> [ Ranjit e<sub>1</sub> hambə wennə issella ]  
 who-Q        Ranjit        meet    become before  
 kataa        kiiwa.  
 complaint said  
 'Everyone complained before Ranjit met (him).'
- b. kau-də<sub>1</sub> [ Ranjit e<sub>1</sub> hambə wennə issella ]  
 who-Q        Ranjit        meet    become before  
 kataa        kiiwe?  
 complaint said  
 'Who complained before Ranjit met (him)?'

In both cases, the indexed zero pronoun can be interpreted as bound by the coindexed quantified expression, and this fact shows that a zero pronoun qualifies as a bound variable (if it is within the scope of a quantifier).

Now, bearing in mind that typical Weak Crossover obtains in the configuration in which the trace of a quantifier arising from Wh fronting fails to c-command a coindexed lexical variable and vice versa (cf. Koopman and Sportiche (1982)), consider the contrast in acceptability between the sentences below:<sup>10</sup>

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 10. Although a Weak Crossover effect is observed in an example like (26b), this effect vanishes if the object NP is fronted by scrambling:

- (i) monə-potə-də<sub>1</sub>, Chitra [ Ranjit e<sub>1</sub> kiəwannə issella ] t<sub>1</sub>  
 what book-Q    Chitra    Ranjit Ø    read        before  
 kieuwa?  
 read  
 'Chitra read what book before Ranjit read (it)?'

Hoji (1985) argues, based on Japanese examples, that a sen-



- (26) a. Chitra [ Ranjit e<sub>1</sub> kiəwanna issella ] ee-potə<sub>1</sub>  
 Chitra Ranjit Ø read before that-book  
 kieuwa.  
 read  
 'Chitra read that book before Ranjit read (it).'
- b. \*Chitra [ Ranjit e<sub>1</sub> kiəwanna issella ]  
 Chitra Ranjit Ø read before  
 monə-potə<sub>1</sub>-də kieuwe?  
 what-book-Q read  
 'What book did Chitra read before Ranjit read (it)?'

Since the contrast in acceptability between (26a) and (26b) is quite comparable to what we observed for English examples below, it seems reasonable to attribute the ungrammaticality of (26b) to Weak Crossover:

- (27) a. His<sub>1</sub> mother loves John<sub>1</sub>.  
 b. \*Who<sub>1</sub> does his<sub>1</sub> mother love?

If our analysis is correct, the grammatical contrast we find in (26) can be accounted for by the assumption that the wh word in (26b) is in fact fronted by LF Wh fronting, yielding a configuration in which an operator binds two variables, neither of which c-commands the other.

The ungrammatical status of (26b) is garnered from the

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 tence like (i) a parasitic gap construction and that the parasitic gap is licensed by the scrambling of the wh phrase into A-bar position. Saito (1990), on the other hand, argues that since the gap does not show a Subjacency effect, it cannot be a parasitic gap. For discussion on this issue, see Saito (1985, 1990), and Hoji (1985).

LF construal which violates Weak Crossover. If our discussion is correct, then it is predicted that we will not observe any Weak Crossover effect if the trace arising from LF Wh movement c-commands the zero pronominal. This is indeed correct, as shown in (28):

- (28) monə-potə<sub>1</sub>-də [ Ranjit e<sub>1</sub> kiəwanna issella ]  
 what-book-Q      Ranjit Ø    read      before  
 wiknunee?  
 was sold  
 'What book was sold before Ranjit read (it)?'

The contrast in acceptability between (26b) and (28) shows that the structural notion of 'c-command' is crucial for the determination of grammaticality. It is then quite clear that the set of data cited here can be best analyzed by treating wh phrases as (quasi-)quantifiers, which are moved by LF Wh movement.

The same facts obtain for the wh questions that contain a wh phrase within a syntactic island. It is argued in Choe (1987) and Nishigauchi (1986, 1990) etc. that LF movement of a pied piped constituent can be evidenced by looking at a Weak Crossover effect in a wh question with a pied piped constituent. (cf. Hasegawa (1986), Pesetsky (1987)) As we will see below, this argument goes through in Sinhalese as well. Now, let us consider the grammatical contrast of the following sentences:

- (29) a. Chitra [ Ranjit e<sub>1</sub> gannə issella ] [ Ram liyəpu ]  
 Chitra Ranjit ∅ buy before Ram wrote  
 potə<sub>1</sub> wikka.  
 book sold  
 'Chitra sold the book that Ram wrote before  
 Ranjit bought (it).'
- b. \*Chitra [ Ranjit e<sub>1</sub> gannə issella ] [ kauru liyəpu ]  
 Chitra Ranjit ∅ buy before who wrote  
 potə<sub>1</sub>-də wikke?  
 book-Q sold  
 'Chitra sold the book that who wrote before Ranjit  
 bought (it)?'

The same pattern of distribution as (26) shows up in the pair of sentences above, in which the simple NPs ee-potə 'that book' and monə-potə 'what book' are replaced with the complex NPs [ Ram liyəpu ] potə 'the book that Ram wrote' and [ kauru liyəpu ] potə 'the book that who wrote', respectively. The familiar pattern of acceptability exhibited in these sentences shows that (29b), but not (29a), involves the LF movement of a pied piped constituent. In (29a), no conceivable movement of the NP [ Ram liyəpu ] potə is involved in the LF component, so that the coindexing of the entire NP with the zero pronoun is permissible. In the case of (29b), in contrast, such coindexing is forbidden. The fact shows that the NP [ kauru liyəpu ] potə, which is pied piped by the Q element, undergoes Wh fronting at the LF level and the movement yields a structure with the Weak Crossover configuration, as in (30):

- (30) [ [ kauru liyəpu ] potə-də<sub>1</sub> ] [ Chitra [ Ranjit e<sub>1</sub> gannə

issella ] t<sub>1</sub> wikke ] ]

Furthermore, just as is the case with (28), which is associated with the movement of the simple wh phrase monə-potə, we do not observe any Weak Crossover effect, if the whole complex NP [ kauru liyəpu ] potə is displaced from the subject position by LF Wh movement, as demonstrated by (31):

- (31) [ kauru liyəpu ] potə<sub>1</sub>-də [ Ranjit e<sub>1</sub> gannə issella ]  
      who wrote book-Q Ranjit Ø buy before  
      wikinunee?  
      was sold  
      'The book that who wrote was sold before Ranjit  
      bought (it)?'

The peculiar behavior of the zero pronoun found in (29b) and (31) automatically follows if the coindexing relation between the complex NP and the zero pronominal is analogous to that of the simple NP and the zero pronoun in (26b) and (28). Importantly, if the whole island is analyzed as a constituent to get raised by Wh movement, the notion of Weak Crossover can be straightforwardly generalized to (29b) and (31), and all the properties of Weak Crossover observed above follow in a straightforward manner. Unless the whole complex NP is postulated to undergo Wh movement by way of LF pied piping, there would be no easy way of explaining the contrast in grammaticality that obtains between (29b) and (31).<sup>11</sup>

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11. If we look at Weak Crossover effects alone, it is possible to argue, as suggested by Hasegawa (1986), that the

### 3.2.3. Short Answer Formation

Another interesting piece of evidence which is often discussed in the literature as support for the pied piping analysis comes from the fact that the structure of pied piping is, to some degree, reflected in the form of short answers. First, consider the following:

- (32) Q: Chitra kaa-tə-də potə dunne?  
Chitra what-DAT-Q book gave  
'Who did Chitra give a book to?'
- A: a. Chitra Ram-tə potə dunna.  
Chitra Ram-DAT book gave  
'Chitra gave a book to Ram.'
- b. Ram-tə.  
Ram-DAT  
'To Ram.'

In general, a simple wh question like that in (32) can be answered either in a full-fledged form or in an elliptical form. The first answer in (32), in which the whole sentence is repeated along with the value of the wh phrase, constitutes a full-fledged answer. The second answer, which

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movement of the entire complex NP is triggered by QR. However, since a constituent moved by Wh raising is indicated by an interrogative Q element in the case of Sinhalese, we are allowed to state that in this particular case, the raising of the entire constituent is effected by Wh movement (rather than QR).

specifies only the identity of the value of the wh phrase, is a short answer to the question.

The data which is taken as support for the pied piping analysis may be deduced from the fact that when a wh word is embedded in an island, a short answer which only specifies the value of the wh phrase is, in most cases, unacceptable. The possibility of a short answer in (33) starkly contrasts with that of (32), and the starred short answer illustrates the extent of the phenomenon:

(33) Q: [ Chitra kaa-tə dunna ] potə-də Ranjit hoyagatte?  
Chitra who-DAT gave book-Q Ranjit found  
'Ranjit found the book which Chitra gave who?'

A: a. \*Ram-tə.  
Ram-DAT  
'To Ram.'

A: b. [ Chitra Ram-tə dunnə ] potə.  
Chitra Ram-DAT gave book  
'The book that Chitra gave to Ram.'

In reply to a wh question like (33), it is not appropriate to give a short answer which provides only the value of the wh phrase. The requirement of (33b) as a minimal answer appears to indicate that the wh question in (33) is a question concerning the identity of the person (its identification is made through the value of the wh phrase).

Choe (1987), Nishigauchi (1986, 1990) and Pesetsky (1987), among others, argue that the requirement that the

preferable answer to the question be one which spells out all the material in the island appears to be readily captured on the assumption that the constituent which is moved into COMP in the formation of the LF construal for the wh question in (33) is reflected in the form of a short answer of the type given in (33b). It must be admitted that the condition placed on this type of question-answer pair is certainly pragmatic in nature, but the argument gives us some indication that a wh phrase pied pipes the island in LF in which it occurs.

Notwithstanding an interesting argument for the pied piping this diagnostic test offers us, it is not too reliable, since the requirement for a minimal answer does not hold for a wh question which contains a D-linked wh phrase, as illustrated below:<sup>12</sup>

(34) Q: (Context: among John, Mary and Ram)

[ Chitra koi-ekkenaa-tə dunnə ] potə-də Ranjit  
 Chitra which-person-DAT gave book-Q Ranjit  
 hoyaaagatte?  
 found  
 'Ranjit found the book that Chitra gave to which  
 person?'

A: a. Ram-tə.

Ram-DAT  
 'To Ram.'

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12. The term 'D-linked (or Discourse-linked)' is used when we refer to a set of wh phrases whose values can be determined by context. See Pesetsky (1987).

b. [ Chitra Ram-tə dunnə ] potə.

Chitra Ram-DAT gave book  
'The book which Chitra gave to Ram.'

In the case of the question in (34), which contains a D-linked wh phrase, possible answers to the question, somewhat unexpectedly, include one which merely spells out the value of the wh phrase. On the basis of this observation, Pesetsky (1987) claims that D-linked wh phrases may receive scope without movement and that Subjacency should therefore be irrelevant. However, inspection of Sinhalese data clearly shows that his argument is not entirely correct. In the question in (34), pied piping takes place, even though a wh phrase is D-linked, and in this case, the pied piped structure of the question is not mirrored by a felicitous answer. This shows that we cannot draw too much on possible elliptical answers to argue for LF pied piping.

This conclusion can be further reinforced by the fact that the Q morpheme cannot be directly adjoined to the wh phrase, regardless of whether the wh phrase is D-linked or not, i.e. whether an appropriate context is available for the wh phrase or not:

(35) \*[ Chitra koi-ekkenaa-tə-də dunnə ] potə Ranjit  
Chitra which-person-DAT-Q gave book Ranjit  
hoyaagatte?  
found  
'Ranjit found the book that Chitra gave to which  
person?'



According to Pesetsky (1987), D-linked wh phrases are assumed to receive scope through unselective binding without movement, and so Subjacency should be irrelevant. If this assumption were correct, it would be anticipated that the above-cited example should be accorded the same grammatical status as the question in (34), but the result is, nevertheless, quite ungrammatical. The conclusion to be drawn here, then, is that inclusion of pragmatic factors sometimes undermines the argument for the pied piping analysis, and that we cannot depend too much on possible answers to argue for the presence or absence of LF pied piping.

### 3.3. Mechanism of Pied Piping

In the discussion to this point, we have been exploiting the idea that pied piping is responsible for the apparent lack of Subjacency at the LF level. The question to be addressed at this point is what determines the pied piped structure of a wh question. In order to handle the relevant array of data, what needs to be formulated is a 'pied piping' rule to specify the sequence of strings moved by LF Wh fronting.

In providing an answer, it is important to recognize that in the case of Sinhalese, the Q morpheme də is used to mark the constituent which is subject to Wh movement. In

view of this fact, it appears reasonable enough to assume that pied piping, essentially, involves insertion of a question-domain marker, which determines the quantificational domain of a wh phrase, (henceforth a 'Q-domain' marker), and that the sequence of strings marked by the Q-domain marker undergoes LF Wh fronting and is moved to a position where a wh phrase can take scope.<sup>13</sup>

As we shall see below, once the idea of Q-domain marker suffixation to an island is accepted, the pied pipability of an island will simply follow as a consequence. As an illustration, let us consider the following abstract structures, in which XP, Q and S represent some maximal projection, a Q-domain marker and a scope position (S-marker), respectively:<sup>14</sup>

- (36) a. [CP [IP .....WH-Q .... ] S ]  
 b. [CP [IP ... [XP .. WH ..]-Q ... ] S ]

Suppose that the Q-domain marker may be adjoined either to a

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 13. This is also a reasonable way of handling LF pied piping in Japanese, alongside of Sinhalese, because the constituent raised by Wh movement is sometimes indicated by the Q morpheme ka in classical Japanese. Although the Q morpheme in Japanese now has completely shifted to clause final position, a remnant use of the Q morpheme as a Q-domain marker in classical Japanese gives us some indication that the abstract Q-domain marker actually exists even in Japanese. See Ogawa (1976-77).

14. The 'scope' position is intended to refer to an A-bar position into which a wh phrase is moved by Wh movement.

wh phrase or to any other maximal projection, and that whatever constituent the Q-domain marker adjoins to undergoes Wh movement at LF. In the case of (36a), the Q-domain marker adjoins to a wh expression, and then the wh phrase gets moved to the pre-IP position marked by S, as illustrated in (37):

(37) [CP WH-Q<sub>1</sub> [IP .....t<sub>1</sub> .... ] S ]

If the Q-domain marker is adjoined to some other maximal projection XP as in (36b), then the pied piping convention requires that the entire sequence of XP undergo Wh fronting at LF, since this maximal projection is construed by Wh raising as a 'relevant' wh phrase to undergo movement. If XP is moved to the scope position governed by the S-marker, we obtain the following LF configuration:

(38) [CP [XP .. WH .. ]-Q<sub>1</sub> [IP .....t<sub>1</sub> .... ] S ]

Since the presence of a Q-domain marker in the syntax allows us to determine the structure of pied piping, it can be assumed that suffixation of a Q-domain marker to an island is generally utilized in the pied piping convention when the island within which a wh phrase is contained must be analyzed as a wh expression to be moved.

A vital assumption of the proposed analysis is that suffixation of a Q-domain marker allows us to treat the island

in which a wh phrase appears as a wh expression to be moved by Wh fronting. The presence of a Q-domain marker is not necessarily visible on the sequence of surface strings, but since the presence of a Q-domain marker is attested in a language like Sinhalese, which implements the Q element də as a Q-domain marker, this is a reasonable and optimal way of handling the pied piping phenomena, and we can reasonably assume that this kind of marker universally exists in natural language. Aside from the problem of distinguishing between possible and impossible cases of pied piping, we can now maintain that the identification of a pied constituent is made through the formulas involving a Q-domain marker.<sup>15</sup>

#### 3.4. The Peculiarity of 'Why'

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 15. Strictly speaking, just as a Q morpheme is allowed to assign a wh phrase quantificational force either in A-position or in scope position, so the licensing of a pied piped constituency can be made either in 'in-situ' (i.e. pre-movement) site or in scope position, since, in the case of a concessive clause, a Q-domain marker appears in scope position, as illustrated in (i):

- (i) [ kauru aawa-t ] mamə pudumə wenawa.  
       who come-Q I surprise become  
       'No matter who comes, I will be surprised.'

In order to obtain the desired result, then, it might be necessary to state that the construal of a Q-domain marker with some maximal projection takes place either in S-structure or in LF, depending on construction type. Although we are not committed to the precise mechanism of pied piping in a concessive clause here, it must be admitted that pied piping can be licensed after movement of pied piped strings is invoked.

As the above discussion tacitly implies, the operation of pied piping should be exerted in a straightforward way for a very large set of wh phrases, since pied piping is, essentially, possible with any kind of wh phrase. An important exception to this rule is found in the class of wh phrases to which the Japanese wh expression naze 'why' belongs, and a wh phrase like naze consistently resists pied piping. Now that we have established the machinery of pied piping, we are in a position to provide an account of why a wh phrase like naze cannot be embedded in a syntactic island. First, consider the contrast in acceptability between the following two Japanese sentences:

- (39) a. [ dare-ga kai-ta ] hon-ga syuppan-sare-ta no?  
 who-NOM wrote book-NOM was published Q  
 'The book that who wrote was published?'
- b. \*[ sensei-ga naze kai-ta ] hon-ga  
 Teacher-NOM why wrote book-NOM  
 syuppan-sare-ta no?  
 was published Q  
 'The book that Teacher wrote why was published?'

These examples show that naze 'why', unlike dare 'who' is prohibited from appearing inside an island. Upholding the pied piping analysis, we take it that the contrast in grammaticality between these sentences obtains due to the fact that dare may pied pipe an island into COMP, while naze must be extracted from a syntactic island. To accommodate the data in (39) in the present analysis, then, all we need to

assume is that a wh interrogation with naze gives rise to an LF representation distinct from a wh question with dare, as illustrated in (40):

- (40) a. [<sub>CP</sub> [ dare-ga kai-ta ] hon-ga<sub>i</sub> [<sub>IP</sub> t<sub>i</sub> syuppan-sare  
-ta ] no ]  
b. [<sub>CP</sub> naze<sub>i</sub> [<sub>IP</sub> [ sensei-ga t<sub>i</sub> kai-ta ] hon-ga  
syuppan-sare-ta ] no ]

In the case of (40a), the 'relevant' wh phrase which undergoes Wh movement is the entire island, and the sentence does not involve a derivational step which violates Subjacency. In (40b), in contrast, naze is extracted from within the relative clause, and in this derivation, the movement of naze violates Subjacency. As illustrated above, the contrast in acceptability between the sentences in (39) is accounted for by assuming that naze is not susceptible to the rule of pied piping.

There are a number of possibilities to which this difference might be attributed. Two possibilities are suggested in the literature. One possible approach is to make Subjacency sensitive to an argument-adjunct distinction. This type of distinction stems from a discussion of the ECP, and this view was defended, in particular, by Huang (1982a, 1982b). A straightforward way to incorporate this insight into the present context is to postulate that pied piping is

sensitive to the argument-adjunct distinction. If we follow this line of reasoning, the key mechanism to explain the contrast would be an ECP type constraint.<sup>16</sup>

The other possibility is to ascribe the observed contrast to categorial features such as [+N] and [-N]. This avenue has been pursued by Nishigauchi (1986, 1990), where a crucial use of the categorial features has been made when discussing the non-pied-pipability of a wh question involving naze. Nishigauchi argues that a wh phrase, if it is embedded in a complex NP, makes its feature percolate up to the top of the complex NP after (or upon) the internal LF fronting of the wh phrase. Under his analysis, the possibility of pied piping depends on whether or not the percolation process is legitimized. In order to ensure that pied piping does not apply to naze, he postulates that naze possesses the feature [-N], and other regular wh phrases the categorial feature [+N]. Under his account, if naze appears inside a complex NP, then the features associated with naze never reach the top NP node which has the feature [+N], because of a mismatch of categorial features. The pied piping operation associated with naze is, thus, by no means legitimized, thereby resulting in a failure to obtain the pied piping effect in LF.

As we will discuss below, these analyses, despite ini-

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16. One possible way to account for the fact is to stipulate that pied piping is possible with a wh phrase which is lexically governed, but not with a wh phrase which is not lexically governed.

tial appeals, fail to provide a key to the condition which determines the well-formedness of LF pied piping, and it will be shown in the following that there is good reason to believe that treating pied piping as sensitive to the argument-adjunct dichotomy or categorial features is simply wrong. Instead, we suggest that an interesting alternative solution to the problem at issue presents itself within the confines of the theory developed thus far, since we are claiming that the constituency of pied piping is structured in terms of a Q-domain marker, which we assume to exist in natural language. To be specific, what we will propose in this section is that the 'why' type wh expression constitutes a unique class and is simply exceptional in the sense that it is not permitted to undergo Q-domain marker suffixation.

To make matters concrete, let us now turn to examples in Sinhalese. The data from Sinhalese presents particularly interesting evidence in support of our claim, because we can clearly observe the effect of LF pied piping, by just looking into the status of a Q element. Keeping in mind that it is the Q element də that serves as a Q-domain marker in Sinhalese, consider the following simple wh questions in Sinhalese:

- (41) a. Chitra æi paatiya-tə naawe?  
 Chitra why party-DAT not came  
 'Why didn't Chitra show up at the party?'
- b. Chitra monəwa-də karanne?



Chitra what-Q is doing  
'What is Chitra doing?'

Interestingly, we see from (41) that a remarkable difference between the wh phrase æi 'why' and other wh phrases like monəwa 'what' is apparent in the way the Q element is realized in syntax. While insertion of the Q particle is required of a wh phrase like monəwa, the wh word æi does not derivationally combine with the Q element. Since æi is required to stand alone without combining with a Q element, the sentence loses its grammatical status if the wh phrase æi occurs with the Q element, as exemplified below:

- (42) \*Chitra æi-də paatiya-tə naawe?  
Chitra why-Q party-DAT not came  
'Why didn't Chitra turned up at the party?'

In contrast, the presence of the Q morpheme is obligatory with a wh phrase like monəwa, and the sentence is unacceptable if it does not occur in combination with a Q element in syntax, as shown below:

- (43) \*Chitra monəwa karanne?  
Chitra what is doing  
'What is Chitra doing?'

The significant fact to be noticed here is that the wh phrase æi is proscribed from occurring with a Q element, which

serves as a Q-domain marker.

The apparent anomaly of xi may be deduced from the assumption that xi amalgamates its associated Q-domain marker in its lexical entry. This is a perfectly plausible assumption, especially, in view of the fact that xi can serve as a quantificational expression without combining with a Q element. To some extent, this view is buttressed by the fact that a variant of xi, i.e. mokədə, indeed includes the Q element də in it. In any event, the important point to note here is that the wh word xi is subject to a syntactic constraint disallowing its co-occurrence with a Q-domain marker.<sup>17</sup>

Recall now that under our analysis of pied piping, the grammatical operation of pied piping should be made possible only when a wh phrase can be construed with a Q-domain marker. Since xi is distinguished from other common wh phrases in that it cannot be associated with a Q element, it is naturally expected that xi, by virtue of its inability to combine with a Q element, will not trigger any syntactic ef-

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17. The analysis presented here is, of course, the most simple view. It must be admitted that we do not, at present, have a fully satisfactory answer to the question of what principle determines the distribution of a Q-domain marker (in Sinhalese). Incidentally, notice that Sinhalese has another wh word that incorporates the Q element in the lexical entry. This is the wh word kiiyədə 'how much', and this wh phrase syntactically pattern exactly like xi. The task of establishing the principle determining the distribution of the Q element would require further research and go well beyond the scope of this paper, so that we will leave this question open for further research.

fect of pied piping, and that the wh word æi will therefore be prevented from appearing in a syntactic island. This prediction is, in fact, borne out, as evidenced below:

- (44) \*oyaa [ Chitra æi gattə ] potə kieuwe?  
you Chitra why bought book read  
'You read the book that Chitra bought why?'

The fact that example (44), in which æi is embedded inside a complex NP, is ungrammatical gives us a good indication that æi cannot pied pipe the island. Furthermore, notice that since æi inherently lacks the forms in which it is combined with a Q element, the addition of a Q-domain marker does not help:

- (45) \*oyaa [ Chitra æi gattə ] potə-də kieuwe?  
you Chitra why bought book-Q read  
'You read the book that Chitra bought why?'

The fact that the wh word æi in Sinhalese in no way participates in pied piping provides us with a piece of solid evidence that pied piping must be effected by the suffixation of a Q-domain marker. As is clear from examples involving æi, the presence of an overt Q-domain marker is required in the syntactic component in order for the formation of pied piping to take place.

The thesis that the behavior of pied piping hinges on the distribution of a Q-domain marker is preferred over any

claims crucially relying on the argument-adjunct distinction or categorial features. As is obvious, one of the main strengths of our analysis is that our analysis readily accounts for the fact that wh phrases, to the exclusion of xi, generally pattern alike with regard to pied piping, irrespective of whether they are arguments or adjuncts, and can be embedded in a syntactic island, as shown in (46):

- (46) a. [ Ranjit kohedi gattə ] potə-də hondə?  
 Ranjit where bought book-Q interesting  
 'The book that Ranjit bought where was interesting?'
- b. [ Ranjit kawəda gattə ] potə-də hondə?  
 Ranjit when bought book-Q interesting  
 'The book that Ranjit bought when was interesting?'

Note that if we regard an ECP type constraint as grammatically crucial for the determination of pied piping, taking the argument-adjunct dichotomy as primitive, we will necessarily be faced with the problem of accounting for the well-formedness of the above-noted sentences. Obviously, wh phrases like kohedi 'where' and kawəda 'when' are adjuncts, and these sentences should be ruled out as unacceptable due to an ECP violation if we follow this sort of analysis, but the sentences are well-formed. This is an apparent contradiction.

In order to rescue the hypothesis, it might be postulated that wh phrases such as kohedi etc. are lexically governed by 'invisible' postpositions, in opposition to xi,

which is never lexically governed, as was first proposed by Huang (1982b). One might also devise some other rules to yield the correct results, taking the argument-adjunct dichotomy as crucial for pied piping.<sup>18</sup> But since the pied pipability of an island is, as is clearly exemplified in Sinhalese, correlated with the presence or absence of a Q-domain marker, rather than the argument-adjunct distinction, this approach is not well-motivated and does not appear to provide a real answer to the problem. (The availability of pied piping in the kohedi and kawəda questions in Sinhalese clearly shows that the machinery of Q element placement plays a key role in determining the grammaticality of wh questions which have wh phrases within islands, and that the acceptability of the sentences is not directly tied to the bipartite distinction between "argument" and "adjunct".)

In conjunction with the status of wh phrases, it must be stressed again that one of the distinctive properties of xi, when compared with other regular wh phrases, resides in the fact that xi cannot be construed with a Q element. In our conception, since the impossibility of pied piping with the

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 18. Another way to accommodate the data is to assume that wh phrases such as kohedi etc., as opposed to xi, enter into selectional restrictions on the verb, and receive  $\theta$  roles from the verb, even though they are adjuncts. Given this assumption, wh phrases like kohedi are expected to behave like argument wh phrases. This idea was suggested by Aoun, Hornstein, Lightfoot and Weinberg (1987), but this proposal is also hard to sustain, since the bipartite distinction between argument and adjunct is not correlated with the possibility of pied piping.

æi questions is rooted in the lack of a Q element that can combine with æi, the analysis immediately suggests that categorial features also be foreign to the mechanism of pied piping. A piece of suggestive evidence in favor of this view can be provided by the example in (47), which involves the pied piping of an adverbial adjunct clause:

- (47) Chitra [ kauru hambə unə hinda ]-də satuten inne?  
Chitra who meet became because-Q happy was  
'Chitra was happy because she met who?'

The fact that the adverbial adjunct clause in (47) is susceptible to pied piping poses a problem for Nishigauchi's treatment of pied piping in terms of categorial identity, because the adjunct clause apparently does not carry the feature [+N]. Instead, the feature carried by the adverbial adjunct (on his account) can be viewed as [-N], for this sort of adjunct clause can be used as an answer to a question with æi. Under the assumptions held by Nishigauchi (1986, 1990), the prohibition against pied piping should be in force in the case at hand. If the feature analysis were correct, it would be anticipated that the sentence in (47) should be ill-formed, but this is clearly not the case. It is, thus, clear that the possibility of pied piping cannot be adequately handled by categorial features.

The correctness of our claim can be ascertained by the

fact that when the wh word æi, which requires that the Q morpheme be absent in syntax, appears within an adverbial adjunct, the sentence is judged as unacceptable, as shown below:

- (48) \*Chitra [ Ranjit æi hambə unə hinda ] satuten inne?  
 Chitra Ranjit why meet became because happy was  
 'Chitra was happy because she met Ranjit why?'

Under Nishigauchi's account, it remains inexplicable why the above sentence, which has æi inside an adverbial adjunct, is ungrammatical, since the categorial features of æi and the entire clause are identical in this case.<sup>19</sup> This seems to suggest that a solution in terms of categorial features to explain the phenomena of pied piping is also beset with great difficulties. In effect, as is clearly seen in (48), pied piping in Sinhalese calls for the addition of a Q element to the island for the sentence to be well-formed, and this indicates that the availability of pied piping is correlated with the question of whether the quantificational domain of a wh phrase can be identified syntactically by the use of a Q-domain marker.

By the same token, the adequacy of the treatment of pied

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 19. Under Nishigauchi's analysis, the grammatical status of (48) depends on whether an intervening CP is [+N] or neutral with respect to its categorial feature. If the first option is adopted, the sentence is ruled out.

piping in our system can further be confirmed by the fact that we find no Subjacency effect in a sentence containing kohomə 'how', which can be construed with an overt Q-domain marker:

- (49) [ Ranjit kohomə gattə ] potə-də hondə?  
Ranjit how bought book-Q interesting  
'The book that Ranjit bought how was interesting?'

That kohomə is able to appear within a complex NP poses a problem for any analysis which is based on the categorial identity or the argument-adjunct distinction, since kohomə is an adverbial expression, which is, according to these criteria, categorized into the same class of wh phrases as æi. Unlike æi, however, kohomə can be combined with a Q element, which can specify the quantificational domain of a wh phrase and hence can pied pipe an island as in (49). This also illustrates that the determination of a pied piped constituent is carried out by the addition of a Q-domain marker, and that as long as a wh phrase is allowed to co-occur with an external Q-domain marker, it is possible to pied pipe an island.<sup>20</sup>

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20. This generalization holds true for monə heetuwak nisaa 'for what reason', as the grammaticality of (i) shows:

- (i) [ Ranjit monə heetuwak nisaa gattə ] potə-də hondə?  
Ranjit what reason for bought book-Q interesting  
'The book that Ranjit bought for what reason was interesting?'



Given the strong correlation between the attachment of a Q element and LF pied piping, it should be obvious that our analysis, which utilizes a Q-domain marker to define a pied piping constituent, is favored over the previous treatments in terms of the categorial identity or the argument-adjunct dichotomy, since the previous analyses fall short of accounting for the phenomena of pied piping in an intuitively satisfying manner. Inspection of data from Sinhalese, in particular, shows that the absence of pied piping effects with æi must be traced to the fact that æi cannot be combined with a Q-domain marker. Our discussion makes it clear that the simple rule of Q-domain marker suffixation identifying a pied piped constituent does all the work necessary for LF pied piping. The existence of a language like Sinhalese that employs a Q morpheme as a Q-domain marker strongly suggests that a syntactic identification of the structure of pied piping obtains in the grammar, independently of the mechanism of Wh fronting.

### 3.5. Internal Structure: A Conceptual Issue

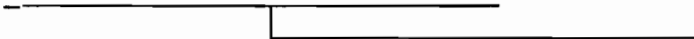
The overall picture that has emerged from the discussion of LF pied piping in Sinhalese is that pied piping can be effected by the addition of a Q-domain marker, which we claim to determine the quantificational domain of a wh phrase. In this analysis, pied piping is conceived of as an operation

which interprets the scope of a wh phrase within an island by raising the island. If the rule of pied piping is invoked, then the entire island containing a wh phrase is interpreted as if it were a wh phrase. In the case of pied piping, the wh phrase inside the island is merely regarded as a part of a 'larger' wh expression, namely, the island, and the whole island can thus be moved into SPEC of CP, in place of the wh phrase.

The major appeal of the present analysis is that the theory allows us to regard the whole island as a wh expression whose value-defining part is the wh phrase. Under our treatment, since pied piping is regarded as a case of reanalysis, where an island is analyzed as a wh expression to move in place of a wh word, it is expected that the wh word, which is on the island, should not be affected by the rule of Wh fronting. By our account, the LF structure into which (50a) is converted is (50b):

(50) a. oyaa [ kauru liyəpu ] potə-də kieuwe?  
 you who wrote book-Q read  
 'You read the book that who wrote?'

b. [<sub>CP</sub> [ kauru liyəpu ] potə-də<sub>1</sub> [<sub>IP</sub> oyaa t<sub>1</sub> kieuwe ]]



Notice that our analysis claims that pied piping is possible if the entire island is identifiable as a sequence of strings that is affected by Wh fronting, as a consequence of the

presence of a Q-domain marker. This being so, our system, which implements a Q-domain marker to define a pied piped constituent, can dispense with any operations of raising a wh phrase inside the island, and in this analysis, pied piping can be made possible, with no further movement required.

This analysis carries the implication that in a sentence like (50a), the wh word kauru, which is contained within the complex NP, does not stand in a government relation with the scope assigning element (even in LF). Since movement of a wh word is replaced with movement of an island in the case of pied piping, what should be governed by the scope indicator (at LF) is the entire island [ kauru liyəpu ] potə, which we assume to move into COMP in the case of (50).<sup>21</sup> Under our account, in fact, we can claim that since the wh word kauru, which is located inside the complex NP, does not possess the status of a wh quantifier (as a result of reanalysis), no Wh movement is required of the wh word (throughout derivations), and that kauru, though it has a morphological shape of a wh quantifier, does not have a quantificational force, and in consequence, does not undergo Wh movement.

If the premise that wh phrases are, in general, parti-

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21. If it is assumed that Wh movement is invoked by the requirement of SPEC-head agreement, we must assume that there exists an invisible scope indicator, which licenses a wh phrase at the LF level, even in the case of Sinhalese. In effect, since scope is marked by the adnominal form of a predicate in this language, it is reasonable to assume that such a scope indicator exists in Sinhalese.

tioned into two classes, depending on whether or not they undergo Wh movement (either in S-structure or in LF), is accepted, then the current analysis comes to entail that there should be an intrinsic connection between the well-formedness of wh-in-situ and the pied pipability of an island. The validity of this analogy, in fact, can be confirmed by English examples. All in all, wh phrases which are only classified as quantifiers (i.e. those that are not interpretable in D-structure positions) are not allowed to pied pipe an island, as illustrated below:

- (51) a. \*For why did John leave?  
b. \*By how did John go to the concert?

- (52) a. \*Who left early why?  
b. \*Who left early how?

In contradistinction to this, ordinary wh words can not only instantiate pied piping, but also are interpretable in 'in-situ' positions (if an appropriate environment is furnished with them), as illustrated below:

- (53) a. With whom did John talk?  
b. From where did John come?

- (54) a. Who talked with who?

b. Who came from where?

This fact immediately suggests that the availability of pied piping is, to a large extent, reducible to the question of whether a particular wh phrase is eligible for remaining in place (without movement). If this is correct, the analysis further implicates that Wh movement may void the effect of Subjacency as long as a wh phrase which appears inside an island is not affected by Wh fronting. (In Chapter 5, we will construct a demonstration that a wh phrase within an island, in fact, is not susceptible to Wh movement, and present some arguments for the claim that LF pied piping can be optimally characterized if we assume that a wh phrase embedded in an island is not moved by Wh movement at all.)

3.6. More on Short Answer Formation: A Case of Japanese

The discussion on short answer formation has played a prominent role in providing support for the pied piping analysis, and it is often claimed, especially on the basis of data in Japanese, that the structure of pied piping is mirrored by felicitous short answers, since we have the opposition between (55a) and (55b):

- (55) Q: [ dare-ga kai-ta ] ronbun-ga itiban yokat-ta no?  
          who-NOM wrote       paper-NOM most       was good Q  
          'The paper that who wrote was best?'

A: a. [ Taroo-ga kai-ta ] ronbun desu.  
Taroo-NOM wrote paper COP  
'The paper that Taroo wrote.'

b. ?\*Taroo desu.  
Taroo COP  
'Taroo.'

The requirement of (55a) as a minimal answer appears to provide us with an interesting argument for the pied piping analysis, but the argument is not so straightforward as we would expect, since, upon closer inspection, it proves that there are some cases in which we are unable to provide an answer by using an elliptical form, as in (56):

(56) Q: Taroo-wa [ Jiroo-ga naze yasun-da to ] it-ta no?  
Taroo-TOP Jiroo-NOM why was absent that said Q  
'Why<sub>i</sub> did Taroo say [ that Jiroo was absent t<sub>i</sub> ]?'

A: \*kaze-o hii-ta kara desu.  
cold-ACC caught because COP  
'Because he caught a cold.'

The impossibility of using an elliptical answer to the naze question in (56) will come as a surprise if a truncated answer is required to recapitulate the material in the matrix COMP in the wh question to give a good answer. Note that this does not mean that we cannot supply an elliptical answer for a naze question in general. As shown below, it is quite legitimate to give a reply in an elliptical form in cases like (57), where naze appears in a matrix clause:

(57) Q: Taroo-wa naze yasun-da no?  
Taroo-TOP why was absent Q  
'Why was Taroo absent?'

A: kaze-o hii-ta kara desu.  
cold-ACC caught because COP  
'Because he caught a cold.'

One important generalization to be drawn here is that if naze is embedded in a subordinate clause (of a bridge verb), it is not possible to give a legitimate truncated answer, as illustrated by the discrepancy in the acceptability of short answers between (56) and (57). If the requirement for a minimal answer were simply characterized in terms of the constituent which moves into COMP at LF in the question, it would be expected that the short answer in (56) should be acceptable, for the logical syntax of the wh question in (56) would be one which has naze in the topmost COMP, as represented in (58):

(58) [<sub>CP</sub> naze<sub>i</sub> [<sub>IP</sub> Taroo-wa [<sub>CP</sub> t<sub>i</sub> [<sub>IP</sub> Jiroo-ga t<sub>i</sub> yasun-da ]  
to ] it-ta ] no ]

The question to be addressed here is what explains the difference in acceptability between (56) and (57) in regard to the possibility of short answers, and what precisely is the grammatical process underlying the judgments in (56) and (57).

As a solution to dissolve this incongruity, we would

like to suggest that the grammatical operation of (pseudo)-clefting is involved in the formation of short answers and that this specific mechanism renders the question-answer pair in (56) impossible. Intuitively, this proposal amounts to claiming that an elliptical answer to a wh question is formulated via cleft formation, and in providing an answer, only the constituency expressing "focus" is presented, with the part indicating "presupposition" omitted. This hypothesis appears to be plausible in view of the fact that a truncated answer in Japanese is usually followed by the copular expression desu or da, just as with a cleft sentence:

- (59) [ Taroo-ni at-ta no ]-wa Jiroo desu.  
 Taroo-DAT met that -TOP Jiroo COP  
 'It was Jiroo that Taroo met.'

On this hypothesis, a cleft sentence and a short answer are claimed to involve the same grammatical operation, and if this is correct, it is anticipated that there will be a significant correlation between them and that an elliptical answer should be well-formed just in case we can find a legitimate counterpart in a cleft sentence.

It is easy to confirm the convergence between these two types of constructions. Indication of the correctness of our claim can be given by the fact that naze 'why' cannot receive the mostly embedded construal in a cleft sentence like (60), where the most embedded clause is the complement of the



bridge verb it-ta 'said':

- (60) [ Taroo-ga [ Jiroo-ga yasun-da to ] it-ta no ]-wa  
Taroo-NOM Jiroo-NOM was absent that said that -TOP  
[ kaze-o hii-ta kara ] desu.  
cold-ACC caught because COP  
'It was because he caught a cold that Taroo said  
that Jiroo was absent.'

Example (60) is unambiguous; the clefted 'reason' adverbial can only be associated with the clause with it-ta, (and the reading on which it is associated with yasun-da 'was absent' is unavailable); the sentence cannot mean "this is the reason such that Taroo said that Jiroo was absent for this reason", and it can only mean "this is the reason that motivates Taroo's saying", which is a somewhat unnatural reading here.

The non-extractability of a reason-adverbial from a lower clause of a bridge verb like it-ta appears to be a marked behavior restricted to a cleft construction, as is manifested by the contrast in acceptability between the following sentences:

- (61) a. John-wa [ Mary-ga naze kuru to ] it-ta no?  
John-TOP Mary-NOM why come that said Q  
'Why did John say that Mary would come?'
- b. \*[ John-ga [ Mary-ga t<sub>i</sub> kuru to ] it-ta no ]-wa  
John-NOM Mary-NOM come that said that -TOP  
naze<sub>i</sub> desu ka?  
why COP Q  
'Why was it that John said that Mary would come?'

Since LF exportation of naze from the lower clause of the bridge verb it-ta is usually licit, as indicated by (61a), it is compulsory to state that the embedded clause does not constitute an island for the purpose of movement. (As such, Subjacency requirement does not account for the unambiguous nature of a sentence like (60) and the ill-formedness of (61b).<sup>22</sup>) Aside from the problem of the limited application of cleft exportation in the case of naze, it must be noticed that the impossibility of the embedded construal in (60) is quite on a par with that of (61b), so that it is quite plausible to analyze these cases as involving the same cleft formation.

The generalization that this peculiar restriction on cleft formation is limited to extraction of a 'reason' adverbial clause or a 'reason' adverbial wh phrase like naze gains further plausibility from the fact that other types of clauses or wh phrases do not give rise to the same pattern of distribution. Consider the following sentences:

(62) a. [ Taroo-ga [ jiroo-ga t<sub>1</sub> kuru to ] it-ta no ]-wa  
 Taroo-NOM Jiroo-NOM come that said that -TOP

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 22. The fact that the adverbial wh phrase naze cannot take embedded scope in a sentence like (61b) raises an interesting theoretical problem, but I do not have any insightful solution at present. In view of the fact that the lower clause of a bridge verb does not form a syntactic island, we would have to conclude that some unknown factors come into play in extraction of naze in a cleft construction and that the phenomena should be handled separately from the core cases of Wh movement.

itu<sub>1</sub> desu ka?  
 when COP Q  
 'When was it that Taroo said that Jiroo would  
 come?'

- b. [ Taroo-ga [ Jiroo-ga t<sub>1</sub> ture-te kuru to ] it-ta  
 Taroo-NOM Jiroo-NOM bring come that said  
 no ]-wa dare<sub>1</sub> desu ka?  
 that -TOP who COP Q  
 'Who was it that Taroo said that Jiroo would  
 bring?'

The statement that 'long distance' movement is allowed from a lower clause of a bridge verb like it-ta holds true in cases where cleft sentences involve itu 'when' or dare 'who', but not naze. In fact, as illustrated by the examples found in (62), wh phrases such as itu, dare, etc. can be understood as being extracted from the mostly embedded clause in the cleft construction.

As predicted from our analysis, short answer formation conforms nicely to this pattern, and a truncated answer, which specifies the value of a wh phrase, is possible with the following questions:

- (63) Q: Taroo-wa [ Jiroo-ga itu kuru to ] it-ta no?  
 Taroo-TOP Jiroo-NOM when come that said Q  
 'When did Taroo say that Jiroo would come?'

A: san-zi-(ni) desu.  
 three-time-(at) COP  
 'At three o'clock.'

- (64) Q: Taroo-wa [ Jiroo-ga dare-o ture-te kuru to ]  
 Taroo-TOP Jiroo-NOP who-ACC bring come that  
 it-ta no?  
 said Q  
 'Who was it that Taroo said that Jiroo would bring?'

A: Hanako desu.  
Hanako COP  
'Hanako.'

This pattern of distribution is expected if short answer formation is defined as deriving from a cleft construction. The fact cannot be correctly characterized if it is assumed that a short answer merely recapitulates the constituent that is moved by Wh movement in the question. In general, the systematic correspondence between the two types of constructions seem to provide an indication in favor of the view that an elliptical answer is yielded via cleft formation.

In sum, it turns out from the discussion above that a possible short answer to a wh question shares an important property with a cleft sentence, and the fact appears to indicate that both types of constructions involve the same grammatical operation, i.e. (pseudo)-clefting. The impossibility of using an elliptical answer in the case of (56) is, in particular, suggestive and appears to show that the strategy of short answer formation does not offer us a straightforward reflex of the LF structure which obtains in a wh question. This may be taken as another piece of evidence that we cannot depend too much on possible elliptical answers to argue about the existence of LF pied piping, and the data above, in effect, shows that a possible elliptical answer cannot be taken as a reliable diagnostic for determining what moves into COMP in the LF formation of a wh question.

### 3.7. Summary

In this chapter, we have first shown, based on Sinhalese data, that LF Wh movement is constrained by Subjacency, and that the apparent immunity to Subjacency is drawn from the system of LF pied piping. Then, we have proposed a specific mechanism of pied piping and claimed that the operation of pied piping is performed by suffixation of a Q-domain marker to a syntactic island. In this connection, it has been argued that the incompatibility of pied piping with a 'why' expression is due to the absence of forms in which it is combined with an overt Q-domain marker, which we assume to hold responsibility for pied piping. The proposed analysis strongly suggests that LF Wh movement bears a striking similarity to S-structure movement in regard to Subjacency.

## CHAPTER 4

### SUBJACENCY AND THE CONCESSIVE CONSTRUCTIONS IN SINHALESE

#### 4.1. Introduction

In the preceding chapter, a specific suggestion to the effect that the distribution of a Q-domain marker restricts the possibility of pied piping has been advanced. The analysis which we have been advocating suggests that the identification of the types of wh phrases should be immediately relevant for pied piping and that the pied-pipability of islands is diagnosed by whether or not the quantificational domain of wh phrases is syntactically identified.

We also have seen in the previous chapter that our proposed analysis can resolve a number of serious problems that arise in the previous treatments of pied piping. Under our treatment, pied piping is essentially regarded as a case of reanalysis, where an island is analyzed as a relevant wh expression to get raised in place of a wh phrase. This analysis strongly suggests that LF Wh movement should be subject to the Subjacency constraint in a way analogous to S-structure Wh movement.

In the present chapter (also in the next chapter), fur-

ther pursuing the pied piping analysis, we will examine the scope behavior of wh phrases embedded in concessive clauses. As we will see shortly, the scope properties of wh phrases in concessive clauses, at first blush, might look like presenting an exception to our analysis of LF pied piping, but closer examination reveals that this is not the case. For the purposes of demonstrating this, we will examine the nature of concessive clauses and the general properties of wh phrases located inside concessive clauses, making crucial use of Sinhalese.

#### 4.2. Two Types of Concessive Clauses

Before entering into the examination of concessive clauses in Sinhalese, let us begin our discussion by noting that the peculiarity of Sinhalese concessives consists in the fact that the quantificational force of a concessive clause may be either universal or existential, depending on the kind of the Q element which heads the concessive clause. To appreciate the relevance of the examples to follow, observe first that in Sinhalese, there are three types of Q particles which may combine with wh words, as is illustrated below:

- (1) a. Kau-də aawe?  
      who-Q came  
      'Who came?'
- b. Kauru-t aawa.  
      who-Q came

'Everyone came.'

c. Kauru-hari aawa.  
who-Q came  
'Someone came.'

In (1a) the wh word kauru 'who' comes with the interrogative particle -də, the sentence, as a whole, carrying an interrogative force. In (1b) and (1c), the wh word kauru occurs in combination with the Q particles -t and -hari, conveying a universal quantificational force and an existential quantificational force, respectively.<sup>1</sup> What is particularly notable about Sinhalese quantified sentences is the fact that the existential force of a quantified phrase is expressed by means of the particle -hari, which is distinct from a particle expressing an interrogative force.<sup>2</sup>

In Sinhalese both the universal Q element -t and the existential Q element -hari can stand as scope indicators, and more importantly, both of the Q particles are compatible with the concessive construction, as exemplified by (2):

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1. The Q particle t in Sinhalese may cause us confusion with a trace t. To avoid possible confusions, we will hyphenate Q elements in Sinhalese.

2. Karttunen (1977) suggests that a wh question gives rise to an existential implicature. Both existential and interrogative sentences share the implication that the set of propositions denoted by the proposition is non-empty (i.e. an existential implicature). In Japanese, both kinds of sentences can be expressed by the use of the existential Q element ka. But Sinhalese implements distinct Q morphemes for expressing existential and interrogative forces.



- (2) a. [ Chitra kauru ekkərəgenə aawa-t ] Ranjit  
 Chitra who bring come-Q Ranjit  
 satutu unaa.  
 pleased became  
 'No matter who Chitra brought, Ranjit was happy.'
- b. [ Chitra kauru ekkərəgenə aawa-hari ] Ranjit  
 Chitra who bring come-Q Ranjit  
 satutu unaa.  
 pleased became  
 'For some x, x is a person, if Chitra brought x,  
 Ranjit was happy.'

The sole difference distinguishing between (2a) and (2b) is that while the entire concessive clause in (2a) is headed by a universal Q particle, the concessive clause in (2b) is accompanied by an existential Q element. This leads us to expect that these two types of clauses possess similar syntactic properties, since the only difference between them is the choice of the Q element. It will be shown below that these two types of concessive clauses in fact pattern alike.

Since a wh phrase, which is an indeterminate pronoun by itself, acquires a universal quantificational force in the context of the universal concessive construction, and an existential quantificational force in the context of the existential concessive clause, we claim that a wh word in a concessive clause undergoes an LF operation that interprets the wh phrase by first placing it in a position by virtue of which it can be coindexed with a Q element which heads the concessive clause, as in (3):

(3) a. [<sub>CP</sub> WH<sub>i</sub> [<sub>IP</sub> ..... t<sub>i</sub> ..... ] -t<sub>i</sub> ] ...

b. [<sub>CP</sub> WH<sub>i</sub> [<sub>IP</sub> ..... t<sub>i</sub> ..... ] -hari<sub>i</sub> ] ...

If it is assumed that a wh phrase in a concessive clause is vulnerable to a grammatical operation of Wh fronting at LF, which moves it to a position different from the one that it actually occupies, it is naturally anticipated that the wh phrase takes on a different quantificational force depending on whether the concessive clause is headed by a universal Q particle or an existential Q particle.

In (3a), for instance, a wh word is fronted to the specifier position of the concessive clause, and it is governed by the Q element -t at the LF level. In this grammatical environment, the universal quantificational force of the Q element can be assigned to the wh phrase, and thereby the wh phrase can take the meaning of the universal quantifier. In exactly the same vein, if the concessive clause is headed by the existential Q particle -hari, as in (3b), it is expected that a wh phrase acquires an existential quantificational force, since the Q element -hari comes to govern the wh phrase at LF. In (3b), by way of the coindexation between the wh phrase and the Q element -hari at LF, the wh phrase in effect can have the meaning of an existential quantifier, in construction with the existential Q element.

Since we are claiming that Wh movement is involved in

the LF formation of a concessive clause, it is naturally expected that Subjacency is a principle that constrains the well-formedness of concessive clauses. The major aim of the ensuing discussion is to show that Subjacency is indeed a principle that constrains the LF formation of concessive clauses (contrary to appearances). As a step in the search of support for our claim, let us first focus on the universal concessive clause in Sinhalese. Toward the end of this chapter, we will further show that the two types of concessive clauses, i.e. universal and existential concessive clauses, share basic properties with each other, and that the validity of our claim is also confirmed by the existential concessive construction.

#### 4.2.1. Universal Concessive Clauses

Now, restricting our attention to the cases of the universal concessive construction, let us consider what properties the universal concessive clause possesses in Sinhalese. One of the notable properties of the concessive construction in Sinhalese consists in the fact that a concessive clause is formed by attaching a bound Q element to its clause final position. As an entry to the discussion, let us first consider the following sentence:

(4) [ Chitra kauru ekkærəgenə aawa-t ] Ranjit satuṭu wenəwa.

Chitra who bring come-Q Ranjit happy become  
'No matter who Chitra brings, Ranjit is happy.'

The concessive clause in Sinhalese stands in marked contrast with a Sinhalese wh question in the sense that the concessive clause requires a Q element to be placed in clause final position. Thus the following sentence is ill-formed, because the Q element appears in argument position:

(5) \*[ Chitra kauru-t ekkəɾəgenə aawa ] Ranjit satutu wenəwa.  
Chitra who-Q bring come Ranjit happy become  
'No matter who Chitra brings, Ranjit is happy.'

As exemplified above, in the case of concessive clauses in Sinhalese, the Q element which indicates the quantificational force of a concessive clause must be located in clause final position.

One interesting fact to be noted here is that although the wh phrase kauru 'who' in (4) does not occur in such a way that it is adjacent to the Q element, the wh phrase acquires a universal quantificational force, and acts like a universally quantified expression. Since it is usually required that the wh phrase stand in a government relation with a Q element to get a quantificational force, this fact implies that the wh phrase undergoes Wh movement and is coindexed with the Q element at LF. The adequacy of this claim can be checked in several ways, but to achieve this goal, we will

first consider the scope properties of a wh phrase appearing in a concessive clause. On the basis of the scope of such a wh phrase, it can be shown that a wh phrase, if embedded in a concessive clause, moves into the specifier position of COMP and is coindexed with the Q element.

Prior to giving a detailed analysis of the Sinhalese concessive construction, we first need to consider what properties multiply quantified sentences possess in Sinhalese. For concreteness, let us consider the following quantified sentence:

- (6) kauru-t kaa-tə-hari aadərəyə kərənəwa.  
 who-Q who-DAT-Q love do  
 'Everyone loves someone.'

Note that the sentence in (6) allows ambiguous interpretation with regard to the scope of the two quantifiers, kauru-t 'everyone' and kaa-tə-hari '(to) someone'; namely, for all x, there is y, such that x loves y, and there is y, for all x, such that x loves y. As discussed previously, in the present type of multiple quantified construction, the kind of ambiguity that is observed above is typically found in a construction in which quantifiers come to hold a  $\Sigma$  sequence at the level of LF.

This, in turn, entails that if one quantifier is separated from the other quantifier in such a way that they

are unable to constitute a  $\Sigma$  sequence at LF, we will not observe interaction with regard to the scope of the quantifiers. This prediction is indeed correct:

- (7) a. [ Kauru-t Chitra-tə aadərəyə kərənəwa kiyəla ]  
           who-Q Chitra-DAT love do that  
           kauru-hari balaaporottu wenəwa.  
           who-Q hope become  
           'Someone expects that everyone loves Chitra.'
- b. [ Kauru-t enəwa nam ] kauru-hari satuten innawa.  
           who-Q come if who-Q pleased be  
           'Someone is happy if everyone comes'

In both cases in (7), the existential quantifier kauru-hari 'someone' in the main clause is always taken as enjoying scope over the other universal quantifier kauru-t 'everyone' embedded in the lower clause. The reading for kauru-t is interpretively independent of the information provided by the existentially quantified phrase kauru-hari, and these quantified phrases, evidently, do not participate in scope interaction, with the former only having a group interpretation. This shows that quantifiers are prohibited from interacting scopally with each other if they do not reside in the same clausal neighborhood.

This descriptive generalization, however, does not hold for the concessive construction, because the boundedness requirement of quantification, apparently, does not apply to a concessive clause like (8):

- (8) [ monəwa una-t ] kauru-hari kataa kiiwa.  
 what happen-Q who-Q complaint said  
 'No matter what happened, someone complained.'  
 (a) 'For all x, x is a thing, for some y, y is a  
 person, if x happened, then y complained.'  
 (b) 'For some y, y is a person, for all x, x is a  
 thing, if x happened, y complained.'

Despite the fact that monəwa 'what' is deeply embedded in the concessive clause, the sentence in (8) displays the scope property which is quite comparable to that of (6): As the attempted paraphrases indicate, either the wh phrase monəwa 'what' or the existential quantifier kauru-hari 'someone' is understood as taking wide scope over the other in (8).

In order to account for such an irregularity pertinent to the concessive clause in question, we might conjecture that since Wh movement is involved in the formation of a concessive clause, monəwa can be exported out of the concessive clause at the LF level, (without regard to the Subjacency constraint), so that it can come to form a  $\Sigma$  sequence with kauru-hari in the main clause, as represented in (9):

- (9) [<sub>CP</sub> monəwa<sub>i</sub> [<sub>IP</sub> [<sub>CP</sub> [<sub>IP</sub> t<sub>i</sub> una ] -t ] [<sub>IP</sub> kauru-hari<sub>j</sub>  
 [<sub>IP</sub> t<sub>j</sub> kataa kiiwa ]]]]

Given an LF representation like (9), the two quantified expressions are expected to interact scopally with each other, but there is good reason to believe that the mechanism of the

'long distance' Wh raising cannot be utilized to represent the ambiguity of a sentence like (8).

There are at least two kinds of conceptual problems attending this type of analysis; first, in (9), there is no appropriate stopping site in the main clause for a wh phrase to land on, because the topmost COMP is not headed by the Q element -t (nor by any other Q elements);<sup>3</sup> second, since Subjacency is a viable constraint on LF Wh fronting in Sinhalese, a wh phrase like monəwa simply cannot be extracted from an adjunct clause like a concessive clause. (If monəwa were moved to the topmost COMP, then, it would have to be moved far beyond the minimal clause that contains it, violating Subjacency.) The non-extractability of a wh phrase from an adjunct clause can be clearly envisioned in the case of Sinhalese, as is shown by the contrast below:

- (10) a. [ kauru aawa witə ]-də Chitra gedərə no hitiye.  
           who came time -Q Chitra home not was  
           'When who came, Chitra was not home?'
- b. \*[ kau-də aawa witə ] Chitra gedərə no hitiye.  
           who-Q came time Chitra home not was  
           'When who came, Chitra was not home?'

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 3. Note that a landing site for a wh phrase must be marked [+WH], typically, by a Q element. Note also that in Sinhalese, the wh phrase is required to get bound by the closest Q element -t in the concessive clause, so that the wh phrase is in no way construed as acquiring matrix scope. (cf. Lasnik and Saito (1984))



It is easy to see that the above examples display a discrepancy in acceptability, despite the fact that these two sentences are structurally parallel in every respect except for the position of the Q element. As argued earlier, since the Q element də specifies the constituent to get moved by Wh movement, the fact gives us a good indication that while the movement of the entire adjunct clause is permissible, extraction of a wh phrase from a position within the adjunct clause is not permitted.<sup>4</sup>

Furthermore, if it is correct to assume that the long distance Wh movement is responsible for the ambiguity of the quantified sentence in (8), then it is expected that the following sentence is also ambiguous with regard to the two quantified phrases:

- (11) kauru-hari [ [ monəwa una-t ] Chitra satutu wenəwa ]  
 who-Q                    what    happen-Q Chitra happy    become  
 kiiwa.  
 said  
 'Someone said that no matter what happened, Chitra was  
 happy.'

Interestingly, contrary to the expectation, the sentence in (11) is unambiguous, and it has the only interpretation in which kauru-hari 'someone' in the main clause takes broad

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4. Here, it is essential to assume that the same kind of Wh movement is utilized both in wh questions and in concessive clauses.

scope over monəwa 'what' in the concessive clause. This fact shows that the scope domain of the wh phrase monəwa does not extend over the main clause and that it is limited to the embedded clause of kiiwa, since the sentence fails to display scope interaction with regard to the two quantified expressions.

The non-ambiguity of the sentence in (11) is indicative of the fact that the scope of a wh phrase in a concessive clause is not totally unbounded. If a wh phrase were extractable from the concessive clause, as in (9), there would be no reason that the wh phrase is moved to a position where it can form a  $\Sigma$  sequence with the matrix quantifier kauru-hari, as in (12), especially, in view of the fact that the embedded clause of kiiwa does not constitute an island for the purpose of movement:

(12) [<sub>CP</sub> monəwa<sub>1</sub> [<sub>IP</sub> kauru-hari<sub>3</sub> [<sub>IP</sub> t<sub>3</sub> [<sub>CP</sub> [<sub>IP</sub> [<sub>CP</sub> [<sub>IP</sub> t<sub>1</sub>  
una ] -t ] Chitra satutu wenəwa ] ] kiiwa ] ]]

The fact that (11) is unambiguous presents a serious problem for the analysis if the LF movement of the wh phrase is taken to be a determinant of the ambiguity of (8). Since the scope domain of the wh phrase in the concessive clause does not freely extend over the main clause in the case of (11), it is reasonable to conclude that the ambiguity of the sentence in (8) does not result from the wh phrase being extracted from

the concessive clause.

At this point, it is worthwhile to see that a wh-site has nothing to do with the determination of the scope behavior of the wh phrase at issue. Instead, inspection of the data shows that the determining factor of the scope of the wh phrase lies in the position of a Q element, which we claim to combine with the wh phrase at the level of LF. In the case of (8), for example, the concessive clause (and hence the Q element which heads the clause) resides in the same clausal neighborhood with the quantifier kauru-hari, and we observe scope interaction between the wh phrase and the quantifier. In comparison to this, the Q element which heads the concessive clause is not situated in the same clause as the quantifier kauru-hari in the case of (11), and in this case, no scope ambiguity is found. It is clear from this fact that the relevant factor for the determination of the scope of the wh phrase is traced to the position of the Q element.

The apparent irregularity of the phenomena of scope interpretations with regard to the wh word monəwa is, in fact, readily resolved if we assume that the wh expression is moved into the COMP in the concessive clause by means of Wh fronting and that it is coindexed with the Q element -t at the level of LF, as illustrated in (13):

- (13) [<sub>CP</sub> [<sub>CP</sub> monəwa<sub>i</sub> [<sub>IP</sub> t<sub>i</sub> una ] -t<sub>i</sub> ]<sub>i</sub> kauru-hari kataa  
kiiwa ]

In this type of LF representation, monəwa is assumed to move into the SPEC of CP in the concessive clause and the scope index of monəwa is transmitted to the Q element. Since the scope index of monəwa is carried over to the Q element in this analysis, it is natural to assume that the entire concessive clause, which is headed by the Q element, comes to have the scope index of the wh phrase.

As the concessive clause lies in the same clausal neighborhood with the matrix quantifier in the case of (8), the concessive clause carrying the scope index of the wh phrase can come to form a  $\Sigma$  sequence with the quantifier kauru-hari if the entire clause is assumed to undergo QR at LF. If so, it is naturally expected that the wh phrase is allowed to extend its scope beyond the concessive clause, interacting scopally with the matrix quantifier. On the other hand, if the concessive clause is embedded in a complement clause, as in (11), we do not expect the wh phrase to interact with a matrix quantifier, since the matrix quantifier is too far away from the concessive clause to participate in scope interaction.

Given this analysis, it is now easy to see that what triggers the kind of scope interaction observed in (8) is the universal Q element -t, rather than the wh word monəwa embedded in the concessive clause. In our analysis, the fact that monəwa can extend its scope beyond the concessive

clause, interacting scopally with kauru-hari in the main clause, is attributed to the coindexing relation which monəwa bears with the universal Q element -t, and ultimately, with the concessive clause, at the level of LF. This analysis is, in fact, plausible enough in view of fact that the wh phrase, rather than the whole concessive clause, is construed as involving quantification in the concessive construction. This observation, together with the scope fact, strongly motivates the existence of LF Wh raising within the concessive clause.

At this point, it is important to keep in mind that the current analysis assumes that while a sentence like (8) involves movement of a wh phrase inside the concessive clause, a sentence like (14), which contains a pied piped constituent in it, has nothing to do with movement of a wh word within the constituent:

- (14) [ kauru liyəpu ] pot-ak-una-t wikinenəwa.  
       who wrote book-INDEF-Q is sold  
       'For every x,y, x is a person, y is a book x wrote,  
       y is sold.'

In (14), the entire complex NP is pied piped via the adjunction of the Q element -t. In this case, since the Q element is merely a Q-domain marker, the entire NP is understood as a quantified expression whose identification is made through the assignment of values to the wh phrase inside it. In this case, since the entire NP is quantifying, licensed by the Q

element, there is no way of an internal Wh movement taking place, given the assumption that the Q element can only assign its quantificational force to a constituent under government and that movement is limited to such an element.<sup>5</sup>

Some irrelevant details aside, this analysis fits nicely into the treatment of the scope interaction found in the following sentence:

- (15) kauru-hari [ kauru liyəpu ] nibandane-t kieuwa.  
 who-Q            who    wrote    paper-Q        read  
 (a) 'There is some x, x is a person, for every y,z, y is a person, z is a paper y wrote, x read z.'  
 (b) 'For every y,z, y is a person, z is a paper y wrote, there is some x, x is a person, x read z.'

The sentence in (15) is ambiguous in terms of scope and admits two interpretations, either the NP kauru-hari or the complex NP [ kauru liyəpu ] nibandane-t standing within the scope of the other. The full range of the scope properties of the sentence in (15) in regard to the complex NP [ kauru liyəpu ] nibandane-t can be most readily captured if the entire NP is viewed as a quantified expression which is susceptible to QR at LF.

Alternatively, it might be possible to postulate that the Q element assigns its quantificational force to the wh

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 5. In the present analysis, this mechanism ensures that the Spec-head agreement is limited to one-to-one, with the additional proviso that X<sup>o</sup> head offers only a single landing site.

word in one way or another, but this does not seem to be a plausible way. In a given case, since the scope of kauru 'who' appears to undergo a concomitant change with the scope of the entire complex NP, a more feasible view is that the whole entire complex NP, but not the wh word, is assigned a universal quantificational force. Under the current view, the entire NP can, in fact, naturally be conceived of as a wh expression whose value is determined by way of the value of the wh word within it.

Note in passing that there is a discrepancy in the scope interpretation between (15) and (16) as well; while (15) is ambiguous between kauru-hari 'someone' and [ kauru liyəpu ] potə-t 'every book that everyone wrote' in terms of scope, either one taking scope over the other, example (16), which is given below, is unambiguous in that the matrix quantifier kauru-hari always takes scope over the embedded quantified expression kauru-t 'everyone':

- (16) kauru-hari [ kauru-t liyəpu ] nibandane kieuwa  
 who-Q            who-Q    wrote    paper        read  
 'Someone read the paper that everyone wrote.'

In the cases at hand, the wh phrase occupies exactly the same position, but the possibility of scope interpretations differs. Note here that the only structural difference between these sentences is that while the Q particle -t resides in the matrix clause in (15), the Q element -t in (16) is em-

bedded within the relative clause. As the reader can easily verify, this pattern of scope interpretation is quite comparable to what we see in the contrasting pair of (8) and (11), and this confirms the adequacy of our claim that the positioning of a Q element is crucial for the determination of the scope of a quantified expression.

In any event, the main strength of the present analysis lies in the fact that it permits a nice account of the discrepancy between (8) and (15) with regard to their possible scope dependencies. In the case of (8), the wh phrase monəwa is considered as being inside or outside of the scope of the quantified expression kauru-hari. In our analysis, this scope interaction comes from the fact that monəwa inside the concessive clause undergoes Wh raising, and is coindexed with -t at the LF level, obtaining the universal quantification. The readings associated with (15), on the other hand, are different, and the entire NP [kauru liyəpu] nibandane-t is understood as interacting with kauru-hari in terms of scope. In this case, our analysis claims that no Wh raising is involved and that the entire NP acquires a universal import from -t. As illustrated above, by our account, these two types of quantified expressions are clearly distinguished, according to whether they contain a wh word which undergoes Wh movement inside or not.

With the analysis which attributes the wide scope option of a wh phrase in a concessive clause to the presence of a Q



particle which heads the concessive clause, it can be readily recognized that the scope of a wh phrase in a concessive clause, in effect, comports nicely with the well-known pattern of scope phenomena involving quantified phrases. Among other things, notice that in our analysis, since the entire derivation of the LF structure in (13), which is posited for (8), does not violate any conceivable principle of the grammar, it is naturally anticipated that the sentence is ruled grammatical, even if it looks as though the wh phrase extends scope over the main clause, running afoul of the boundedness requirement.

Be that as it may, it seems clear from the discussion above that the scope interaction found in a concessive clause like (8) can, to a great extent, serve as the basis for determining what constituent is moved via Wh movement. On the view being advanced here, when the specifier position of the concessive clause is occupied by a wh expression, we may understand the clause as involving quantification over the wh phrase. The reason why a wh phrase in a concessive clause can commute in scope with a quantifier outside is that the scope index of the wh phrase is encoded into the Q element which heads the concessive clause. In our analysis, just as quantifiers in their vicinity participate in scope interaction, so a wh phrase in SPEC of CP in a concessive clause is allowed to participate in scope interaction with a quantifier located outside it, by virtue of the presence of the Q

element that it coindexes with.

Since we are claiming that Wh movement is involved in the formation of a concessive clause, we would expect that Subjacency should be a principle that constrains the well-formedness of a concessive clause. At first blush, it might look as if the well-formedness of a sentence like (17) poses a problem, since the sentence is acceptable even though a wh phrase is on an island:

- (17) [ [ kauru gattə ] pot-ak kieuwa-t ] Ranjit  
          who buy book-INDEF read-Q Ranjit  
          satutu unaa.  
          pleased became  
          'For whatever x,y, x is a person, y is a book x bought,  
          Ranjit was pleased if he read y.'

In spite of the fact that the wh phrase kauru 'who' is deeply embedded in a syntactic island, i.e. in a relative clause, example (17) is fully acceptable. If kauru were exported from the position inside the island to the specifier position outside the island by the requirement of LF Wh raising, the sentence should be excluded due to a Subjacency violation. But the sentence does not display any effect of Subjacency. What we suggest here is, in line with the previous arguments, that pied piping is at work in a sentence like (17) in Sinhalese, so that the raising of the entire island is necessitated in the LF component, yielding an LF representation like (18a), rather than one in (18b):

(18) a. [CP [ kauru gattə ] pot-ak<sub>1</sub> [IP t<sub>1</sub> kieuwa ] -t<sub>1</sub> ]

b. [CP kauru<sub>1</sub> [IP [ t<sub>1</sub> gattə ] pot-ak kieuwa ] -t<sub>1</sub> ]

An interesting consequence of this proposal is that given an LF structure like (18a), not (18b), Subjacency is, obviously, not violated. Since the movement of the entire island does not involve the crossing of any barrier, the sentence should be well-formed in no violation of Subjacency. As we will see below, this is, in fact, a correct analysis for a sentence like (17), in which a wh phrase is located inside a syntactic island.

If we take a closer look at the concessive construction, we can find evidence to convince us that LF pied piping can occur within a concessive clause. For concreteness, let us consider a little complex example, in which a quantifier appears in the matrix clause:

(19) [ [ kauru liyəpu ] liumə kieuwa-t ] kauru-hari  
       who wrote letter read-Q who-Q

kataa kiiwa.

complaint said

(a) 'For whatever x,y, x is a person, y is a letter x wrote, there is some z, z is a person, z complained if I read y.'

(b) 'There is some z, z is a person, for whatever x,y, x is a person, y is a letter x wrote, z complained if I read y.'

Sentence (19) is ambiguous; either the complex NP [kauru liyəpu] liumə or the existential quantifier kauru-hari can be regarded as having wide scope. The sentence above, then, has interpretations parallel to those in (20), the only difference being that the former involves a complex NP, while the latter a simple NP:

- (20) [ monəwa kieuwa-t ] kauru-hari kataa kiiwa.  
       what read-Q who-Q complain said  
       'No matter what I read, someone complained.'  
       (a) 'For whatever x, x is a thing, there is some y,  
           y is a person, y complained if I read x.'  
       (b) 'There is some y, y is a person, for whatever x,  
           x is a thing, y complained if I read x.'

The interpretations associated with (20) are, as discussed above, derived from the LF structure in which monəwa is moved into the C-specifier position of the concessive clause, as is represented in (21):

- (21) [ [CP monəwa<sub>i</sub> [IP t<sub>i</sub> kieuwa ] -t<sub>i</sub> ]<sub>i</sub> ..... ]

Inasmuch as we sustain the view that the scope dependency of a wh phrase within a concessive clause is determined by the presence of a Q element by which the concessive clause is headed, we see that the scope interaction which is found in (19) is best analyzed by treating the entire complex NP as undergoing Wh movement at LF, since the entire relative clause is construed as interacting scopally with the matrix

quantifier.

Accepting the view that a scope mechanism of the sort that Wh movement embodies is responsible for the scope interpretation of the wh word in (20), it must be postulated that the concessive clause in (19), where a wh phrase is contained within a relative clause, has an LF construal in which the entire island is fronted by means of LF Wh raising, as shown by (22):

(22) [ [CP [ kauru liyəpu ] liumə<sub>1</sub> [IP t<sub>1</sub> kieuwa ]  
-t<sub>1</sub> ]<sub>1</sub> ..... ]

In the LF representation in (22), the entire NP is moved as a consequence of LF pied piping, and its scope index is carried over to the Q element in the concessive clause, thereby the complex NP having full sentential scope.

Under this view, the fact that the complex NP [kauru liyəpu] liumə extends its scope over the main clause, just like monəwa in (20), is ascribed to the coindexation between the complex NP and the Q element. If the analysis is correct, this shows that the entire complex NP comes to occupy the COMP position, essentially, by virtue of the LF rule of pied piping. Insofar as we maintain the analysis dealing with the interpretive properties of the complex NP by means of LF pied piping, the analysis can correctly encode the observation that the scope behavior of the entire complex NP is

generally on a par with that of the simple wh word kauru in (20).

Consideration of a sentence like (20) brings us to another point. Since we are stating that a wh phrase is proscribed from moving out of a syntactic island, due to the requirement of Subjacency, it is expected that if a wh phrase is embedded in the complement clause of a bridge verb, which does not constitute an island, nothing blocks the movement of the wh phrase, and the wh phrase alone is allowed to interact in scope with a quantifier in the matrix clause. This prediction is indeed correct, as in (23):

- (23) [ Chitra [ kauru ekkārəgenə enəwa kiyəla ] kiiwa-t ]  
 Chitra who bring come that say-Q  
 kauru-hari kataa kiiwa.  
 who-Q complain said  
 'No matter who Chitra said she would bring, someone complained.'  
 (a) 'For whatever x, x is a person, there is some y, y is a person, if Chitra said she would bring x, y complained.'  
 (b) 'There is some y, y is a person, for whatever x, x is a person, if Chitra said she would bring x, y complained.'

As indicated above, the wh expression located inside the complement clause of the bridge predicate kiiwa can be interpreted with either the existential or the universal quantifier having wide scope. The kind of scope interaction exhibited in the sentence in (23) clearly shows that the wh phrase kauru alone is susceptible to LF Wh movement, and is

extracted from the embedded clause at the LF level, yielding the following LF structure:

(24) [ [CP kauru<sub>1</sub> [IP Chitra [CP t<sub>1</sub> [IP t<sub>1</sub> ekkərəgenə enəwa ] kiyəla ] kiiwa ] -t<sub>1</sub> ]<sub>1</sub> ..... ]

The LF structure must be the correct LF construal for the sentence in (23), because the concessive clause is understood as involving quantification over individuals pertaining to kauru, as the attempted translation in (23) shows. If this is correct, it can be said that the choice of a syntactic operation depends on the syntactic environment in which a wh phrase appears. Furthermore, the distribution of the scope interpretations of the wh phrase clearly shows that a wh phrase embedded in a concessive clause is subject to LF Wh fronting as long as it does not involve extraction from a syntactic island.

In light of these considerations, it seems worthwhile to note that the Sinhalese data provides us with a convincing argument for the claim that we should be divorced from the syntactic mechanism of LF Wh movement as employed in the conventional analysis, which sets Subjacency apart from the general definitions on the rule of LF Wh movement. The standard analysis is highly problematic, because the mechanism of LF Wh raising, which is dissociated from Subjacency, would, for one thing, bring us a serious complica-

tion in explaining the scope dependencies found in (19). Even worse, structures of the sort that would be yielded by movement of a wh phrase alone in cases like (19) are generally ill-formed:

(25) [ [<sub>CP</sub> kauru<sub>1</sub> [<sub>IP</sub> [ t<sub>1</sub> liyəpu ] liumə kieuwa ]  
-t<sub>1</sub> ]<sub>1</sub> ..... ]

If (25) were the right LF structure for (19), the acceptability of the sentence would be very difficult to account for, given the inherently illicit nature of the hypothesized structure. Since Subjacency must be respected by LF Wh movement, as we discussed above, it seems fair to conclude that the commonly adopted analysis of Wh movement, which utilizes movement of a wh phrase without regard for Subjacency, should be rejected.

Inasmuch as we maintain the particular analysis delineated here, we can also provide a ready account for the fact that a wh phrase located within a concessive clause can serve as the antecedent of a bound pronoun outside the clause in which it resides. Consider the following:

(26) [ Chitra kauru<sub>1</sub> ekkərəgenə aawa-t ] mamə e<sub>1</sub> hambə  
Chitra who bring come-Q I Ø meet  
wenne nəʒʒ.  
become not  
'No matter who Chitra brings, I will not meet (him).'



In Sinhalese, a zero pronoun is understood as a bound variable, and the empty pronoun is construed as a bound variable of kauru in a sentence like (26). The well-formedness of (26), thus, clearly exemplifies the possibility of coindexing with a zero pronoun across a sentence boundary. In our view, this possibility can be explicated by positing the following LF structure, where kauru is coindexed with the Q element -t, as is represented in (27):

(27) [ [<sub>CP</sub> kauru<sub>i</sub> [<sub>IP</sub> Chitra t<sub>i</sub> ekkərəgenə aawa ] -t<sub>i</sub> ]<sub>i</sub>  
 [<sub>IP</sub> mamə e<sub>i</sub> hambə wenne nəɛɛ ] ]

Notice here that the Q element -t, which inherits a scope index from kauru, constitutes a category which c-commands the zero pronoun at issue. Since it is assumed, in this analysis, that the concessive clause containing -t defines the scope domain of kauru, the zero pronoun can be legitimately understood as lying within the scope of kauru in a case like (26). The important generalization to be drawn here is that the zero pronoun anaphoric to the wh phrase must be under the scope of the concessive clause carrying its scope index for the pronoun to count as bound by the wh phrase.

The claim that the possibility of variable-binding is relegated to the coindexation of kauru with the Q element -t in a sentence like (26) can be further ascertained by the

grammatical contrast observed below:

- (28) a. [ Chitra [ kauru<sub>1</sub> ekkərəgenə enəwa kiyəla ] kiiwa-t ]  
 Chitra who bring come that say-Q  
 Ranjit nitərəmə e<sub>1</sub> hambə wennə hadənəwa.  
 Ranjit always Ø meet become want  
 'No matter who Chitra says that she will bring,  
 Ranjit always wants to meet (him).'
- b. \*[ Chitra [ kau<sub>1</sub>-də enne kiyəla ] dənəgenə hitiya-t ]  
 Chitra who-Q come that know be-Q  
 Ranjit nitərəmə e<sub>1</sub> hambə wennə hadənəwa.  
 Ranjit always Ø meet become want  
 'Even if Chitra knows who will come, Ranjit always  
 wants to meet (him).'

In (28a), kauru can be coindexed with the Q element -t, because the movement of kauru is permitted from within a complement clause of a bridge verb like kiiwa; hence the zero pronoun can be anaphoric to kauru as a bound variable, falling within the scope of kauru, as represented in (29):

- (29) [ [CP kauru<sub>1</sub> [IP Chitra<sub>3</sub> [CP [IP pro<sub>3</sub> t<sub>1</sub> ekkərəgenə  
 enəwa ] kiyəla ] kiiwa ] -t<sub>1</sub> ]<sub>1</sub> .... e<sub>1</sub> .... ]

In the LF construal in (29), the concessive clause which commands the zero pronoun carries the scope index of the wh phrase which is moved into the C-specifier position of the clause. Given this type of construal, it is quite evident that the zero pronoun can be taken as anaphoric to the wh phrase, serving as a bound variable. On the other hand, the wh phrase kauru in (28b) is only construed with də, which is

the closest Q element which c-commands kauru.<sup>6</sup> In this sentence, kauru is, in effect, only understood as taking the mostly embedded scope as an indirect question, and in no way can the wh phrase be bound by the Q element -t, as illustrated in (30):

(30) [ [CP [IP Chitra [CP kauru-də<sub>1</sub> [IP t<sub>1</sub> enəwa ] kiyəla ]  
 dænəgenə hiṭiya ] -t ] .... e .... ]

In the logical syntax of (30), the wh phrase kauru is moved to the clause boundary of the mostly embedded clause, and the universal Q element cannot bind anything under this configuration. Since the scope of kauru does not fall over the main clause in this case, the zero pronoun cannot be coindexed with kauru, failing to get evaluated as a bound variable. The fact that an intervening Q element dispels the possibility of variable-binding clearly shows that for the purpose of pronoun-binding, the scope of a wh phrase in a concessive clause is determined not by its own c-command domain, but by the c-command domain of the whole concessive clause of which it is a part.<sup>7</sup>

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 6. In Sinhalese, just like Japanese, a quantificational force assigner to a wh phrase is strictly restricted to one which is closest to the wh phrase.

7. Example (28b) is acceptable if kauru refers to a specific person identifiable by the use of context. The crucial point here is, however, that the sentence is not acceptable with the interpretation in which the null pronominal is bound by kauru as a bound variable.

From our perspective, the fact that a wh phrase in a concessive clause like (28a) can be coindexed with a zero pronoun it does not c-command is not surprising at all. What allows the variable-binding is the fact that the concessive clause headed by the Q element which governs the wh phrase at LF c-commands the zero pronoun. Since the availability of a bound variable interpretation for a null pronoun hinges on whether it is c-commanded by the concessive clause which carries the scope index of the wh phrase, it is interesting to see at this point whether the same kind of variable binding obtains if a wh phrase is contained within a syntactic island like a complex NP. Interestingly, when the grammatical environment is altered in such a way, the bound variable interpretation is upset, as shown below:

- (31) a. \* [ [ kauru<sub>1</sub> enəwa kiənə ] katəkataawə æhuwa-t ]  
           who    come   that    rumor           hear-Q  
 Ranjit e<sub>1</sub> hambə wennə hadənəwa.  
 Ranjit ∅ meet become want  
 'For whatever x,y, x is a person, y is a rumor that  
 x will come, Ranjit wants to meet (him) if he hears  
 about y.'
- b. \* [ [ kauru<sub>1</sub> liyəpu ] potə kieuwa-t ] Chitra  
           who    wrote    book read-Q    Chitra  
 nitərəmə e<sub>1</sub> hambə wennə hadənəwa.  
 always ∅ meet become want  
 'For whatever x,y, x is a person, y is a book x  
 wrote, if Chitra read y, she always wants to  
 meet (him).'

In (31), the indicated interpretation of the zero pronoun is

disallowed. The unacceptability of the sentences in (31) with the indicated interpretation shows that a *wh* word is prohibited from binding a null pronominal in the matrix clause if it is located inside a syntactic island such as a complex NP.

In contrast to this, if the entire complex NP is designated as the antecedent of a zero pronoun, we can readily obtain the intended bound-variable interpretation for the zero pronoun, as the well-formedness of the sentences in (32) indicates:

- (32) a. [ [ kauru enəwa kiənə ] katəkataawə<sub>1</sub> əhuwa-t ]  
           who come that rumor hear-Q  
 Ranjit ikamanətə e<sub>1</sub> wiswaasakala.  
 Ranjit easily  $\emptyset$  believe  
 'For whatever x,y, x is a person, y is a rumor that x will come, Ranjit easily believes (it) if he hears about y.'
- b. [ [ kauru liyəpu ] potə<sub>1</sub> kieuwa-t ] Chitra  
           who wrote book read-Q Chitra  
 nitərəmə e<sub>1</sub> kəmati una.  
 always  $\emptyset$  like became  
 'For whatever x,y, x is a person, y is a book x wrote Chitra always liked (it).'

(Note that there is a minimal difference between sentences in (31) and (32) with regard to the choice of the matrix verb.) As these sentences indicate, the zero pronoun is fully acceptable as a bound variable if it is bound by the whole complex NP. This fact immediately suggests that the grammatical operation of LF pied piping is at work here and that Sub-

jacency holds as a constraint in the LF formation of a concessive clause. The acceptability of one and the unacceptability of the other, i.e. the grammatical contrast between (31) and (32), can be straightforwardly explained by assuming that the concessive clause in (31a) is, for instance, converted into LF construal such as that in (33) via fronting of the entire island:

(33) \* [ [CP [ kauru<sub>1</sub> enəwa kiənə ] katəkataawə<sub>j</sub> [IP t<sub>j</sub> æhuwa ] -t<sub>j</sub> ]<sub>j</sub> .... e<sub>1</sub> ..... ]

Under our analysis, since the assignment of a quantificational force by a Q element is limited to a constituent which it governs, the Q particle -t cannot induce coindexing with kauru, as in (33). Consequently, the zero pronoun fails to fall under the scope of kauru, and the sentence is ruled out as ungrammatical.

Along the same line, the fact that the entire complex NP [ kauru enəwa kiənə ] katəkataawə connects with the zero pronoun as in (32a) is also not surprising in our analysis. In the case of (32a), the whole NP can be coindexed with the Q element in LF, since the entire constituent is moved into COMP as a consequence of LF pied piping:

(34) [ [CP [ kauru enəwa kiənə ] katəkataawə<sub>i</sub> [IP t<sub>i</sub> æhuwa ] -t<sub>i</sub> ]<sub>i</sub> .... e<sub>1</sub> ..... ]

In (34), the whole complex NP is coindexed with the Q element upon the application of the movement of the entire island mediated by LF pied piping. Moreover, since the zero pronoun is c-commanded by the entire concessive clause, the zero pronoun can be understood as falling within the scope of the complex NP, as expected. As is shown above, the fact that a bound variable is only usable in reference to the complex NP automatically falls out from our suggested analysis, which crucially utilizes the notion of pied piping, and with our proposal, we can readily explain both the acceptability of (32) and the unacceptability of (31).<sup>8</sup>

It is noteworthy to see here that this fact would remain inexplicable if it were assumed that the wh phrase alone is moved into the C-specifier position of the concessive clause, as in (35):

(35) [ [CP kauru<sub>1</sub> [IP [ t<sub>1</sub> enəwa kiənə ] katəkataawə  
 æhuwa ] -t<sub>1</sub> ]<sub>1</sub> .... e<sub>1</sub> ..... ]

In the hypothetical LF structure of (35), in which the wh phrase is extracted from within the complex NP, it is ex-

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 8. The Sinhalese facts given in (31) and (32) regarding bound variable binding provide us with another piece of evidence that empirically falsifies Nishigauchi's argument of pied piping. For a detailed discussion on this point, the reader is referred to Chapter 5.

pected that (31) is acceptable, while (32) is not. However, the fact clearly runs counter to the prediction the theory makes. On the basis of this fact, it is fair to conclude that the wh phrase inside the complex NP is not extracted from the island, and that the LF structure in (35) is in no way derived.

Furthermore, let us note that this type of discrepancy pertaining to the bound interpretation is only found in a sentence which comprises a wh phrase within an island. Thus, as long as we obtain a coindexing relation between a Q element and a wh phrase (i.e. if the wh word is not embedded in an island), a zero pronoun which lies within the c-command domain of the concessive clause can be anaphorically linked to the wh phrase, as is evidenced by (36):

- (36) a. [ kauru<sub>1</sub> aawa-t ] mamə e<sub>1</sub> hambə wenne nəɛ.  
           who    come-Q    I        ∅   meet   become not  
           'No matter who comes, I will not meet (him).'
- b. [ Chitra [ kauru<sub>1</sub> enəwa ] kiiwa-t ] mamə e<sub>1</sub> hambə  
           Chitra   who        come        say-Q        I        ∅   meet  
           wenne nəɛ.  
           become not  
           'No matter who Chitra says will come, I will not  
           meet (him).'

The sentences are fully acceptable with the indicated interpretation for the zero pronoun. The array of data presented here clearly indicates that LF pied piping is operative in the formation of a concessive clause only when a wh phrase is



inserted into a syntactic island.

Prior to concluding this subsection, let us consider, as a last point, the following sentences where a concessive clause contains two wh words:

- (37) a. [ kauru kohaa<sub>1</sub>-tə aawa-t ] Chitra nowarədəwaamə  
who where-DAT come-Q Chitra always  
e<sub>1</sub> pitat welaa yanəwa.  
∅ out become go  
'No matter who comes where, Chitra always goes  
(there).'
- b. [ kauru<sub>1</sub> kohaa-tə aawa-t ] Chitra nowarədəwaamə  
who where-DAT come-Q Chitra always  
e<sub>1</sub> hambə wennə hadənawa.  
∅ meet become want  
'No matter who comes where, Chitra always wants to  
meet (him).'

Interestingly, both of the wh phrases in (37) appear to be capable of binding a zero pronoun situated in the matrix clause, depending on the grammatical environment in which they are used. Notice that the concessive clauses in (37) are very close in meaning to multiple wh questions in the sense that the wh phrases are understood as taking the same scope. As was argued in Chapter 2, since multiple wh questions are assumed to involve unselective binding, it is naturally anticipated that the concessive clauses, which have multiple occurrence of wh words, are also subject to unselective binding. If this supposition is accepted, there is nothing mysterious about the fact that both of the wh phrases

can have full sentential scope simultaneously, since the concessive clause at issue can have an LF structure like (38):

(38) [ [<sub>CP</sub> kauru<sub>i(j)</sub> [<sub>IP</sub> t<sub>i</sub> kohaa<sub>(j)</sub>-tə aawa ] -t<sub>i(j)</sub> ]<sub>i(j)</sub>  
 .... e .... ]

Since the distinction between direct coindexing and coindexing by way of unselective binding does not matter in encoding scope (cf. Chapter 5), both wh phrases can be coindexed with -t either by direct coindexing or by coindexation through unselective binding. In this situation, since the scope index of both wh phrases can be carried over to -t, as in (38), a zero pronoun which lies in the matrix clause can be bound by either of the wh phrases, as is predicted by our system. To explain the distribution of the variable-binding of zero pronouns, thus, the only assumption needed is the grammatical operation of unselective binding (sometimes, as well as pied piping), which enjoys a substantial independent motivation.

#### 4.2.2. Existential Concessive Clauses

Sinhalese has another type of concessive construction, which we call an 'existential' concessive clause.<sup>9</sup> The

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9. The existential version of concessive clauses is impossible in Japanese, as the unacceptability of (i) shows:

peculiarity of this construction lies in the fact that the concessive clause is headed by the existential Q particle -hari, instead of the universal Q particle -t, as in (39):

- (39) [ Chitra kauru ekkərəgenə aawa-hari ] Ranjit  
 Chitra who bring come-Q Ranjit  
 satutu wenəwa.  
 pleased become  
 'For some x, x is a person, if Chitra brings x,  
 Ranjit is happy.'

When we look at the existential version of concessive clauses, essentially the same pattern as we saw in the universal concessives emerges with regard to the possible scope interaction and the pronominal binding. In this subsection, therefore, instead of rehearsing the entire sequence of the discussion presented in the preceding subsection, let us narrow down our focus and restrict ourselves to the question of whether we gain another confirmation for the particular analysis we are advocating.

To this point, we are assuming that the tactic of appealing to the scope interaction observed between a wh phrase in a concessive clause and a quantifier in a matrix clause can shed some light on the nature of pied piping which takes place in a concessive clause. As we shall discuss below, this also provides us with a reasonable way of analyzing ex-

- 
- (i) \*[ dare-ga ki-te ka ] boku-wa kamawa-nai  
 who-NOM come Q I-TOP care-not

istential concessive clauses in Sinhalese. With this in mind, first, consider the following:

- (40) [ monə-katəkataawə æhuna-hari ] kauru-t wiswaasə  
 what rumor be heard-Q who-Q believe  
 kərənəwa.  
 do  
 (a) 'There exists some x, x is a rumor, for all y, y is a person, if x comes in, y believes.'  
 (b) 'For all y, y is a person, there exists some x, x is a rumor, if x comes in, y believes.'

As is expected, the sentence in (40) is ambiguous; either monə-katəkataawə or kauru-t can scope over the other. The (a) paraphrase represents the reading in which the choice of the value of matrix quantified phrase depends on the choice of the wh phrase, and the paraphrase (b) the converse. What is important in the context of the present discussion is the fact that these scope dependencies are treated as akin to the dependencies manifested by quantifiers in the same clausal neighborhood in a multiply quantified sentence. Under our view, the sentence in (40) is assumed to receive interpretations by way of an LF construal like (41):

- (41) [ [CP monə-katəkataawə<sub>1</sub> [IP t<sub>1</sub> æhuna ] -hari<sub>1</sub> ]<sub>1</sub>  
 [IP kauru-t<sub>3</sub> [IP t<sub>3</sub> wiswaasə kərənəwa ]]]

In the LF construal in (41), the concessive clause which carries the scope index of monə-katəkataawə, which lies

within the concessive clause, constitutes a  $\Sigma$  sequence with the matrix quantified phrase kauru-t, and this means that the sentence can convey the sense that there is a particular rumor which everyone believes or the sense that for each person, there is a rumor that is believed. Utility of allowing this is that the analysis enables us to treat the interpretive facts regarding the concessive clause in (40) in a manner which is consistent with the familiar pattern of QR, without positing ad hoc operations.

A similar account extends to a concessive construction in which we find a wh phrase embedded in a complex NP. In such a case, as is shown below, a complex NP is found to commute with a matrix quantified phrase in terms of scope:

- (42) [ [ kauru hæduwa ] katəkataawə æhuna-hari ] kauru-t  
       who made up rumor be heard-Q who-Q  
       wiswaasə kərənəwa.  
       believe do  
       (a) 'There is some x,y, x is a person, y is a rumor x  
       made up, for all z, z is a person, if y comes in, z  
       believes.'  
       (b) 'For all z, z is a person, there is some x,y, x is  
       a person, y is a rumor x made up, if y comes in, z  
       believes.'

The ambiguity of (42) can be explained if it is assumed that the complex NP containing the wh phrase kauru, as a whole, undergoes Wh raising at LF, and that an LF structure like (43) is yielded, as a result of LF pied piping:

(43) [ [<sub>CP</sub> [ kauru hæduwa ] katəkataawə<sub>1</sub> [<sub>IP</sub> t<sub>1</sub> æhuna ]  
 -hari<sub>1</sub> ]<sub>1</sub> [<sub>IP</sub> kauru-t<sub>j</sub> [<sub>IP</sub> t<sub>j</sub> wiswaasə kərənəwa ]]]

The LF structure (43) illustrates the logical form of the sentence in which the complex NP can interact scopally with the matrix quantified phrase kauru-t. As shown in (42), in effect, we know that the sentence is ambiguous with regard to the scope of [kauru hæduwa] katəkataawə in the concessive clause and kauru-t in the matrix clause, with either [kauru hæduwa] katəkataawə or kauru-t being interpreted as standing within the scope of the other. The salient property of the scope ambiguity found in (42) gives us a clear indication that LF pied piping is pertinent to an existential concessive clause like (42), yielding an LF structure like (43).

Turning now to cases involving variable-binding, we also find that the existential concessive patterns exactly like the universal concessive. To see this, consider the following sentence:

(44) [ Chitra kauru<sub>1</sub> ekkərəgenə aawa-hari ] mamə e<sub>1</sub> hambə  
 Chitra who bring come-Q I Ø meet  
 wen nææ.  
 become not  
 'For some x, x is a person, if Chitra brings x, I will  
 not meet (him).'

As is expected, the zero pronoun in (44), which is in the scope domain of the existential concessive, can be understood

as a bound variable of kauru. Since the scope of a wh phrase like kauru is allowed to exceed beyond the clause in which it originates, just as is the case with a universal concessive clause, a zero pronoun in the main clause may be bound by kauru in cases like (44) (as long as the concessive clause containing it c-commands the pronoun).

This facet of the fact can be afforded a natural account if we assume that the Q affix -hari determines the interpretive nature of the particular syntactic phenomenon, just as in -t in a universal concessive. If this is correct, (44) is regarded as having an LF representation like (45):

(45) [ [<sub>CP</sub> kauru<sub>i</sub> [<sub>IP</sub> Chitra t<sub>i</sub> ekkərəgenə aawa ] -hari<sub>i</sub> ]<sub>i</sub>  
 .... ]

It is now quite clear that the general scope property of the wh phrase in the concessive results from the grammatical operation of LF Wh fronting by which the wh phrase is carried into the specifier position of the concessive, as a result of which the wh phrase is allowed to take full sentential scope by virtue of the coindexation with -hari.

While maintaining the assumption that the scope property of a concessive clause is determined depending on whatever is moved into the specifier position of the concessive clause by Wh movement, let us now proceed to consider some cases in which a concessive clause has a wh phrase located inside an

island:

- (46) a. [ Chitra [ kauru liyəpu ] potə<sub>1</sub> arəgenə aawa-hari ]  
Chitra who wrote book bring come-Q  
mamə e<sub>1</sub> kieuwa.  
I Ø read  
'For some x,y, x is a person, y is a book x wrote  
if Chitra brings y, I read (it).'
- b. \*[ Chitra [ kauru<sub>1</sub> liyəpu ] potə arəgenə aawa-hari ]  
Chitra who wrote book bring come-Q  
mamə e<sub>1</sub> hambə wen nɛɛ.  
I Ø meet become not  
'For some x,y, x is a person, y is a book x wrote  
if Chitra brings y, I do not meet (him).'

As matters turn out, the entire complex NP, which contains a wh phrase, is capable of binding a zero pronoun in the main clause, but the same kind of binding will be upset if we alter the grammatical environment in such a way that the zero pronoun is intended to get bound by the wh phrase kauru located inside the complex NP. The discrepancy in acceptability between the minimally contrasting examples (46a) and (46b) clearly indicates that a wh phrase is prohibited from binding a zero pronoun in the main clause if it is on a syntactic island like a complex NP (while binding is permitted if it is not located in an island).

The generalization concerning the difference in grammaticality between (46a) and (46b) must be grasped on the assumption that the relevant LF Wh movement pied pipes the entire sequence of the island into COMP, as in (47):



(47) [ [CP [ kauru liyəpu ] potə<sub>1</sub> [IP t<sub>1</sub> arəgenə aawa ]  
 -hari<sub>1</sub> ]<sub>1</sub> ..... e ..... ]

In the configuration given in (47), the complex NP, but the wh word, is taken as quantifying, and the entire island is identified as a relevant wh expression to be coindexed with hari. In our repertoire, since there is no operation to bring about the effect that the wh phrase kauru gets governed by the Q element, only the scope of the whole island is allowed to extend beyond the concessive clause, binding a zero pronoun outside of it. This proposed analysis, whereby we introduce the system of pied piping into the interpretive system of a concessive clause, is able to account for the judgments given in (46) in an intuitively satisfying way. If this line of analysis is correct, it can then be stated that what allows pronoun binding in sentences such as (46a), but not (46b), is the fact that the entire island containing a wh phrase is moved by LF Wh raising and is coindexed with the Q element. This observation then leads us to conclude that pied piping constitutes a grammatical operation that dictates the well-formedness of a sentence like (46a), which is, again, in full conformity with our analysis of pied piping.

#### 4.3. Summary

In the discussion of the two types of concessive con-

structions, i.e. the universal concessive and the existential concessive, we have argued that the peculiar scope properties of a wh phrase embedded in a concessive clause can be traced back to the presence of a Q element that it coindexes with in LF, and that the Sinhalese concessive clauses, basically, pattern with ordinary quantified expressions, contrary to their superficial appearances. We have also argued that the concessive clauses in Sinhalese may involve the LF operation of pied piping and that the apparent immunity to Subjacency is explained away by reference to LF pied piping. In this respect, the Sinhalese concessive constructions offer an interesting confirmation for the analysis which we are advocating.

## CHAPTER 5

### THE LF OUTPUT OF PIED PIPED SENTENCES

#### 5.1. Introduction

In the preceding chapter, we have argued, on the basis of Sinhalese data, that a theory of concessive clauses can be developed so as to preserve the central claim advanced in dealing with LF Wh movement occurring in wh questions. In so doing, we have claimed that LF pied piping plays a crucial role in determining the well-formedness of the LF formation of the concessive construction if a wh phrase is embedded within an island.

One interesting feature of our analysis is that pied piping is essentially regarded as a case of reanalysis, where an island is analyzed as a relevant wh expression to move in place of a wh phrase. Under our treatment, LF pied piping is performed without reference to a wh phrase embedded in an island. The view advanced here strongly suggests that in cases where LF pied piping takes place, Wh movement should not occur internally within an island, at least for the purpose of licensing (by a Q element), contrary to the suggestion advanced by Nishigauchi (1986, 1990).

However, since we are, at this point, still left with

the question of whether a wh phrase located inside an island actually undergoes Wh movement so as to get governed by a Q element, we will take a look at concessive clauses in Japanese, and show, as our analysis suggests, that governance by a Q element is indeed irrelevant to a wh phrase located inside a syntactic island.

The present chapter shows that concessive clauses can provide a key to the explanation for the internal structure of a pied piped constituent and argues that the concessive construction can offer us some hard evidence in conformance with our view. In the present chapter, we will demonstrate that if pied piping occurs at LF, no internal Wh movement is invoked to the effect that a wh phrase inside a syntactic island comes to get governed by a Q element.

## 5.2. Concessive Clauses in Japanese

The theory developed thus far has the advantage of explaining why LF Wh movement voids Subjacency effects, while maintaining the assumption that Subjacency is a viable constraint on movement. A good deal of impetus behind our notion of LF pied piping comes from the fact that a wh phrase contained within an island can be assigned scope via LF fronting of the entire island, instead of movement of the wh phrase. In our conception, since the entire sequence of strings forming an island can be reanalyzed as a 'relevant'

wh expression to move, replacing the wh word, it is naturally expected that Wh raising inside an island should be foreign to the pied piping formation.

As discussed previously, in effect, in view of the fact that pied piping is excluded with wh questions with naze, it seems reasonable to state that Wh movement may void the effect of Subjacency only if a wh phrase which resides in an island is not affected by Wh fronting. What we claim here is that our intuition that pied piping is permissible if a wh phrase is allowed to remain in place (throughout derivations) is correct. To confirm the validity of our analysis, we will provide in what follows the evidence that a wh phrase which appears inside an island, in fact, is not affected by Wh fronting and that it will not be vacated from its original position inside the island even in LF.

To the extent that we uphold the assumption that LF movement of a wh phrase may not escape the effect of Subjacency even in LF, and that we explain the absence of Subjacency in LF by the concept of pied piping, our analysis is, more or less, in agreement with the analysis by Nishigauchi (1986, 1990). The details of the two analyses, however, crucially differ in the following respect: Since Nishigauchi (1986, 1990) takes percolation as the basis for pied piping, movement of a wh phrase is assumed to occur inside an island in order to ensure the effect of pied piping. In contrast to this, what we claim in this chapter is that pied piping is,

basically, possible as long as a wh phrase is permitted to stay in its surface position without movement.

Our alternative analysis, which proposes a new way of forming a pied piped constituent, sharply contrasts with Nishigauchi's analysis, which assumes Wh movement inside an island, as is shown below:

- (1) a. [CP [NP WH<sub>1</sub> .. t<sub>1</sub> .. ]<sub>3</sub> [IP .... t<sub>3</sub> .... ] ]  
           |\_\_\_\_\_||  
           |\_\_\_\_\_||  
           |\_\_\_\_\_||
- b. [CP [NP ... WH ... ]<sub>1</sub> [IP .... t<sub>1</sub> .... ] ]  
           |\_\_\_\_\_||  
           |\_\_\_\_\_||

It appears that Nishigauchi's proposal is open to several criticisms on conceptual grounds. One of the serious conceptual difficulties in his analysis lies in the fact that a syntactic island, in most cases, does not offer an appropriate stopping site for a wh word.<sup>1</sup> The absence of a landing site for Wh movement within an island casts doubt on the adequacy of positing internal Wh movement, because the analysis requires stipulating an adjunction operation of a wh

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 1. It seems that Nishigauchi (1986, 1990) considers the specifier position of a complementizer, located inside of an island, as a possible landing site for a wh phrase, when pied piping takes place. Although this is a possibility, it is generally considered that a complementizer is occupied by a null operator in a complex NP like a relative clause, so that it is not likely that the complementizer offers a landing site for a wh phrase in such a case.

phrase, which we claim has not been attested yet.<sup>2</sup> Since Wh movement is, in general, considered as a substitution operation, allowing adjunction for Wh movement significantly weakens the force of the argument. Furthermore, data from Sinhalese seems to empirically falsify his argument, because a pied piped constituent is identifiable before the putative percolation process takes place in LF.

In spite of these conceptual problems, the question of whether or not Wh fronting moves a wh phrase within an island is still a subtle issue. Since the point made by Nishigauchi (1986, 1990) is that a wh phrase located in an island is required to move to get governed by a Q element (through a percolation chain), the locus of the issue will be whether or not a wh phrase within an island is governed by a Q element at LF, as Nishigauchi argues. Contrary to what he claims, there appears to be good reason to believe that movement of a wh phrase does not occur inside an island and that the wh phrase is not governed by a Q element even at LF. In the subsequent sections, we will provide some arguments that

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2. There are languages, i.e. Slavic languages, which move all wh phrases to a clause-initial position in the mapping of D-structure onto S-structure, and it might be claimed that these languages counter-exemplify our claim. The issue of whether all wh phrases are moved by Wh raising alone or these wh phrases are moved by some other rules (plus Wh movement) is, however, still arguable. Since wh phrases are required to be in a focus position in these languages, it may well be the case that wh phrases, especially, secondary wh phrases, are not moved by Wh movement. (cf. Wachowicz (1974a, 1974b), Toman (1981), Comorovski (1986), Rudin (1988))

count against Nishigauchi's general approach. The remaining two subsections are devoted to determining the status of a wh phrase located inside a syntactic island.

### 5.2.1. Scope Relations

As a first step toward a discovery of the nature of a wh phrases inside an island, let us first consider how the quantificational force of wh phrases is articulated in syntax. Since the primary function of wh phrases is quite similar to that of free variables (indeterminate pronouns), first of all, we assume, with Kuroda (1965), that wh phrases do not have their own quantificational force, and their quantificational force is externally assigned by a Q element:

- (2) dare-mo-ga dare-ka-o ai-si-te-iru.  
who-Q-NOM who-Q-ACC love  
'Everyone loves someone.'

In (2), the first occurrence of dare is associated with the universal particle mo and the second occurrence of dare is in combination with the existential particle ka. The first wh phrase, then, has a universal import and the second an existential import, conveying the sense of everyone and someone, respectively.

Of these Q elements, what is of theoretical interest in the context of the present discussion is the behavior of the



Q particle mo, and we are particularly interested in the fact that the Q element mo, as opposed to ka, is allowed to function as some kind of Q-domain marker as well as a scope marker (in our terminology). With this in mind, consider the following:

- (3) Taroo-wa [ dare-ga kat-ta ] hon-mo yon-da.  
Taroo-TOP who-NOM bought book-Q read.  
'For all x,y, x is a person, y is a book x bought,  
Taroo read y.'

The sentence in (3), intuitively, expresses quantification over the range of books whose identification is made through the identity of writers, thereby asserting that John read every book.<sup>3</sup> As the Q element mo is attached to the complex NP in place of dare in this case, the Q element is taken to assign its quantificational force to the complex NP that contains dare rather than dare alone, but still, the complex NP in the sentence involves universal quantification quite similar to that of dare-mo 'everyone' in (3), having a universal import.<sup>4</sup> Furthermore, it should be recognized that

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3. To be strict, as will be argued below, the logical formula in (3) does not correctly represent the semantic interpretation associated with the sentence in (3). For the lack of a logical formula or an English paraphrase correctly encoding our intuition, we will, for convenience sake, adopt the notation that is implemented in Nishigauchi (1986, 1990). We presume here, however, that the logical paraphrase is, in most cases, close enough to capture the semantics involving a wh phrase inside of a complex NP.

4. Note that the following sentence is parallel to (3) in every respect except for the choice of the Q particle, but it

the Q element mo may also serve as a scope marker, standing in a clause final position:

- (4) [ dare-ga ki-te mo ] boku-wa kamawa-nai.  
who-NOM come Q I-TOP care-not  
'No matter who comes, I don't care.'

The sentence in (4) addresses the proposition that whoever may turn up, the speaker does not care at all. Although the Q element mo is not adjacent to dare, the semantics of the wh expression in the concessive clause is virtually identical to that of dare-mo in (2). That is to say, the sentence in (4) involves universal quantification whose value ranges over individuals concerning dare.

Since the Q particle mo in concessive clauses may appear in a scope position from which a wh phrase takes scope, it is conceivable that movement of a wh phrase into COMP is involved in a concessive clause like (5):

- (5) [ Taroo-ga dare-o ture-te-ki-te mo ] Hanako-wa  
Taroo-NOM who-ACC bring Q Hanako-TOP  
yorokon-da.  
was pleased.  
'No matter who Taroo brought, Hanako was pleased.'

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is ungrammatical:

- (i) \*Taroo-wa [ dare-ga kat-ta ] hon-ka yon-da  
Taroo-TOP who-NOM bought book-Q read

This shows that Japanese does not have an adverbial particle which can be used existentially.

If this is correct, the LF operation of Wh fronting yields the following LF construal:

- (6) [ [<sub>CP</sub> dare-o<sub>i</sub> [<sub>IP</sub> Taroo-ga t<sub>i</sub> ture-te-ki-te ] mo ]  
Hanako-wa yorokon-da ]

A piece of evidence that supports this view can be drawn from the fact that concessive clauses exhibit the same pattern of island violations as their corresponding Wh questions, whose LF construals we claim to be derived via LF applications of Wh movement. Now, observe the parallelism in the effect of Subjacency below:

- (7) a. ?\*Taroo-wa [ Jiroo-ga dare-o ture-te-kuru  
Taroo-TOP Jiroo-NOM who-ACC bring  
ka-doo-ka ] sit-te-iru no?  
whether know Q  
'Who does Taroo know whether Jiroo will bring?'
- b. ??[ Taroo-ga [ Jiroo-ga dare-o ture-te-kuru  
Taroo-NOM Jiroo-NOM who-ACC bring  
ka-doo-ka ] sit-te-ite mo ] boku-wa kamawa-nai.  
whether know Q I-TOP care-not  
'No matter who Taroo knows whether Jiroo will bring,  
I do not care.'

In (7), both of the sentences exhibit the effect of Wh island violation.<sup>5</sup> The parallelism in acceptability found between

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5. A Wh island violation is considerably ameliorated when plausible candidates for the value of a wh phrase is contextually furnished. Example (7b) appears to be a case in point.

these examples is readily accounted for if we assume that the scope of dare in (7b), as well as the scope of dare in (7a), is indeed derived via Wh raising, which assigns scope to dare by moving it to the operator position. The island effects observed in the sentences above show that Wh fronting is indeed instantiated in their LF formation, and it is also consistent with the fact that the quantificational force of dare can be encoded by the Q element mo, albeit the wh phrase is separated from mo at the surface level.

Interestingly, just as a wh phrase is allowed to appear inside a complex NP without a Subjacency violation, so a wh phrase in a concessive clause is permitted to show up inside a complex NP without an island violation. In such a concessive clause, just as in a wh question, pied piping appears to constitute a ubiquitous grammatical process in interpreting a wh phrase within a syntactic island, as the acceptability of (8) suggests:

- (8) [ [ dare-ga kat-ta ] hon-o yon-de mo ] Taroo-wa  
       who-NOM bought book-ACC read Q Taroo-TOP  
 omosiro-gat-ta.  
 got pleased  
 'For whatever x,y, x is a person, y is a book x bought,  
 Taroo was pleased if he read y.'

As is expected, the concessive clause of the sentence in (8) contains a quantificational expression, i.e. the complex NP [ dare-ga kat-ta ] hon. The quantificational expression [

dare-ga kat-ta ] hon is considered as ranging over the set of books and its identification is made in terms of the identity of the wh phrase. The fact that the complex NP quantifies over the range of books, coupled with the acceptability of the sentence, strongly suggests that the LF construal of the sentence is formed by movement of the entire island by way of pied piping, as is represented in (9):

(9) [ [CP [ dare-ga kat-ta ] hon-o<sub>1</sub> [IP t<sub>1</sub> yon-de ] mo ]  
 Taroo-wa omosiro-gat-ta ]

By postulating the pied piping operation, which is indicated above, we can elucidate the problem of the apparent absence of island effects in a concessive clause found in (8), while preserving island conditions at the LF level. Given the fact that the concessive clause is well-formed even with a wh phrase inside a complex NP, just as in the case of a Wh question, it should be reasonable to conclude that pied piping takes effect even in a concessive construction like (8).

In conjunction with the theory of pied piping, it must be recognized that since pied piping is, essentially, a case of reanalysis, a wh phrase located inside an island must be regarded as a part of a 'larger' wh expression. Since pied piping substitutes movement of an entire island for movement of a wh phrase, the operation yields a structure in which the island, instead of the wh phrase within the island, occupies

SPEC of CP. We presume here that when this type of operation applies, the whole island is interpreted as a wh expression whose value-determining part is the wh phrase, and the wh phrase can be assigned scope without violating Subjacency. In such a case, then, the value of the whole wh expression is identified through the identity of the wh phrase, and the interpretation on which the value of the whole island co-varies with the value of the wh phrase is obtained.<sup>6</sup>

As suggested earlier, we claim that pied piping involves the process that interprets a wh phrase within an island by reanalyzing the whole island as a 'relevant' wh phrase moved by means of Wh fronting. Since it is claimed on this account that pied piping is well formed just in case the wh phrase inside the island is permitted to stay in its original position, we will have to attend to the question of whether the wh phrase is unselectively bound by an externally binder, and in particular, to the question of whether a Q element assigns quantificational force to the wh phrase under the structural condition of government, as is contended by Nishigauchi (1986, 1990). For the purpose of providing an answer to this question, it will be argued from now on that unselective binding is not applicable to the wh phrase because its scope is assigned by way of the LF fronting of the entire island.

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6. The reason why the value of the island varies according to the value of the wh phrase is that only the wh phrase within the island has a range-setting property.

The important claim in this chapter is that the wh phrase, by virtue of constituting a part of the pied piped element in COMP, is interpreted from the position within the island without being governed by the Q element. In our proposed analysis, it is assumed that the interpretive property of a wh phrase within an island results from its undergoing the pied piping operation and the entire island being reanalyzed as a wh expression. This analysis claims that the pied piping operation, while permitting a wh phrase within an island to stay in its surface position, produces an LF structure in which the entire island is fronted and yields the effect of tolerating a structure in which a wh phrase is embedded in an island, which would otherwise be impermissible.

Our proposed analysis bears no close resemblance to Nishigauchi's analysis with respect to the hypothesized internal structure of a pied piped constituent. These two analyses, notwithstanding, appear to make similar predictions with regard to the scopal interaction found in a multiple quantification construction. For concreteness, first consider the following:

- (10) hutari-no sidookyookan-ga dono-ronbun-mo yon-da.  
 two-GEN supervisor-NOM which-paper-Q read.'  
 'Two supervisors read every paper.'

The sentence in (10) is unambiguous in regard to the scope of

the two quantified expressions. In (10), the quantified NP hutari-no sidookyookan 'two supervisors' is interpreted as taking scope over dono-ronbun 'every paper', which acquires a universal quantificational force in combination with the Q element mo, and the sentence carries the sense that there are exactly two supervisors who read every paper. But if dono-ronbun is scrambled over hutari-no sidookyookan, the sentence turns out to be ambiguous, either dono-ronbun or hutari-no sidookyookan enjoying scope over the other:

- (11) dono-ronbun-mo<sub>1</sub>, hutari-no sidookyookan-ga t<sub>1</sub> yon-da.  
 which-paper-Q two-GEN supervisor-NOM read  
 'Every paper, two supervisors read.'

In (11) the broad scope of dono-ronbun over hutari-no sidookyookan, as well as its reversed scope order, is allowed for the quantifiers, and the sentence can mean that for every paper written, there are exactly two supervisors who read the paper or that there exist only two supervisors who read all the papers. The fact that (11) is ambiguous in terms of the relative scope of the two quantifiers indicates that quantifiers can freely commute in scope in a sentence like (11), where one NP is scrambled across another NP. Although it is not our purpose to present a precise account for the presence or absence of scope ambiguity depending on word order, it is worthwhile to note that a quantifier may interact scopally with another quantifier in a sentence like (11), where one



quantifier is scrambled over the other.

Note in passing that this type of scope interaction is usually barred if quantifiers are not found in the same clausal neighborhood:

- (12) a. dare-ka-ga [ ano-sensei-ga dono-ronbun-mo yon-da  
who-Q-NOM that-teacher-NOM which-paper-Q read  
to ] omot-te-ita.  
that thought  
'Someone thought that the teacher read every paper.'
- b. [ ano-sensei-ga dono-ronbun-mo yon-da to ]<sub>1</sub>,  
that-teacher-NOM which-paper-Q read that  
dare-ka-ga t<sub>1</sub> omot-te-ita.  
who-Q-NOM thought  
'That the teacher read every paper, someone  
thought.'

In the cases at hand, the quantified NP dono-ronbun must have narrower scope than the quantified NP dare-ka, irrespective of whether the embedded clause is scrambled across dare-ka or not. These sentences contain two quantifiers but the only reading available is the one in which dare-ka takes scope over dono-ronbun, and they are not allowed to have the interpretation whose scope order is reversed, i.e. the one on which dono-ronbun takes broad scope with respect to dare-ka.<sup>7</sup>

Turning to cases of the concessive clause, we find that a contrast in scope possibility comparable to (10) and (11) is found in (13a) and (13b), regardless of the fact that nani

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7. This shows that QR is clause-bound in Japanese, just as in the case of English.

is deeply embedded in a concessive clause: (13a) has only interpretation under which nani has broader scope than dare-ka, whereas (13b), which is a scrambled version of (13a), exhibits the same kind of scope ambiguity as (11), i.e. nani can enjoy either broad or narrow scope with regard to dare-ka in (13b):

- (13) a. [ nani-ga okot-te mo ] dare-ka-ga monku-o  
 who-NOM happen Q who-Q-NOM complaint-ACC  
 it-ta.  
 said  
 'Whatever happened, someone complained.'
- b. dare-ka-ga<sub>1</sub>, [ nani-ga okot-te mo ] t<sub>1</sub> monku-o  
 who-Q-NOM what-NOM happen Q complaint-ACC  
 it-ta.  
 said  
 'Someone, whatever happened, complained.'

This pattern of scope ambiguity is generally found only if a multiple number of quantifiers appear within a single clause. In this particular case, however, dare is contained deeply within the concessive clause, but we still observe the same contrast that is found in (10) and (11). The fact will straightforwardly follow if it is assumed that dare in the concessive clause is subject to the familiar rule of Wh raising at LF, which moves dare into SPEC of CP in the concessive clause, and that the entire clause containing dare, as a whole, takes over the universal quantificational force of dare by coindexing with mo, as in (14):<sup>8</sup>

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8. It appears that there are two types of Japanese

- (14) a. [<sub>CP</sub> [<sub>CP</sub> nani-ga<sub>i</sub> [<sub>IP</sub> t<sub>i</sub> okot-te ] mo<sub>i</sub> ] dare-ka-ga  
 monku-o it-ta ]  
 b. [<sub>CP</sub> dare-ka-ga [<sub>CP</sub> nani-ga<sub>i</sub> [<sub>IP</sub> t<sub>i</sub> okot-te ] mo<sub>i</sub> ]  
 monku-o it-ta ]

The pre-QR concessive construals which are assigned a universal quantificational force are represented in the configurations in (14), in which dare is coindexed with mo as a consequence of dare-movement into SPEC of CP in the concessive clause. Note that each logical syntax in (14) correctly encodes the scope fact that the concessive clause carries a universal quantificational force, which is embodied by Wh fronting that moves a wh phrase to COMP. Given the LF construals in (14), it is, thus, correctly predicated that whereas (13a) is unambiguous with nani being construed as

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 speakers, one who finds a non-scrambled sentence like (i) unambiguous and the other who finds it ambiguous with respect to the relative scope order of the quantifiers:

- (i) dare-mo-ga dare-ka-o ai-si-te-iru.  
 who-Q-NOM who-Q-ACC love  
 'Everyone loves someone.'

Although our discussion is based on judgments by the native speakers of the first type, it should be noted that idiolectal variations among Japanese speakers do not affect the validity of our claim. Our argument will have the same explanatory force even with those speakers who find (i) ambiguous, because they will find (ii) ambiguous in the same way as (i):

- (ii) [ dare-ga ki-te mo ] dare-ka-ga monku-o ii-masu.  
 who-NOM come Q who-Q-NOM complaint-ACC say  
 'No matter who comes, someone complains.'

residing inside the scope of dare-ka, the scrambled version of the sentence in (13b) is allowed to vary freely in scope, patterning like (11).

It can be readily demonstrated that the same facts obtain for sentences involving pied pied constituents. It will turn out, upon close scrutiny, that these sentences also involve the procedure of scope determination which appears to be applicable to (10) and (11). First, consider the following:

- (15) a. hutari-no sidookyookan-ga [ dare-ga kai-ta ]  
 two-GEN supervisor-NOM who-NOM wrote  
 ronbun-mo yon-da.  
 paper-Q read  
 'For two x, x is a supervisor, for every y,z, y is a person, z is a paper y wrote, x read z.'
- b. [ dare-ga kai-ta ] ronbun-mo<sub>1</sub> hutari-no  
 who-NOM wrote paper-Q two-GEN  
 sidookyookan-ga t<sub>1</sub> yon-da.  
 supervisor-NOM read  
 (a) 'For two x, x is a supervisor, for every y,z, y is a person, z is a paper y wrote, x read z.'  
 (b) 'For every y,z, y is a person, z is a paper y wrote, for two x, x is a supervisor, x read z.'

As far as the relative scope of the quantified NPs hutari-no sidookyookan and [ dare-ga kai-ta ] ronbun is concerned, we find the same type of scope relations in (15) as we observed in (10) and (11). In (15a), the NP hutari-no sidookyookan stands outside the scope of the pied piped phrase [ dare-ga kai-ta ] hon, while hutari-no sidookyookan in (15b) may be understood as standing inside or outside the scope of the

quantified phrase [ dare-ga kai-ta ] hon. The same restriction is also observed in a sentence like (16), where a concessive clause apparently involves pied piping in an analogous way as (15):

- (16) a. [ [ dare-ga kai-ta ] tegami-o yon-de mo ]  
           who-NOM wrote letter-ACC read Q  
           dare-ka-ga monku-o it-ta.  
           who-Q-NOM complaint-ACC said  
           'For whatever x,y, x is a person, y is a letter x  
           wrote, for some z, z is a person, when I read y, z  
           complained.'
- b. dare-ka<sub>1</sub>-ga [ [ dare-ga kai-ta ] tegami-o yon-de  
           who-Q-NOM who-NOM wrote letter-ACC read  
           mo ] t<sub>1</sub> monku-o it-ta.  
           Q complaint-ACC said  
           (a) 'For whatever x,y, x is a person, y is a letter  
           x wrote, for some z, z is a person, when I read y,  
           z complained.'  
           (b) 'For some z, z is a person, for whatever x,y, x  
           is a person, y is a letter x wrote, when I read y,  
           z complained.'

As the attempted logical paraphrase indicates, the sentence in (16a) is unambiguous, and dare-ka appears to be read only as being inside the scope of the complex NP [ dare-ga kai-ta ] tegami. In contrast, the sentence in (16b) is ambiguous between two readings, either of the two quantified expressions taking broad scope over the other.<sup>9</sup>

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 9. The kind of scope ambiguity which is found in (16) shows that Wh movement rather than QR is involved in the interpretation of the sentence. If it were the case that the pied piped element is raised by QR and that the wh phrase inside is moved into COMP by Wh movement, which is suggested as a possibility in Hasegawa (1986), we would not expect the scope interpretation shown in (16), for this claim amounts to stating that only the wh phrase is coindexed with the Q element

The problem of proffering an analysis of the internal structure of a pied piped constituent appears to be compounded by the fact that a wh phrase inside a complex NP prima facie acts like a universal quantifier, displaying scope interaction with a quantifier outside. For illustration, consider the following:

- (17) hutari-no kyoozyu-ga [ dare-ga kai-ta ] ronbun-ni-mo  
 two-GEN professor-NOM who-NOM wrote paper-DAT-Q  
 syomei-si-ta.  
 signed  
 'For two x, x is a professor, for whatever y,z, y is a person, z is a paper y wrote, x signed on z.'

In (17), dare can be taken as quantificational, ranging over individuals, e.g. {John, Bill, Mary}, and the entire NP [dare-ga kai-ta] ronbun is, then, considered as a quantificational expression, which ranges over the set of papers, i.e. {John's paper, Bill's paper, Mary's paper}. What is remarkable about this sentence with regard to the scope relation of the quantified expressions is that dare in the complex NP is understood to take narrow scope over hutari-no kyoozyu in a given case and that the sentence conveys the sense that two professors are present for the entire writer-paper pairs. If the complex NP is moved over the subject NP, the sentence prima facie comes to sound ambiguous with regard to the scope

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mo. The scope fact clearly indicates that Wh movement may pied pipe an island with a wh phrase.

of dare and hutari-no kyoozyu:

- (18) [ dare-ga kai-ta ] ronbun-ni-mo<sub>1</sub>, hutari-no  
who-NOM wrote paper-DAT-Q two-GEN  
kyoozyu-ga t<sub>1</sub> syomei-si-ta.  
professor-NOM signed  
(a) 'For whatever x,y, x is a person, y is a paper x  
wrote, for two z, z is a professor, z signed on y.'  
(b) 'For two z, z is a professor z, for whatever x,y,  
x is a person, y is a paper x wrote, z signed on y.'

The sentence in (18) can have the (a) interpretation, which implies 'two professors' per author-paper pair, viz. two professors for each member of the set {John's paper, Bill's paper, Mary's paper}, or the (b) interpretation, which implies only two professors for the entire set of the author-paper pairs, i.e. for the whole set {John's paper, Bill's paper, Mary's paper}. The crucial point to be noticed here is that the wh word dare apparently interacts scopally with hutari-no kyoozyu, acting like a quantifier residing in the same clausal neighborhood, even though dare is deeply embedded in the complex NP.

In exactly the same vein, we observe that this sort of scope interaction is found in cases where concessive clauses involve pied piping, as in (19):

- (19) [ [ dare-ga kai-ta ] ronbun-ga teisyutu-sare-te mo ]  
who-NOM wrote paper-NOM is sent in Q  
sannin-no sinsain-ga sinsa-o suru.  
three-GEN judge-NOM evaluate-ACC do  
'For three x, x is a judge, whatever y,z, y is a person,  
z is a paper y wrote when z is sent in, x evaluates.'

In view of the fact that the sentence has an interpretation on which [dare-ga kai-ta] ronbun is construed as enjoying broad scope over sannin-no sinsain, it appears true that the quantified NP sannin-no sinsain is defined over the set of writer-paper pairs, e.g. {John's paper, Bill's paper, Mary's paper}. It will, then, be the case that in (19), there are a plural number of judges, whose 'group' number corresponds to that of author-paper pairs. Interpretively, thus, the scope of dare is understood as falling outside the scope of sannin-no sinsain. On the other hand, if the order of [dare-ga kai-ta] ronbun and sannin-no sinsain is reversed, then the sentence comes to sound ambiguous with regard to the scope of dare and sannin-no sinsain:

- (20) sannin-no sinsain-ga<sub>1</sub>, [ [ dare-ga kai-ta ] ronbun-ga  
 three-GEN judge-NOM who-NOM wrote paper-NOM  
 teisyutu-sare-te mo ] t<sub>1</sub> sinsa-o suru.  
 is sent in Q evaluate-ACC do  
 (a) For whatever x,y, x is a person, y is a paper x  
 wrote, for three z, z is a judge, when y is sent in,  
 z evaluates.'  
 (b) For three z, z is a judge, for whatever x,y, x is a  
 person, y is a paper x wrote, if y is sent in, z  
 evaluates.'

As is predicted, the sentence is ambiguous with regard to the scope of sannin-no sinsain and [dare-ga kai-ta] ronbun, either one taking scope over the other. Since dare is embedded in the complex NP in the case at hand, the sentence



then comes to sound as if there is scope interaction between dare and sannin-no sinsain, dare being understood as standing inside or outside sannin-no sinsain.

In order to account for this fact, Nishigauchi will claim that the sort of scope interaction that we observed above is derived from the following LF construal in which dare as well as the entire complex NP is governed by the Q element mo, with the proviso that Q elements may serve as unselective binders:

(21) [ [CP [NP dare-ga<sub>j</sub> [[ t<sub>j</sub> kai-ta ] ronbun-ga ]]<sub>1</sub> [IP t<sub>1</sub> teisyutu-sare-te ] mo<sub>1,j</sub> ]<sub>1,j</sub> sannin-no sinsain-ga sinsa-o suru ]

The resultant LF representation is yielded by the movement of the entire NP in addition to the internal movement of dare. Since dare gets adjoined to the complex NP and undergoes percolation, the Q element mo comes to govern both the complex NP and the wh phrase contained within it. (Nishigauchi (1986, 1990), in fact, argues that the Q element mo can, in this guise, assign its quantificational force to two quantified expressions in unselective fashion, and both the whole NP and dare inside it can acquire universal imports.) The crucial point here is that in his analysis, both the wh phrase and the whole NP are understood as being governed by the Q element, so that it is possible to claim that these ex-

pressions are both allowed to participate in scope interaction with a quantifier residing in the matrix clause.

Under our account, in contrast, the irksome fact that the embedded quantifier dare can seemingly have scope outside the minimal clause containing it and that it is interpreted as having scope over sannin-no sinsain can be readily captured by the hypothesis that the entire NP is treated as a wh expression to move as a consequence of pied piping. In this analysis, the complex NP is, in essence, analyzed as a 'wh' expression whose value is determined by way of the value of the wh phrase, and no internal Wh movement is utilized, as illustrated below:

(22) [ [CP [ dare-ga kai-ta ] ronbun-ga<sub>i</sub> [IP t<sub>i</sub> teisyutusare-te ] mo<sub>i</sub> ]<sub>i</sub> sannin-no sinsain-ga sinsa-o suru ]

Since we are claiming that the value of the whole NP is identified through the identity of individuals pertaining to dare, we can predict that the interpretation on which the wh phrase dare is understood as outside the scope of sannin-no sinsain is available if the entire NP [ dare-ga kai-ta ] ronbun enjoys wide scope with regard to sannin-no sinsain. On the other hand, if [ dare-ga kai-ta ] hon is understood as within the scope of sannin-no sinsain, then we can readily expect that dare is automatically read as being in the scope of sannin-no sinsain.

Furthermore, the problem of how the wh phrase may apparently assume a universal quantificational force can be readily explicated in this treatment as well. As argued previously, our alternative model states that the wh phrase dare is not construed with the Q element, but the universal interpretation of dare is deducible from the fact that dare constitutes a part of 'larger' wh expression. Under this account, it is viewed that the value of the entire NP is understood to co-vary with the value of the wh phrase, as a consequence of a pied piping operation. This means that the quantificational force of the wh phrase is determined depending on the quantificational force of the complex NP. If the complex NP is assigned a universal quantificational force by mo, then the wh phrase is interpreted to assume the same quantificational force, even though the wh phrase is not directly construed with mo.

As illustrated above, the correlation between the scope of the complex NP and the wh phrase contained within it, together with the apparent lack of the boundedness requirement for the scope of dare, can follow from our assumptions, without committing ourselves to the movement of dare inside the complex NP. The relevant cases of the scope of wh phrases within complex NPs considered so far suggests that the set of data presented here, in fact, does not necessarily help us choose one analysis over the other. In view of the fact that Nishigauchi's analysis, unlike ours, requires the

multitude of additional maneuvers, however, it should be clear, especially, from the discussion above, that our alternative model should be preferable to Nishigauchi's analysis. Owing to a complicating factor involving scope relations concerning a pied piping constituent, the force of our argument is somewhat weak here, but it is clear that our formulation of pied piping can provide us with a simple but complete account, without any need for setting up additional apparatus.

Although both analyses make similar predictions on the scope dependency found between a pied piped element and a quantifier in its vicinity, their predictions seem to differ in a subtle way in regard to the scope relation between a wh phrase and the complex NP it forms a part of. One interesting argument concerning this point may be drawn from an observation made by Ohno (1989). To see this, consider the following example:

- (23) sensei-wa [ dare-ga kai-ta ] repooto-mo uketot-ta.  
 teacher-TOP who-NOM wrote report-Q received  
 'For every x,y, x is a person, y is a paper x wrote,  
 the teacher received y.'

The scope interpretation associated with the island and the wh phrase embedded within it in (23) is one on which the value of the head NP repooto is defined over the set of individuals denoted by dare. (cf. Kadmon (1987, 1990)) This intuition can be highlighted when we consider what makes (23)

true or false. Consider, for example, a situation in which one student wrote five papers and the other three students one paper each. Suppose further that the teacher received two papers from the first student and the rest of the students submitted one paper each. Under this condition, (23) would be true even though the class of papers is not exhausted. For (23) to be true the teacher would have to receive at least one paper from each student involved.

The crucial fact is, as observed by Ohno (1989), that the reading associated with a sentence like (23) is, interpretively, the one normally associated with an existential NP reposito embedded within the scope of dare, rather than the one associated with the universal wh phrase dare embedded within the scope of the existential NP reposito. If translated into the terms of a first order language, the logical formula in (24a), having dare-reposito order, is considered as a more accurate paraphrase for (23) than that in (24b):

- (24) a.  $\forall x[ \text{person}(x) \rightarrow \exists y[ \text{report}(y) \dots\dots ]$   
 b.  $\forall x,y[ \text{person}(x) \ \& \ \text{report}(y) \dots\dots ]$

Notice that the first logical formula in (24a), but not (24b), correctly encodes the intuition that the sentence says something about report-writers and that the range of the value of reposito is relative to the value assignment of dare.

The theoretical concern that naturally arises from such

an observation is how to articulate a theory which accounts for the peculiar scope behavior of a sentence like (23). We should first note that the fact that the pied piped element is interpreted in this way is incompatible with Nishigauchi's analysis, which makes internal Wh movement obligatory. Under his account, since a wh phrase may not be moved arbitrarily far away, the only LF construal available for (23) is one in which dare resides within the complex NP even in LF, as in (25a), but not (25b):

- (25) a. ... [NP [CP dare-ga<sub>1</sub> [IP t<sub>1</sub> kai-ta ]] repooto ] ...  
 b. ... [NP dare-ga<sub>1</sub> [NP [CP t<sub>1</sub> kai-ta ] repooto ]] ...

Given the assumptions that Nishigauchi maintains, the analysis runs into an immediate problem, since the derived LF structure, to start with, does not represent the correct interpretation. Furthermore, since Subjacency is a viable constraint on LF Wh raising by his account, the LF structure in (25b), which expresses the right scope relation, can in no way be yielded.<sup>10</sup>

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10. To put it more accurately, the unselective binding analysis predicts that the scope relation found in (23) would be something like (24b). Nishigauchi (1986, 1990) avoids this conclusion by saying that the wh expression and the island are not equal with regard to scope. The scope interpretation may also be explained by referring to indirect binding, as in Haik (1984). Needless to say, this system also makes a wrong prediction, since the scope relation expected from this system must be in repooto-dare order. Moreover, it should be noted that this scope relation cannot be derived via QR, either. All in all, under a movement ac-

In opposition to Nishigauchi's analysis, which utilizes movement of a wh phrase within an island, our analysis proposes a treatment which is dissociated from movement of a wh phrase in the case of pied piping, and suggests that a wh phrase embedded in a complex NP is not construed as a quantifier which undergoes a 'quantifier' rule. Instead, the present analysis views that the entire island is construed as a constituent, over which the quantificational domain of the wh word spreads by virtue of pied piping. In this analysis, since the whole island is seen as a single quantificational expression, whose value is indicated by the wh phrase, we can state that the value of the relative head reputo is identified through the identity of dare in the case of (23). Therefore, it is naturally expected that the value of reputo is understood as being contingent upon the assignment of values to dare, obtaining the desired reading on which reputo falls within the scope of dare.<sup>11</sup> Under our view, then, we can correctly predict the interpretation of the com-

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count of relative scope, this kind of scope relation must be derived via the extraction of dare from the relative clause, and this is of course in violation of Subjacency. Under the assumption we have been working with, then, it is impossible to account for the scope property of a sentence like (23) by virtue of quantifier rules. See note 14.

11. Our proposed analysis claims that a wh phrase located inside a complex NP (i.e. an island) does not have the status of a quantifier, and that the wh word merely has a value defining property of the complex NP, which serves as a wh expression by virtue of pied piping.

plex NP which contains a wh word within it.

In short, under our view, the kind of scope fact that is shown above receives a different treatment from the movement analysis, and in our analysis, the notion of syntactic scope is not utilized for explaining the scope relation found between the relative head and the wh word inside the complex NP. As things stand, the major strength of the present analysis lies in the fact that the theory being advanced here makes a correct prediction on the scope dependency, without requiring any ad hoc maneuvers (or any patching statements). In the next subsequent section, we will consider another piece of evidence that supports our alternative theory and present an argument also leading us away from Nishigauchi's analysis.

#### 5.2.2. Bound Variable Anaphora

In the preceding section, we presented a discussion concerning the scope of a wh phrase within an island, and we saw that our analysis, as well as Nishigauchi's analysis, is capable, in most cases, of offering an explanation of the scope behavior of such a wh phrase. As we have seen in the preceding discussion, however, our explanation of pied piping, as it stands, drastically differs from Nishigauchi's explanation with regard to the hypothesized LF structure of a pied piped constituent, and it has been shown that predict-



ions made by these analyses differ in a subtle way. The present section is also devoted to exploiting ways of confirming the adequacy of our alternative analysis which we have alluded to in the foregoing discussions. The main concern of this section is, then, whether there is any other positive evidence that lends empirical support to our proposed analysis.

Prior to entering into a detailed discussion, we should be very careful to note the differences between our proposed analysis and the analysis which Nishigauchi (1986, 1990) has proposed. First, reconsider the important difference that distinguishes our analysis from Nishigauchi's analysis:

- (26) a. [CP [NP WH<sub>j</sub> ..t<sub>j</sub> .. ]<sub>i</sub> [IP ... t<sub>i</sub> ... ] Q<sub>1,j</sub> ]<sub>1,j</sub> ...  
 b. [CP [NP ..WH .. ]<sub>i</sub> [IP ..... t<sub>i</sub> ..... ] Q<sub>i</sub> ]<sub>i</sub> ...

The crucial difference between the two analyses emerges when we look at what is governed by the Q element, which we assume to be a quantificational force assigner. A comparison of (26a) and (26b) shows that in our analysis, the Q element is postulated to govern only the island and the quantificational force is, then, assigned only to the island, but Nishigauchi (1986, 1990) argues that the Q element governs both the island and the wh phrase and the quantificational force is assigned to both of them. Both approaches share the assumption that the complex NP is assigned a quantificational force by

the Q element but the two analyses critically differ with respect to the grammatical status accorded to the wh phrase. While our analysis states that the wh phrase located inside the island is not vulnerable to the quantificational force assignment by the Q element, Nishigauchi (1986, 1990) argues that the wh phrase also receives a quantificational force from the Q element under government.

One particularly striking kind of evidence in support of our analysis can be adduced from the fact that a wh phrase embedded in a concessive clause may bind a zero pronoun outside of the clause which it resides in, as in (27):

- (27) [ Taroo-ga dare<sub>i</sub>-o ture-te-ki-te mo ] boku-wa e<sub>i</sub>  
 Taroo-NOM who-ACC bring Q I-TOP  $\emptyset$   
 awa-nai.  
 meet-not  
 'No matter who Taroo brings, I will not meet (him).'

In (27), the wh phrase dare may bind the zero pronoun in the clause outside of the c-command domain of dare.<sup>12</sup> Recall that the pronoun binding is usually possible with this type of wh phrase just in case the wh phrase c-commands the pronoun it coindexes with at LF. But in the case of (27), dare can bind the zero pronoun outside its c-command domain, nullifying the boundedness requirement. Since it is quite sound to assume, as argued earlier, that the wh phrase and

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 12. The c-command domain of dare here should be taken to mean a set of nodes which it c-commands at LF.

the Q element constitute a coherent unit (at LF), we can maintain the view that the wh phrase may extend its scope beyond the clause headed by the Q element by way of coindexing between the wh phrase and the Q element, as the following LF construal illustrates:

(28) [ [<sub>CP</sub> dare-o<sub>1</sub> [<sub>IP</sub> Taroo-ga t<sub>1</sub> ture-te-ki-te ] mo<sub>1</sub> ]<sub>1</sub>  
       boku-wa e<sub>1</sub> awa-nai ]

In the LF representation in (28), what assigns a quantificational force to dare is the Q element mo, which heads the concessive clause. In the construal where dare is coindexed with the Q element mo, it is thus naturally expected that the entire clause comes to bear the scope index of dare, and that the wh phrase dare, which resides in the concessive clause, can have scope over the portion of the matrix clause that the concessive clause c-commands by virtue of coindexing between dare and mo. In effect, the somewhat irksome fact that the zero pronoun can be anaphorically linked to its antecedent dare without a c-command relation between them (at LF) in a sentence like (27) can be deduced from the assumption that the wh phrase dare is construed with the Q element at the level of interpretation and that the whole concessive clause headed by the Q element c-commands the zero pronoun. This is a reasonable assumption in view of the fact that a wh phrase must be construed with the Q element under the structural

condition of government in order to receive a quantificational force from the Q element, which heads the concessive clause.

The analysis suggests that the position of a Q element that coindexes with a wh phrase is responsible for the scope of the wh phrase. Upon reflection, it turns out that a zero pronoun, in fact, can be understood as a bound variable in the scope of the antecedent only if the clause which coindexes with a wh phrase c-commands the zero pronoun, as the ungrammaticality of (29) shows:

- (29) \*[ Jiroo-ga [ dare<sub>1</sub>-ga kuru ka ] tazune-naku-te mo ]  
 Jiroo-NOM who-NOM come Q ask-not Q  
 itumo Taroo-wa e<sub>1</sub> ai-ta-gat-ta.  
 always Taroo-NOM  $\emptyset$  meet-to-wanted  
 'Even if Jiroo did not ask who would come, Taroo  
 always wanted to meet (him).'

In (29), the wh phrase dare is construed only with ka, which is the closest Q element which c-commands the wh phrase, and since the Q element mo cannot bind anything under this configuration, mo comes to carry the meaning of 'even if'. In this grammatical context, the intended bound variable interpretation of the zero pronoun is not available, because the clause which binds the wh phrase fails to c-command the zero pronoun. This shows that the scope of the wh phrase is indeed determined by the c-command domain of the clause with which the wh phrase is coindexed. (Note: The sentence may be

acceptable if it is used in a context in which some specific person is known to come and Taroo wants to meet him, but the crucial point to be noticed here is that this sentence does not permit an interpretation in which Taroo wants to meet everyone that will come.)

The construal of a *wh* phrase with mo is possible as long as mo serves as the closest binder no matter how deeply the *wh* phrase is embedded, and if this is the case, the *wh* phrase may bind the zero pronoun which is c-commanded by the clause of which it is a part, as we would expect, (even if the *wh* phrase is deeply embedded):

- (30) [ Taroo-ga [ dare<sub>1</sub>-o ture-te-kuru to ] it-te mo ]  
 Taroo-NOM who-ACC bring that say Q  
 Jiroo-wa itumo e<sub>1</sub> ai-ta-gat-ta.  
 Jiroo-TOP always  $\emptyset$  meet-wanted  
 'No matter who Taroo said that he was going to bring,  
 Jiroo always wanted to meet (him).'

Example (30) is fully acceptable and the zero pronoun can be interpreted as coreferential with dare, which is situated inside the subordinate clause of the concessive clause. If our analysis is correct, then, the sentence must have an LF structure like in (31):

- (31) [ [CP dare-O<sub>1</sub> [IP Taroo-ga [CP [IP t<sub>1</sub> ture-te-kuru  
 to ]] it-te ] mo<sub>1</sub> ]<sub>1</sub> Jiroo-wa itumo e<sub>1</sub> ai-ta-gat-ta ]

As the acceptability of the indicated interpretation illustrates, the sentence has to yield an LF structure in which the *wh* phrase is moved into the specifier position of the clause which *c*-commands the zero pronoun and coindexes with mo at the level of LF, in order for the zero pronoun to construe dare as its antecedent. Given these considerations, we can state that a zero pronoun can be understood as a bound variable of a *wh* phrase if the concessive clause which carries the quantificational force of the *wh* phrase *c*-commands the zero pronoun. Since this view is quite sound, as discussed in the preceding chapter, we will assume in the ensuing discussion that this is a valid generalization, without any more justification.

With the generalization now given, we can proceed to consider some examples where a *wh* phrase is embedded in a syntactic island. The tactic of appealing to zero pronouns serving as bound variables to check the construal of mo will bring a new insight into light. To see this, first consider the following:

- (32) [ [ syatyoo-ga dare-o yatou toyuu ] uwasa<sub>1</sub>-o  
 president-NOM who-ACC hire that rumor-ACC  
 kii-te mo ] Taroo-wa e<sub>1</sub> utagawa-nakat-ta.  
 hear Q Taroo-TOP  $\emptyset$  suspected-not  
 'For whatever *x,y*, *x* is a person, *y* is the rumor that  
 the president will hire *x*, if Taroo heard *y*, he did  
 not suspect (it).'

Example (32) has an interpretation on which the zero pronoun

is anaphoric to the entire complex NP [ syatyoo-ga dare-o yatou toyuu ] uwasa. This shows that the sentence is interpreted as having the zero pronoun within the scope of the complex NP, which is to be analyzed as a wh expression to be moved at LF. If this is correct, (32) has the following LF structure, where the entire complex NP is moved into the specifier position of the clause headed by mo:

(33) [ [CP [ syatyoo-ga dare-o yatou toyuu ] uwasa-o<sub>i</sub>  
 [IP t<sub>i</sub> kii-te ] mo<sub>i</sub> ]<sub>i</sub> Taroo-wa e<sub>i</sub> utagawa-nakat-ta ]

Since the scope of the complex NP should be expressed through the concessive clause headed by mo in order for the zero pronoun to be construed as a bound variable of the complex NP, the complex NP must be moved into the pre-IP position of the concessive clause and be coindexed with mo. If we posit an LF structure like (33) for (32), we can provide a ready explication for the fact that the zero pronoun is interpretable as a bound variable bound by the complex NP.

Note, however, that dare inside the complex NP cannot be interpreted as serving as the antecedent of a zero pronoun outside the concessive clause. Consider the following sentence, which minimally differs from (32) with the choice of the matrix verb. (Note that unlike (32), the non-overt pronoun in (34) is intended as anaphoric to dare.):

- (34) \*[ [ syatyoo-ga dare<sub>1</sub>-o yatou toyuu ] uwasa-o  
 president-NOM who-ACC hire that rumor-ACC  
 kii-te mo ] Taroo-wa e<sub>1</sub> ai-ni it-ta.  
 hear Q Taroo-TOP Ø meet-to go  
 'For whatever x,y, x is a person, y is the rumor that  
 the president will hire x, if Taroo heard y, then he  
 went out to meet (him).'

The ill-formedness of the sentence with the intended interpretation indicates that the sentence does not involve any LF rule permitting the quantifier binding in such a way that the zero pronoun falls under the scope of dare.<sup>13</sup> Since the exportation rule of dare within a complex NP is performed in order to ensure the coindexation between dare and mo under Nishigauchi's analysis, the wh phrase is expected to behave exactly like the entire complex NP in his analysis. If the

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 13. To some degree, a sentence like (34), which has a wh phrase within a complex NP, improves if the wh phrase occurs in the NP-initial position, as in (i):

- (i) ??/?\*[ [ dare<sub>1</sub>-ga yatow-are-ru toyuu ] uwasa-o  
 who-NOM is hired that rumor-ACC  
 kii-te mo ] Taroo-wa e<sub>1</sub> ai-ni it-ta.  
 hear Q Taroo-TOP Ø meet-to went  
 'For whatever x,y, x is a person, y is the rumor that  
 x will be hired, if Taroo heard y, then he went out  
 to meet (him).'

For some reason, the sentence in (i) does not sound as bad as (34). At present, we do not have any insightful explanation for this, but one possibility is that the NP initial wh phrase is prone to be interpreted as lying outside the complex NP, as in (ii):

- (ii) [<sub>CP</sub> dare-ga [<sub>NP</sub> [ yatow-are-ru toyuu ] uwasa-o ]  
 kii-te mo ] .....

The nature of this restriction, however, is not clear, and we have to leave this question open for further research.



wh expression were actually moved inside the complex NP and got adjoined within the NP and if the wh phrase is bound by the Q element in the same way as the entire complex NP, we would expect that the zero pronominal should be interpretable within the scope of dare just as in the case of the complex NP in (32). As indicated above, however, this is obviously not the case. The fact that the zero pronoun is taken only within the scope of the complex NP, but not within the scope of dare, immediately suggests that the coindexation with mo is, in effect, confined to the complex NP and the wh phrase dare is not governed by the Q element mo.<sup>14</sup> Since the be-

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 14. Nishigauchi (1986, 1990) presents the following sentence to argue for his analysis which renders internal Wh movement within an island mandatory:

- (i) ??[ nan-ka-koku                    kara ki-ta ] daihyoo-ga  
           how-many-countries from came        representatives  
           atumari-masi-ta ka?  
           gathered                                Q  
           'Representatives who came from how many countries  
           gathered?'

Although the sentence appears to be grammatical, it has a bizarre interpretation on which the identity of representatives is sought after in terms of the number of countries they represent. In this interpretation, one person may be a representative of a number of countries, but this is pragmatically unrealistic. This scope interpretation is derived from the fact that the scope of the complex NP is wider than that of nan-ka-koku, and Nishigauchi (1986, 1990) states that (i) has the following LF structure:

- (ii) [ [ how many countries ]<sub>x</sub> [ [ from x came ] reps ] ]<sub>y</sub> [ y gathered ]

Nishigauchi (1986, 1990) claims that the LF structure is what is expected from his analysis of pied piping, which has the assumption that a wh word undergoes Wh movement inside. Notice, however, that this analysis is not forced, for the wh phrase nan-ka-koku is also quantificational in the same way

havior of the two expressions differ with regard to zero-pronoun binding, we can assume that only the complex NP, but not dare, is governed by mo and that the coindexation of dare with mo does not take place at LF in this case. If this is correct, we can state that the zero pronoun cannot get its reference from dare, for the concessive clause c-commanding the zero pronoun fails to carry the scope index of dare.

Although we are dealing here with the question of whether a wh phrase within a complex NP is governed by a Q element or not, it is interesting to see at this point whether a wh phrase can be licensed by a Q morpheme through unselective binding (under our formulation). As another set of observation, let us consider sentences in which there is a multiple occurrence of wh phrases:

- (35) a. [ dare-ga nani<sub>i</sub>-o tukut-te mo ] Taroo-wa kanarazu  
 who-NOM what-ACC make Q Taroo-TOP always  
 sensei-ni e<sub>i</sub> mise-ni-yuki-masu.  
 teacher-DAT  $\emptyset$  show-to-go  
 'No matter who makes what, Taroo always goes to show  
 (it) to his teacher.'

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 as dare-ka. To be precise, then, the fact is not at variance with our analysis, since we do not dispel the possibility of the 'quantificational' wh phrase undergoing QR inside the island. In fact, if it is assumed that the wh phrase nan-ka-koku is susceptible to QR, which moves a quantified expression within the clause-boundary of a finite clause, we can explicate the fact that nan-ka-koku has narrower scope than the entire complex NP because the expected landing site for that wh phrase lies within the complex NP. The crucial point is that a wh phrase never comes to get governed by a Q element if it is embedded in a syntactic island, and that being susceptible to QR is quite permissible in the system developed here.

- b. [ dare<sub>1</sub>-ga nani-o tukut-te mo ] Taroo-wa itumo  
 who-NOM what-ACC make Q Taroo-TOP always  
 issyookenmei e<sub>1</sub> home-masu.  
 earnestly Ø praise  
 'No matter who makes what, Taroo always praises  
 (him) earnestly.'

As the well-formedness of these sentences indicates, a zero pronoun can be bound by either dare or nani, depending on the environment to which the zero pronoun adapts. Furthermore, for our present purposes, it is worthwhile to note that their interpretive dependence is, essentially, shared by a multiple wh question like (36):

- (36) Taroo-wa [ dare-ga nani-o tukut-ta ka ] sit-te-iru.  
 Taroo-TOP who-NOM what-ACC made Q know  
 'Taroo knows who made what.'

In (36), the scope behavior of the two wh phrases is quite parallel to that in (35), in the sense that these wh phrases are mandatorily interpreted as having the same scope. Although we did not discuss the precise nature of multiple wh questions in Japanese, it is quite obvious even at an observational level that they share fundamental properties with English multiple wh questions: A multiple wh question in Japanese is, just as with a multiple wh question in English, understood as asking for a list of pairing, and wh phrases are considered as taking the same scope. Given the discussion of unselective binding, which has been provided in Chap-

ter 2, we can reasonably assume that the Japanese double wh question in (36) has an LF structure, as in (37), which is analogous to its English counterpart:<sup>15</sup>

(37) [ Taroo-wa [CP dare-ga<sub>1(j)</sub> [IP t<sub>1</sub> nani<sub>(j)</sub>-o tukut-ta ]  
ka<sub>1(j)</sub> ] sit-te-iru ]

The same is true of the interpretation of scope between wh phrases in the concessive clauses in (35). Just as is the case with a multiple wh question, a concessive clause which has a plural number of wh phrases within it has the interpretation on which the wh phrases are construed with each other, acquiring the same scope domain. Then we can immediately see that the LF construal of concessive clauses found in (35) should be treated on a par with (37), as in (38):

(38) [ [CP dare-ga<sub>1(j)</sub> [IP t<sub>1</sub> nani<sub>(j)</sub>-o tukut-te ]  
mo<sub>1(j)</sub> ]<sub>1(j)</sub> .... e ..... ]

If we accept the view that it is necessary to postulate an LF construal like (38) to explain the scope properties of the

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15. In our analysis, only one wh phrase is assumed to undergo Wh movement. Since it is immaterial for the purpose of the present discussion which wh phrase is affected by LF Wh fronting, we simply assume here, without any justification, that the leftmost wh phrase is preposed to the clause-boundary of the sentence via Wh raising at the LF level.

concessive clauses in (35), then we must ask why a zero pronoun can be bound by either dare or nani. The obvious reason is that these wh phrases are coindexed with the Q element mo, either by direct coindexing (under government) or coindexing through unselective binding.<sup>16</sup>

Note that as far as the interpretive procedures go, the distinction that our analysis makes between direct coindexation and coindexation through unselective binding vanishes with regard to the variable-binding. This is precisely because the scope of a wh phrase does not care much about the way it is encoded. In (38), for instance, dare 'who' is assumed to move to the clause initial position and coindexed directly with mo under government. The wh word nani, on the other hand, remains in place throughout the derivation, and it is instead unselectively bound by the operator dare in our analysis. This means that the wh phrase nani cannot be directly coindexed by mo, but notice that since the operator dare unselectively binds nani in this configuration. If so, it can be assumed that the scope index of nani is carried over to mo with the mediation of the unselective binder dare.

In effect, since the quantificational force is, essentially, assigned to nani by mo (by way of the unselective binder dare in our analysis), it appears fair to assume that

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16. The term 'direct coindexing' here is intended to refer to the indexing relation between a Q element and a moved wh phrase under government.

nani can be indirectly licensed by mo through unselective binding. If this much is correct, it is not surprising that the scope of nani, which is determined by the position of dare (and ultimately by the position of mo) at the LF level, can exceed beyond the clause it inhabits, and that nani is capable of binding a zero pronoun which is c-commanded by the clause in which it resides, just like the scope of dare.

Furthermore, the fact that the scope properties of the two types of wh phrases cluster together can be firmly ascertained by the English example, in which Wh movement occurs in syntax:

(39) No matter who<sub>1</sub> writes what<sub>3</sub>, I recommend him<sub>1</sub>  
to send it<sub>3</sub> to some journal.

In (39), it must be recognized that the wh-in-situ can have the wide matrix scope and the bound variable interpretation of the pronoun it is available. Here, the coindexing possibility of the non-moved wh phrase what extends beyond the clause in which it is situated, and the fact can be accounted for by positing the following LF construal for (39), on the assumption that no matter serves as a quantificational force assigner:

(40) [ [ADVP no matter<sub>1(3)}</sub> [CP who<sub>1(3)}</sub> [IP t<sub>1</sub> writes  
what<sub>(3)}</sub> ] ] ]<sub>1(3)}</sub>, I recommend him<sub>1</sub> to send it<sub>(3)}</sub>

to some journal ]

Since the wh-in-situ what can have wide scope over the concessive clause which carries the scope index of what in virtue of unselective binding, coindexing with the indicated pronoun is possible. The analysis further predicts that the scope of a wh phrase cannot exceed beyond the clause which it inhabits if the wh phrase is not licensed by unselective binding. Now, compare (41a) with (41b):

- (41) a. \*No matter who tells me which paper<sub>1</sub> to read,  
I will not read it<sub>1</sub>.
- b. No matter who tells me to read which paper<sub>1</sub>,  
I will not read it<sub>1</sub>.

The sentence in (41b) is just like that in (41a), the only difference being that a wh-in-situ, in place of a moved wh phrase, is located in the mostly embedded clause. Notice that coindexing between which paper and the zero pronoun can occur in (41b) but not in (41a). The asymmetry between these sentences in their acceptability with the intended interpretation indicates that the coindexing possibility with a bound pronoun can indeed be controlled by unselective binding, which is allowed to operate only on wh-in-situ, as shown by the LF construals in (42):<sup>17</sup>

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17. The fact gives us further credence to our previous

- (42) a. \* $[ [_{\text{ADVP}} \text{no matter}_1 [_{\text{CP}} \text{who}_1 [_{\text{IP}} t_1 \text{ tells me which paper}_j \text{ to read } t_j ] ] ]_1 \text{ I will not read it}_j ]$
- b.  $[ [_{\text{ADVP}} \text{no matter}_{1(j)} [_{\text{CP}} \text{who}_{1(j)} [_{\text{IP}} t_1 \text{ tells me to read which paper}_{(j)} ] ]_{1(j)} \text{ I will not read it}_{(j)} ]$

The crucial difference between the LF representations is that while the concessive clause receives the scope index of which paper in (42b) by virtue of unselective binding, the concessive clause in (42a) does not. As the LF construals in (42) indicates, variable binding is made possible with a wh phrase when the moved wh phrase located in the specifier position of the concessive clause can license the wh phrase in question by virtue of unselective binding; otherwise it would be impossible. Thus, the intended variable reading is available in the case of (42b), but not in (42a). Again, the crucial point is that, as far as the scope of a wh phrase is concerned, there is no conceivable difference between direct coindexation and coindexing through unselective binding.

Now, recall the point of controversy concerning the LF

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 claim that the scope of a moved wh phrase is restricted to the clause in which it resides at S-structure in a multiple wh question like (i):

- (i) Who remembers where we bought what?

In (i), the moved wh phrase where, unlike the non-moved wh phrase what cannot be construed with the matrix wh phrase who. The fact can be readily captured if it is assumed that where never serves as a bound variable.



structure of a pied piped constituent, which has a wh phrase inside a syntactic island. Nishigauchi (1986, 1990) treats both the complex NP and the wh phrase alike, but our alternative model presents a much simpler theory in which the island is reanalyzed as a wh expression. As we pointed out previously, a wh phrase embedded inside an island cannot bind a lexical variable (a zero pronoun) outside the clause within which it resides, even if it is contained within a concessive clause, as is illustrated in (43):

- (43) \*[ [ dare<sub>i</sub>-ga kai-ta ] hon-o yon-de mo ] Taroo-wa  
           who-NOM wrote book-ACC read Q Taroo-TOP  
           itumo e<sub>i</sub> ai-ta-gari-masu.  
           always  $\emptyset$  meet-want  
           'For whatever x,y, x is a person, y is a book x wrote,  
           if Taroo reads y, he always wants to meet (him).'

When confronted with the behavior of a wh phrase in a syntactic island, we are necessarily led to conclude that the system which treats a complex NP and a wh phrase embedded within it fully alike with respect to government by a Q element cannot adequately deal with the asymmetry between the two. The fact that the indexed pronoun cannot be bound by the coindexed wh phrase suggests that the wh phrase is not licensed by the Q element in the concessive clause either with direct coindexation or with coindexation by way of unselective binding.

This is expected if it is assumed that the entire island

is treated as a single 'large' wh expression containing a wh word (as a consequence of 'reanalysis') in a case where pied piping takes place. All things considered, a natural proposal would be that a wh phrase is not governed by a Q element at all when embedded in a syntactic island. If this is correct, in (43), for example, the familiar rule of pied piping must move the whole island into SPEC of CP (without internal Wh movement), and yield an LF structure like (44):

(44) \* $[ [_{CP} [ \text{dare}_j\text{-ga kai-ta} ] \text{hon-O}_i [_{IP} t_i \text{yon-de} ] \text{mo}_i ]_i$   
 Taroo-wa itumo  $e_j$  ai-ta-gari-masu ]

For a zero pronoun to be interpreted as a bound variable of a wh phrase, it must be c-commanded by the concessive clause which receives the scope index of the wh phrase either by direct coindexing or by unselective binding. However, in an LF structure like (44), even though the complex NP is moved into the specifier position of the concessive clause headed by mo, the wh word dare is still too far away from the Q particle for coindexing to take place. In this grammatical environment, the scope index of dare cannot be codified into the Q element, and the zero pronoun cannot be construed as within the scope of the wh phrase dare because nothing carrying the scope index of dare c-commands the zero pronoun. Hence, the zero pronominal can in no way be interpreted as a bound variable whose antecedent is dare.

It must be stressed here that since a wh phrase is deeply embedded in a concessive clause, the kind of variable-binding observed above should be made possible only when the grammatical operation of Wh movement brings out the effect that the scope index of the wh phrase is transmitted to the Q element. In conjunction with this point, it should further be noted that the same point can be made in cases where mo pied pipes an island, serving as a mere Q-domain marker. As is expected from our analysis, in cases in which mo pied pipes an island, a wh phrase located within a syntactic island never contributes to the variable-binding of a zero pronoun located outside the island, as indicated below:

- (45) \*[ dare<sub>i</sub>-ga kai-ta ] tooan-yoosi-mo [ Taroo-ga e<sub>i</sub>  
 who-NOM wrote answer-sheet-Q Taroo-NOM  $\emptyset$   
 au mae-ni ] sute-rare-ta.  
 meet before was thrown away  
 'For every x,y, x is a person, y is an answer sheet on  
 which x wrote answers, x was thrown away before Taroo  
 met (him).'

The unavailability of the indicated antecedent-variable linking can be explained if we assume that no movement inside the complex NP occurs to the effect that dare comes to be governed by mo. In effect, in the case of (45), mo serves as a Q-domain indicator, rather than a scope marker (in our terminology), which merely picks out a pied piped constituent. In this grammatical context, the Q element mo is thought of as assigning its quantificational force only to

the entire island (under government), and therefore, a wh phrase located in an island is unable to bind a zero pronoun, with a failure of satisfying the structural requirement of bound anaphora.

Moreover, in cases like (45), where mo attaches to the island, our analysis predicts that the entire island is permitted to function as the antecedent of the zero pronoun, since mo is assumed to govern the island in this case. As expected, just as a complex NP containing a wh phrase in it can be construed as the antecedent of a zero pronoun in a concessive clause, so a null pronoun can be anaphoric to a complex NP which is pied piped by mo, provided that the entire complex NP c-commands the zero pronominal, as in (46):

- (46) [ dare-ga kai-ta ] tooan-yoosi<sub>1</sub>-mo [ Taroo-ga e<sub>1</sub>  
 who-NOM wrote answer sheet-Q Taroo-NOM  $\emptyset$   
 yon-da ato-de ] sute-rare-ta.  
 read after was thrown away  
 'For every x,y, x is a person, y is an answer sheet on  
 which x wrote answers, y was thrown away after Taroo  
 read (it).'

As (46) further indicates, variable-binding is possible if the constituent which is pied piped by mo c-commands the zero pronoun. For that matter, it is important to recognize that only the complex NP which undergoes pied piping by mo is sensitive to the variable-binding at issue. In fact, the example in (46), along with (45), shows us what may count as the antecedent of a null pronoun which serves as a bound

variable when pied piping occurs, and the contrast between (45) and (46) indicate, in particular, that only the entire pied piped island, but not a wh phrase on the island, is permitted to work as the antecedent of a bound variable.

With this problem out of the way, it emerges, upon reflection, that a wh phrase inside an island never contributes to the binding of a non-overt pronoun (a lexical variable) outside the concessive clause in which the wh phrase resides. It is quite obvious from the discussion above that a wh phrase may bind a bound variable only if it is not embedded in a syntactic island, and if a wh phrase is located inside it, the Q element mo binds only the island, as illuminated below:

- (47) a. [ [CP WH<sub>1</sub> [IP ...t<sub>1</sub> ... ] mo<sub>1</sub> ]<sub>1</sub> ... e<sub>1</sub> ... ]  
 b. [ [CP [ ...WH ... ]<sub>1</sub> [IP ...t<sub>1</sub> ... ] mo<sub>1</sub> ]<sub>1</sub> ...  
 e<sub>1</sub> ... ]

The important point I would like to emphasize here is that the distribution of the zero pronominal as a bound variable is clearly more restricted than Nishigauchi's analysis predicts, and the observed pattern of a zero pronoun can be accounted for only if we assume that a wh phrase inside an island is not governed by a Q element at all. The facts are in keeping with our proposed analysis which identifies the island as a wh expression that is raised by Wh fronting,

without reference to Wh movement inside.

The discussion above clearly shows that any theory which does not differentiate between an island and a wh phrase located inside it falls short of accounting for the grammaticality or ungrammaticality of the empty-pronoun binding. We can conclude from this that to require a wh phrase to be governed by a Q element (at LF) even when it is embedded in a syntactic island is merely an artifact of an incorrect analysis. In this respect, our analysis proves to be highly favored, all things being equal, over the other existing approaches (including Nishigauchi's), since our analysis can correctly capture the facts concerning concessive clauses in Japanese.

### 5.3. Summary

In this chapter, we have concentrated on providing an answer to the question of whether or not a wh phrase that appears within an island gets governed by a Q element at LF, by making crucial use of data from Japanese concessive clauses. As we saw above, certain facts pertaining to scope relations and variable-binding clearly point toward the conclusion that a wh phrase is not affected by Wh raising at all when pied piping occurs, and that the wh phrase is in no way governed by a Q element throughout derivations. If our analysis is correct, only the island containing the wh phrase within it,

but not the wh word by itself, is construed as a quantified expression that undergoes Wh movement at the LF level. The conclusion drawn from the observations further supports our theory of pied piping in which we define the notion of pie piping in terms of a Q-domain marker.

## CHAPTER 6

### SCRAMBLING, BOUND ANAPHORA AND LF RECONSTRUCTION

#### 6.1. On Certain Differences Between Zero and 'Sore'

In 5.2.2, we have presented an analysis of pied piping that draws on the distribution of empty pronouns. Our central claim has been that the distribution of zero pronouns as bound variables is strictly defined in structural terms. The peculiar behavior of empty pronouns shows an interesting confirmation of the analysis of pied piping which we are pursuing. At the outset, it should be mentioned that one piece of evidence for our argument came from sentences like (1):

- (1) a. [ [ dare-ga kai-ta ] ronbun<sub>1</sub>-o yon-de mo ] Masao-wa  
          who-NOM wrote       paper-ACC read   Q     Masao-TOP  
          kanarazu e<sub>1</sub> hihan-si-ta.  
          always    ∅   criticized  
          'For whatever x,y, x is a person, y is a paper x  
          wrote, if Masao read y, he always criticized (it).'
- b. \*[ [ dare<sub>1</sub>-ga kai-ta ] ronbun-o yon-de mo ]  
          who-NOM wrote       paper-ACC read   Q  
          Masao-wa hanarazu e<sub>1</sub> ai-ni it-ta.  
          Masao-TOP always   ∅   meet   went  
          'For whatever x,y, x is a person, y is a paper x  
          wrote, if Masao read y, he always went out to meet  
          (him).'

In (1a), the empty pronoun can be evaluated as having [dare-



ga kai-ta ] ronbun as its antecedent, because the concessive clause that comprises the complex NP within it c-commands the zero pronoun. In our analysis, since the S-structure representation does not have source information for the intended interpretation, the availability of the bound variable interpretation in (1a) must be ascribed to the LF construal that arises after the application of LF Wh movement, as shown by (2):

(2) [ [CP [ dare<sub>j</sub>-ga kai-ta ] ronbun-o<sub>i</sub> [IP t<sub>i</sub> yon-de ]  
mo<sub>i</sub> ]<sub>i</sub> .... e<sub>i</sub> ..... ]

In the case of (1b), in contrast, the desired interpretation for the zero pronoun does not obtain, notwithstanding the fact that dare is contained within the concessive clause. Under our view, the coindexation between dare and the zero pronoun is forbidden, precisely because nothing that contains the scope index of dare c-commands the zero pronoun, as illustrated by the LF configuration in (2). It must be stressed that the key to integrating the nature of bound variables found in the concessive clauses in (1) into our theory is the rule of LF Wh fronting, which we assume to function as the primary trigger for the bound variable interpretation.

While we are claiming that zero pronominals function as bound variables, there is another class of pronominals, as

was observed by Nishigauchi (1986, 1990), which apparently behave like bound variables in some grammatical context. This class of pronominals includes an overt pronoun like sore 'it'. Consider the following sentences:

- (3) a. [ dono-hon<sub>1</sub>-o kat-te mo ] Taroo-wa kanarazu e<sub>1</sub>  
 which-book-ACC buy Q Taroo-TOP always  $\emptyset$   
 yomi-masu.  
 read  
 'No matter which book he buys, Taroo will always read (it).'
- b. [ dono-hon<sub>1</sub>-o kat-te mo ] Taroo-wa kanarazu  
 which-book-ACC buy Q Taroo-TOP always  
 sore<sub>1</sub>-o yomi-masu.  
 it-ACC read  
 'No matter which book he buys, Taroo will always read it.'

Both sentences in (3) appear to have an interpretation in which dono-hon inside a concessive clause binds the pronoun in the matrix clause, irrespective of whether the pronoun is empty or overt. At first sight, this fact might be taken as an indication that the overt pronoun sore, just like a zero pronoun, acts like a bound variable, getting its reference from dono-hon.

Although the overt pronoun sore bears a similarity to a zero pronoun in regard to its semantic properties in cases like (3), it appears that sentences with sore generally admit a wider range of coindexing possibilities than what is allowed for those with a zero pronoun which we claim to serve as a bound variable. The following examples illustrate the

point:

- (4) a. ?\*[ [ dono-ronbun<sub>1</sub>-o kai-ta ] hito-ga ki-te mo ]  
          which-paper-ACC wrote person-NOM come Q  
Taroo-wa [ e<sub>1</sub> LI-ni okuru ] koto-o susume-ta.  
Taroo-TOP ∅ LI-DAT send that-ACC recommended  
'For whichever x, y, x is a paper, y is a person  
that wrote x, if y came, Taroo recommended him to  
send (it) to LI.'
- b. [ [ dono-ronbun<sub>1</sub>-o kai-ta ] hito-ga ki-te mo ]  
          which-paper-ACC wrote person-NOM come Q  
Taroo-wa [ sore<sub>1</sub>-o LI-ni okuru ] koto-o susume-ta.  
Taroo-TOP it-ACC LI-DAT send that-ACC recommended  
'For whichever x, y, x is a paper, y is a person  
that wrote x, if y came, Taroo recommended to send  
it to LI.'

As seen in (4), the overt pronoun sore, unlike the zero pronominal, can be anaphorically connected with dono-ronbun even if it is deeply embedded in a syntactic island. If what Nishigauchi (1986, 1990) claims for the non-null pronoun sore were correct, viz. the claim that sore serves as a bound variable, we would run into an immediate problem: Under our view, the structure crucial for a bound variable interpretation is always furnished after coindexing between a wh phrase and mo at the LF level. In sentences like (4), since the scope index of the wh phrase dono-ronbun cannot be inherited by the Q affix mo (by hypothesis), nothing that contains the scope index of dono-ronbun does not c-command the overt pronoun, as in (5), but still, coindexing appears to be possible in the case of (4b):

(5) [ [CP [ dono-ronbun<sub>3</sub>-o kai-ta ] hito-ga<sub>1</sub> [IP t<sub>1</sub>  
ki-te ] mo<sub>1</sub> ]<sub>1</sub> ... sore<sub>3</sub> .... ]

The question to be addressed here is whether sore needs to have an LF structure in which sore is c-commanded by the concessive clause carrying the scope index of dono-ronbun or sore is usable, without requiring such an LF structure, so as to behave like a bound variable. If the former is the case, we will be forced to claim, for example, that (4b) should be analyzed as involving dual structural descriptions, namely, the logical forms in (6a) and (6b):<sup>1</sup>

(6) a. [ [CP [ dono-ronbun-o kai-ta ] hito-ga<sub>1</sub> [IP t<sub>1</sub>  
ki-te ] mo<sub>1</sub> ]<sub>1</sub> ... sore<sub>1</sub> .... ]

b. [ [CP dono-ronbun-o<sub>3</sub> [IP [ t<sub>3</sub> kai-ta ] hito-ga  
ki-te ] mo<sub>3</sub> ]<sub>3</sub> ... sore<sub>3</sub> .... ]

If it is the case that sore is allowed to function as a bound variable, we are also forced to state that the behavior of sore brings out the effect of voiding the well-established island constraints, obtaining an LF construal like (6b) in the LF component, but this is evidently an undesirable conclusion in view of the fact that island constraints are in-

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1. Actually, it is possible to claim, as in Nishigauchi (1986, 1990), that only the position of mo is relevant for a bound variable interpretation in the case of sore. In our analysis, this is equivalent to saying that the reference of sore is fixed prior to the emergence of the relevant LF structure and that sore is not a bound variable at all.

violable even in LF.<sup>2</sup> In the light of these considerations, it appears imperative to conclude that the possibility of coindexing of dono-ronbun with sore in (4b), which stands in contrast to (4a), indicates that the 'strict' c-command relation in LF is not really required for the non-null pronoun sore to behave as if it is a bound variable. In order to show that this line of reasoning is valid, obviously, we need to prove that the distribution of overt pronouns like sore is indeed determined without making reference to LF configurations.<sup>3</sup>

The fact that a wh phrase can be embedded within a complex NP in a concessive without affecting grammaticality, in fact, appears to suggest that the relevant condition for coindexation with sore cannot be formulated on the basis of a 'c-command' relation at the LF level. The most plausible candidate for explaining the behavior of sore, then, would be the hypothesis that the reference of sore is determined relying on pragmatic information. As we will discuss below, this

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2. Note that in the current system, no principles would preclude the possibility that a single sentence has dual LF representations. Thus it is possible to claim that the reference of the zero pronoun and sore is determined in reference to distinct LF configurations if we discard the claim that Subjacency constrains movement in the LF component.

3. If we accept the view that (5) is the only configuration derivable from the surface structure in (4b), the distribution of sore cannot be explained if sore is treated as a bound variable, which is required to stand within the scope of an element carrying the scope index of a wh word.

appears to be a reasonable hypothesis. To support this belief, we will first offer the following indirect suggestive evidence:

- (7) ?(?) [ [ nani<sub>1</sub>-o tukut-ta ] hito-ga ki-te mo ]  
                   what-ACC made                  person-NOM come Q  
 Taroo-wa [ sore<sub>1</sub>-o tenzi-suru ] koto-o susume-ta.  
 Taroo-TOP it-ACC exhibit                  that-ACC recommended  
 'For whichever, x,y, x is a thing, y is a person who  
 made x, if y came, Taroo recommended him to put it on  
 exhibition.'

The example in (7) is a wh interrogation in which nani 'what' occurs within the complex NP. The awkwardness of the sentence, compared with the acceptability of (4b), suggests that the anaphoric reference of sore is not determined by the grammar per se. The difference between these examples seems to be derived from the fact that while  dono 'which' is typically used in the environment where a certain choice of the value of the wh phrase is clearly identifiable in pragmatical terms, it is not easier to accept the use of nani in such a context. When sore is used, it is hard for sore to be coreferential with nani, as indicated by the awkwardness of (7). If sore really serves as a bound variable, as claimed by Nishigauchi (1986, 1990), it is expected that kinds of wh phrases are not of relevant for bound variable interpretations, but apparently this is not the case with sore. Given this fact, it is quite probable that the pronoun sore does not serve as a bound variable and that the anaphoric

reference of sore is not grammatically, but somehow pragmatically determined.

The difference in distribution does not necessarily lead to the position that advocates the line of reasoning pursued here, but if we turn our attention to LF reconstruction effects found in the case of scrambling, we can obtain some evidence in favor of our view. As a way of firmly establishing the adequacy of our view, we will then take a close look at LF reconstruction effects in concessive clauses involving scrambling in the subsequent section, and argue that the distribution of overt pronouns like sore is determined at S-structure configurations, so that they do not fall into the category of syntactic variables.<sup>4</sup> The next section shows that inspection of the data concerning LF reconstruction provides us with a piece of interesting evidence that lends empirical support to our view.

## 6.2. LF Reconstruction and Bound Anaphora

An earlier description of variable-binding involving a concessive clause (cf. Chapter 5) states that a wh phrase located inside a concessive clause is allowed to have access to a zero pronoun outside the clause, so long as the concessive

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4. In the case of Japanese, the relevant quantificational structure is always furnished in the LF component, and the distribution of bound variables should be based on LF configurations.

clause holding the scope index of the wh phrase c-commands the empty pronoun. The empirical coverage of the statement can be seen by the following representative examples:

- (8) a. [ dare<sub>1</sub>-ga ki-te mo ] Taroo-wa [ syatyoo-ga  
 who-NOM come Q Taroo-TOP president-NOM  
 yorokon-de-iru ] koto-o e<sub>1</sub> tuge-ta.  
 be pleased that-ACC Ø told  
 'No matter who comes, Taroo told (him) that the  
 president was pleased.'
- b. \*Taroo-wa [ syatyoo-ga [ dare<sub>1</sub>-ga ki-te mo ]  
 Taroo-TOP president-NOM who-NOM come Q  
 yorokon-de-iru ] koto-o e<sub>1</sub> tuge-ta.  
 be pleased that-ACC Ø told  
 'Taroo told (him) that no matter who comes, the  
 president will be pleased.'

Notice that the concessive clauses in question differ in the scope of modification. In (8a), the concessive clause is held to modify the main clause, taking both main and embedded clauses within its scope, while (8b) modifies only the embedded clause, leaving the main clause out of scope. Thus, the sentence in (8a) can be understood to mean that Taroo told everyone that the president is satisfied, with the understanding that dare serves as the antecedent of the zero pronoun. In contradistinction to this, the zero pronoun cannot be linked to dare in the case of (8b), and Taroo's telling must be directed to someone else.

The significance of the bound variable anaphora found in a concessive clause illustrated above resides in the fact that the concessive clause allows part of it to hold an



anaphoric relationship with a zero pronoun if the empty pronoun stands within the c-command domain of the concessive clause. There is, however, a slight complication in analysis in that we find some cases where this type of generalization does not straightforwardly carry over. To see the point, consider the following:

(9) a. [ donna-sinamono<sub>1</sub>-ga oku-rare-te-ki-te mo ] Taroo-wa  
 what article-NOM be sent Q Taroo-TOP  
 Hanako-ni [ e<sub>1</sub> okuri-kaesu ] koto-o meizi-ta.  
 Hanako-DAT Ø send back that-ACC ordered  
 'No matter what article was sent, Taroo gave an order to Hanako to send (it) back.'

b. ?[ e<sub>1</sub> okuri-kaesu ] koto-o<sub>j</sub>, [ donna-sinamono<sub>1</sub>-ga  
 Ø send back that-ACC what article-NOM  
 oku-rare-te-ki-te mo ] Taroo-wa Hanako-ni t<sub>j</sub>  
 be sent Q Taroo-TOP Hanako-DAT  
 meizi-ta.  
 ordered  
 'To send (it) back, no matter what article was sent, Taroo gave an order to Hanako.'

The structural difference between these examples solely lies in the fact the latter is derived from the former via the scrambling of the embedded clause to the sentence-initial position. The scrambled version of the sentence in (9), though its acceptability is somewhat degraded, appears to have a bound variable interpretation for the zero pronoun, just as is the case with the non-scrambled sentence. This fact indicates that the c-command relation at the surface level is not immediately relevant for the bound variable anaphora.

One notable property of the scrambled sentence in (9b) is that dare, just as is the case with (9a), may antecede the zero pronoun, even though the zero pronoun is not under the c-command domain of the concessive clause containing dare at the S-structure level. Evidently, the availability of the intended interpretation for the zero pronoun in this case must be traced back to the presence of a trace created by scrambling (at S-structure), which is c-commanded by the concessive clause. If this is correct, it is naturally expected that if the concessive clause containing a wh phrase fails to c-command a trace of a constituent including a zero pronoun left behind by scrambling, then the zero pronoun cannot be interpreted as a bound variable. This expectation is correct, and the following examples verify the point:

- (10) a. \*Taroo-wa [ Mary-ga [ donna-sinamono<sub>1</sub>-ga todoke-  
 Taroo-NOM Mary-NOM what-article-NOM be sent  
 rare-te mo ] yorokoba-nai ] koto-o [ e<sub>1</sub> mot-te-  
 Q be pleased-not that-ACC ∅ brought  
 ki-ta ] hito-ni hanasi-ta.  
 person-DAT told  
 'Taroo told the person who brought (it) that no  
 matter what article was sent, Mary was not pleased.'
- b. \*[ e<sub>1</sub> mot-te-ki-ta ] hito-ni<sub>j</sub>, Taroo-wa [ Mary-ga  
 ∅ brought person-DAT Taroo-TOP Mary-NOM  
 [ donna-sinamono<sub>1</sub>-ga todoke-rare-te mo ] yorokoba-  
 what article-NOM be sent Q be pleased-  
 nai ] koto-o t<sub>j</sub> hanasi-ta.  
 not that-ACC told  
 'To the person who brought (it), Taroo told that no  
 matter what article was sent, Mary was not pleased.'

In (10b), the preposed complex NP is scrambled from the posi-

tion selected by the verb hanasi-ta. Since the primary scope of the concessive clause is the embedded clause, and since the complex NP which comprises a zero pronoun within it lies in the matrix clause, which is out of the scope of the concessive clause, the intended bound variable is unavailable in both sentences. The crucial point is that the position of a zero pronoun at S-structure is not a diagnostic for determining the possibility of bound variable anaphora and that the bound variable interpretation is possible if the constituent containing a zero pronoun is scrambled from within the c-command domain of the concessive clause.

There are several possible ways to handle the phenomena, but as far as scrambling is concerned, it appears that the emergence of the intended interpretation with the zero pronoun can be best analyzed if the scrambled concessive clause is allowed to receive an interpretation in the position of a trace. (cf. Saito (1989)) Within the current framework, this is equivalent to saying that the concessive clause is moved back into a pre-movement site in the derivation to LF and the relevant operator-variable structure is created, exactly in the same way as the non-scrambled sentence. In view of the fact that scrambling does not alter the acceptability of the sentence, this is quite a feasible view, although we cannot entirely exclude the possibility of the well-formedness being checked in other ways.<sup>5</sup>

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5. Another straightforward way to handle the data is to

Another indication that a scrambled constituent can be reconstructed into the position of a trace in the mapping to LF in the case of scrambling may be drawn, as argued in Saito (1989), from the fact that WH-Q binding pertaining to wh phrases that undergo LF Wh raising displays essentially the same distribution. First, notice the fact that just as a bound pronoun is banned from showing up outside the scope of its binder, a wh phrase is prohibited from appearing outside the c-command domain of a Q element, as shown below. (While (11a) is fully acceptable, (11b) is a sheer garbage):

- (11) a. John-ga Mary-ni [ dare-ga kuru ka ] tazune-ta.  
 John-NOM Mary-DAT who-NOM come Q asked  
 'John asked Mary who would come.'
- b. \*John-ga dare-ni [ Mary-ga kuru ka ] tazune-ta.  
 John-NOM who-DAT Mary-NOM come Q asked  
 'John asked t<sub>1</sub> who<sub>1</sub> Mary would come.'

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 adopt the notion of chain-binding, which is discussed in Barss (1986) at length. For ease of reference, let us assume the following version of chain-binding (For discussion, also see Saito (1989)):

- (i) x chain-binds y iff x and y are coindexed, and  
 (a) x c-commands y,  
 or (b) x c-commands a trace of z, where z=y or  
 z contains y.

The minimal desideratum for the present discussion is an appropriate mechanism to ensure the connectivity effect. Thus, even if it turns out that the correct analysis must implement the notion of chain-binding, it will not be so detrimental, at least, to our discussion in this section. However, since there is some other independent reason to opt for the 'reconstruction' analysis in treating the bound anaphora found in scrambled elements, we do not adopt this option here.

In the case of the examples in (11), the contrast in grammaticality between the (a) and (b) examples is accounted for by the Proper Binding Condition, whose requirement states that traces must be bound (in this case, at the LF level). In Japanese, the scope of a wh phrase is marked by the COMP headed by ka, and the wh phrase in (10a)-(10b) is moved to the mostly embedded COMP in LF, as represented in the LF configurations in (12):

- (12) a. [<sub>CP</sub> John-ga Mary-ni [<sub>CP</sub> dare-ga<sub>1</sub> [<sub>IP</sub> t<sub>1</sub> kuru ] ka ]  
           tazune-ta ]  
       b. [<sub>CP</sub> John-ga t<sub>1</sub> [<sub>CP</sub> dare-ni<sub>1</sub> [<sub>IP</sub> Mary-ga kuru ] ka ]  
           tazune-ta ]

With the LF configurations in (12), the discrepancy between (11a) and (11b) in their acceptability is naturally expected from the fact that while the trace created by LF Wh movement in (11a) is bound by dare, the trace in (11b) is left unbound, falling outside the c-command domain of dare, which is in violation of the Proper Binding Condition.

When we take a look at a case like (13b), in which a wh phrase is scrambled to the sentence-initial position out of the embedded clause, we find that the sentence is fairly acceptable, just as in the case of variable-binding, although the wh phrase fails to be c-commanded by the lower COMP on

the surface:

- (13) a. [ John-ga [ Mary-ga dare-ni at-ta ka ] sit-te-iru ]  
John-NOM Mary-NOM who-DAT met Q know  
'John knows who Mary met.'
- b. [ dare-ni<sub>i</sub> [ John-ga [ Mary-ga t<sub>i</sub> at-ta ka ]  
who-DAT John-NOM Mary-NOM met Q  
sit-te-iru ]]  
know  
'Who<sub>i</sub>, John knows t<sub>i</sub> Mary met.'

Example (13b) is derived from (13a) by scrambling dare-ni to the sentence-initial position. Here, the acceptability of (13b), contrasted with (11b), shows that if dare is scrambled out of the embedded clause, it may take embedded scope, regardless of the fact that it stands outside the c-command domain of the embedded COMP at the surface level. The fact that the scrambled version of the sentence is well-formed, just as with the non-scrambled sentence, shows that LF Wh fronting may refer to a structure that is reconstructed in the derivation to LF.

In this connection, it should be kept in mind that variable binding found in a sentence like (14) involves LF Wh raising, since the crucial configuration for the intended bound variable interpretation does not emerge until Wh fronting is invoked in LF:

- (14) [ dare<sub>i</sub>-ga ki-te mo ] boku-wa e<sub>i</sub> awa-nai.  
who-NOM come Q I-TOP  $\emptyset$  meet  
'No matter who comes, I do not meet (him).'

In (14), although the null pronoun is located in the main clause, the zero pronoun can be coindexed with the wh phrase dare, which is embedded in the concessive clause. As argued previously, this type of bound variable interpretation accrues from the construal in which dare, which moves into the embedded COMP in LF, is coindexed with the Q element under government, as represented in (15):

(15) [<sub>CP</sub> dare-ga<sub>1</sub> [<sub>IP</sub> t<sub>1</sub> ki-te ] mo<sub>1</sub> ]<sub>1</sub> boku-wa e<sub>1</sub> awa-nai

As noted earlier, this kind of analysis receives a certain amount of credence from the fact that it is not possible to construct an example of a zero pronoun to get its anaphoric reference from a wh phrase located inside a syntactic island, as in (16):

(16) \* [ [ dare<sub>1</sub>-o suisen-si-ta ] tegami-ga todoi-te mo ]  
           who-ACC recommended letter-NOM come in Q  
 Taroo-wa itioo e<sub>1</sub> at-te-wa mi-masi-ta.  
 Taroo-TOP anyway  $\emptyset$  meet-TOP tried  
 'For whatever, x,y, x is a person, y is a letter that  
 recommended x, if y came in, Taroo tried meeting (him)  
 anyway.'

The unavailability of the bound variable reading for the zero pronominal in (16) shows that a plausible place to get the bound variable interpretation is found in LF after Wh movement takes place. The effect of the island constraint ob-

served above clearly indicates that LF Wh fronting brings out the effect that a zero pronoun can be anaphoric to a wh phrase in a concessive, and that the possibility of variable-binding is structurally defined in terms of the notion of c-command, which holds between the concessive clause carrying the index of the wh phrase and the zero pronominal at LF.

Note that since a scrambled sentence displays essentially the same pattern of distribution as a non-scrambled sentence in regard to empty-pronoun binding, there is no way of forming an appropriate antecedent-variable linking between dare and a zero pronoun in a sentence like (17b) even if the constituent containing the zero pronoun is scrambled from the position internal to the scope domain of the concessive clause:

- (17) a. \*[ [ dare<sub>1</sub>-o suisen-si-ta ] tegami-ga todoi-te mo ]  
           who-ACC recommend letter-NOM come in Q  
 Taroo-wa itioo [ e<sub>1</sub> at-te miyoo to ] omoi-masu.  
 Taroo-TOP anyway  $\emptyset$  meet try that think  
   'For whatever x,y, x is a person, y is a letter  
   which recommends x, if y comes in, Taroo thinks  
   that he tries meeting (him) anyway.'
- b. \*[ e<sub>1</sub> at-te miyoo to ]<sub>j</sub> [ [ dare<sub>1</sub>-o suisen-si-ta ]  
            $\emptyset$  meet try that who-ACC recommend  
 tegami-ga todoi-te mo ] Taroo-wa itioo t<sub>j</sub>  
 letter-NOM come in Q Taroo-TOP anyway  
 omoi-masu.  
 think  
   'That he tries meeting (him), for whatever x,y,  
   x is a person, y is a letter that recommends x,  
   if y comes in, Taroo thinks.'

In the case of (17a), the null pronoun in the embedded clause



is not interpretable as a bound variable of the wh phrase dare, specifically, in the absence of the concessive clause that can carry the scope index of the wh phrase. Likewise, the possibility of the zero-pronoun binding simply does not exist in a sentence like (17b), in which the concessive clause is moved to the front of the matrix clause by scrambling. The failure of coindexing between dare and the zero pronoun in (17b) clearly shows that the interpretive dependence of the zero pronoun as a bound variable crucially hinges on the structural relation of 'c-command', which holds between the concessive clause carrying the scope index of a wh phrase and the zero pronoun at the LF level (after reconstruction).

Sidestepping a little at this moment, it should be mentioned that Saito (1989) argues that since scrambling does not need to establish a semantically significant operator-variable relation, a scrambled element can be freely reconstructed into the position of a trace in the LF component. If this is correct, it is predicted that we will not obtain a reconstruction effect if movement is invoked for the purpose of establishing some kind of operator-variable relation. As far as Japanese goes, this seems, to a certain extent, to be correct, as illustrated in (18):

- (18) a. [ donna-sinamono<sub>1</sub>-ga todoi-te mo ] Taroo-wa [ e<sub>1</sub>  
           what article-NOM reach Q Taroo-TOP  $\emptyset$   
 okut-te-kure-ta ] hito-ni orei-o it-ta.  
 sent person-DAT thank-ACC said

'No matter what article was delivered, Taroo expressed thanks to the person who sent (it).'

- b. ?[ e<sub>1</sub> okut-te-kure-ta ] hito-ni<sub>j</sub>, [ donna-sinamono<sub>1</sub>-  
 ∅ sent person-DAT what article-  
 ga todoi-te mo ] Taroo-wa t<sub>j</sub> orei-o it-ta.  
 NOM reach Q Taroo-TOP thank-ACC said  
 'To the person who sent (it), no matter what  
 article was delivered, Taroo expressed thanks.'
- c. ?\*[ e<sub>1</sub> okut-te-kure-ta ] hito-ni-wa<sub>j</sub>, [ donna-  
 ∅ sent person-DAT-TOP what  
 sinamono<sub>1</sub>-ga todoi-te mo ] Taroo-wa t<sub>j</sub> orei-o  
 article-NOM reach Q Taroo-TOP thank-ACC  
 it-ta.  
 said  
 'As for the person who sent (it), no matter what  
 article was delivered, Taroo expressed thanks.'

There is a minimal difference between (18b) and (18c); the former is derived from (18a) by scrambling the complex NP [ okut-te-kure-ta ] hito and the latter by topicalizing it.<sup>6</sup>

6. A topic wa phrase may have two sources, one base-generated, and the other derived by a movement transformation. In the case of (18c), the topic phrase is case-marked, and therefore it must be exported from the in-situ position, since ni indicates that the topic phrase is a derived one. Now that the topicalized phrase usually does not receive a bound variable interpretation, Hoji (1985) argues that this kind of topic is base generated, so that it fails to obtain the intended interpretation. Hoji's argument crucially draws on examples with non-case-marked topics, and he did not discuss examples like (18c), which contains a PP topic. If it is correct to state, as in Saito (1985), that a PP topic is always derived via movement, rather than base-generated, Hoji's paradigm pertaining to movement versus base-generation breaks down at this point. Moreover, when wa is heavily stressed, it appears that we can obtain the intended variable interpretation even in the case of (18c). If the judgment is correct, we have to conclude that there are some other factors that determine the availability of the bound variable interpretation in the topic phrase when the topic is heavily stressed and that it does not have anything to do with the movement/base-generation dichotomy.

The difference in acceptability between the sentences in (18b) and (18c) shows that a topicalized phrase is prohibited from bearing the same index as the antecedent wh phrase. Disallowance of the intended interpretation in (18c) is straightforwardly accounted for if we assume that the topic phrase establishes some kind of operator-variable relation which resists LF reconstruction, as argued in Saito (1989).<sup>7</sup>

Returning now to the points of controversy, the discussion so far shows that in the case of scrambling, the presence of a trace within the c-command domain of the COMP is held responsible for the availability of the designated interpretation in a sentence like (9b). If our argument thus far is correct, we can state that in the case of scrambling,

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7. We are not claiming that reconstruction is the only way of interpreting a bound variable residing in a moved constituent. This is too strong, at least in consideration of an example like (i):

(i) [ donna-sinamono<sub>1</sub>-ga todoi-te mo ] Taroo-ga orei-o  
       what-article-NOM reach Q Taroo-NOM thanks-ACC  
       it-ta no wa [ e<sub>1</sub> okut-te-kure-ta ] hito-ni da.  
       said that TOP Ø sent person-DAT COP  
       'It was to the person who sent (it) that no matter  
       what article was delivered, Taroo expressed thanks.'

The above-noted cleft sentence establishes an operator-variable structure in syntax, which is, if we follow Saito's claim, plays a significant role in semantic interpretation, but still the sentence is fully acceptable with the indicated interpretation. One possible way to account for the existence of a bound variable interpretation in (i) is to claim that a sentence like (i) involves a different grammatical process from that of a scrambled sentence. Presumably, this claim gains a certain amount of plausibility from the fact that (i) shows full acceptability, while (18b) is marginally acceptable.

the relevant grammatical environment dictated by the operator-forming operation of Wh movement need not take on a full significance until the assumed reconstruction occurs, and that LF Wh movement may be preceded by LF reconstruction. Now, taking this type of interplay between Wh movement and reconstruction at the LF level as a given, let us now move on to consider some cases involving overt pronouns like sore:

- (19) [ Taroo-ga dono-sinamono<sub>i</sub>-o mot-te-ki-te mo ] boku-wa  
 Taroo-NOM which article-ACC bring Q I-TOP  
 sore<sub>i</sub>-o uketora-nai-daroo.  
 it-ACC accept-not-will  
 'No matter which article Taroo brings, I will not accept it.'

In the case of (19), it appears that sore can be connected with the wh phrase dono-sinamono as a bound variable. Faced with an example like (19), we are tempted to facilitate an account to analyze the behavior of sore in an analogous way as that of a zero pronoun, by stating that a relevant configuration for this interpretation arises in the LF component. In fact, Nishigauchi (1986, 1990) has argued that the Q element mo is responsible for the bound variable interpretation of sore and that the bound variable interpretation is possible if it is in the c-command domain of the concessive clause which minimally contains a wh phrase. But his argument does not seem to go through. First, if it were possible to ascribe the bound-variable-like property of sore to

the structural notion of 'c-command', then we would expect that there is a significant difference in acceptability between the following examples:<sup>8</sup>

- (20) a. [ dono-hito<sub>1</sub>-ga ki-te mo ] Taroo-wa [ syatyoo-  
 which person-NOM come Q Taroo-TOP president-  
 ga purezento-ni yorokon-de-ita ] koto-o  
 NOM present-with was pleased that-ACC  
 sono-hito<sub>1</sub>-ni tuge-ta.  
 it-person-DAT told  
 'No matter who comes, Taroo told him that the  
 president was pleased with the present.'
- b. ?Taroo-wa [ syatyoo-ga [ dono-hito<sub>1</sub>-ga ki-te  
 Taroo-TOP president-NOM which person-NOM come  
 mo ] purezento-ni yorokon-de-ita ] koto-o  
 Q present-with was pleased that-ACC  
 sono-hito<sub>1</sub>-ni tuge-ta.  
 its-person-DAT told  
 'Taroo told him that no matter who comes, the  
 president will be pleased with the present.'

Although the second example might be slightly downgraded, the sentences above are both fairly acceptable, and in particular, (20b), which is predicted to be ungrammatical under Nishigauchi's analysis, does not specially sound bad with the intended interpretation.<sup>9</sup> Despite the fact that the binder

8. In (20), sono is used instead of sore. I assume here that sono has the same function as sore, since both pronominals are classified as the class of so-pronouns.

9. Nishigauchi (1986) cites the following example to argue for his analysis (The judgment is his):

- (i) \*[ [ dono-ronbun<sub>1</sub>-ga saiyoosare-te mo ] kamawa-nai ]  
 which paper-NOM be accepted Q care-not  
 hito-ga sore<sub>1</sub>-o yon-da.  
 person-NOM it-ACC read  
 'The person who, no matter which paper was accepted, did  
 not care read it.'

of the *wh* phrase does not c-command the pronoun sono in (20b), the sentence is fairly acceptable. If the judgment is correct, the fact strongly suggests that sore should not be regarded as a bound variable, which we assume to be subject to the Scope Condition.

Furthermore, if we take a look at an example in which a complex NP is scrambled out of the scope of a concessive clause, it will turn out that LF is, in fact, irrelevant for the interpretation of sore. Bearing in mind that the connectivity effect displayed in the case of scrambling is one of the notable properties of a quantificational structure formed at the LF level, let us consider the following:

- (21) a. [ dono-sinamono<sub>1</sub>-ga okur-are-te-kite mo ] Taroo-wa  
           which article-NOM be sent Q Taroo-TOP  
           [ sore<sub>1</sub>-o okuri kaesu ] koto-o meizi-ta.  
           it-ACC send back that-ACC ordered  
           'No matter which article was sent, Taroo gave an  
           order to send it back.'
- b. \*[ sore<sub>1</sub>-o okuri-kaesu ] koto-o<sub>j</sub>, [ dono-sinamono<sub>1</sub>-  
           it-ACC send back that-ACC which article-  
           ga okur-are-te-kite mo ] Taroo-wa t<sub>j</sub> meizi-ta.  
           NOM be sent Q Taroo-TOP ordered  
           'To send it back, no matter which article was sent,  
           Taroo gave an order.'

The sentences in (21) are exactly like those in (9), except that the zero pronoun is replaced by the overt pronominal sore, and in the case of (21b), unlike (9b), the expected bound variable interpretation is not available. Since we know that it is possible to interpret a scrambled constituent

in the position of a trace in the LF component in the case of scrambling, the behavior of an overt pronoun like sore shows that its coreference possibility is determined prior to LF (presumably at S-structure), and that LF reconstruction is irrelevant for the pronominal anaphora involving sore.<sup>10</sup> Specifically, in the case of (21b), the complex NP [sore-okuri-kaesu ] koto, which is scrambled to the front, has its trace in the position which is c-commanded by the concessive clause, and if the overt pronoun sore could serve as a bound variable, we would expect that coindexing between sore and its antecedent indicated in (21b) should be acceptable, just as in (9b), since LF Wh movement may follow LF reconstruction. The impossibility of coindexing between dono-sinamono and sore demonstrated in (21b) then gives us a good indication that the anaphoric reference of sore is fixed prior to the emergence of a quantificational structure that underlies a bound variable interpretation, and this entails that sore is not bound at all at the LF level. The peculiar behavior of sore clearly shows that sore cannot be used as a syntactic variable of a wh expression, and that antecedent-sore relations are not interpreted in the same way as relations between antecedents and the empty pronouns they bind.

Summarizing, the foregoing observations show that zero

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10. This appears to show that sore patterns with an overt pronominal like kare, which is subject to Condition B of the Binding Theory.

pronouns have restricted scope and coindexing possibilities, which comport with the Scope Condition as standardly formulated, but overt pronouns like sore not only have looser coindexing possibilities, but also are prohibited from undergoing LF reconstruction. In order to account for a cluster of properties pertaining to sore, what is needed to assume is that sore patterns very differently from a zero pronoun and that it should not be regarded as functioning as a 'true' bound variable.

As hinted above, one plausible alternative view for sore is that sore can be understood as referring to an individual or a group determinable on the basis of the interpretation of its antecedent in an appropriate context, serving as some kind of 'pragmatic' pronoun. However, since there is not as yet a precise understanding of the issue, we have to defer the full discussion of the problem of why overt pronominals like sore exhibit the quasi-properties of bound variables until a fuller understanding of the phenomena is reached.

### 6.3. Scrambling and Complementizer Deletion.

With regard to the facts concerned with variable binding discussed above, we may have either the analysis utilizing the notion of reconstruction or the one with chain-binding. But the assumption that scrambled constituents may be susceptible to the rule of reconstruction in the derivation of LF



appears to have some other interesting consequences, and as far as scrambling goes, it appears that the reconstruction analysis is preferred over the chain-binding analysis. As an independent motivation for the analysis we are advocating, we will, in this section, discuss the correlation between the deletability of a lexical complementizer and the extractability of a wh phrase. The fact that scrambling does not alter the extractability of a wh phrase raises interesting questions about the status of scrambling, and we will argue in the following that the fact can be afforded a natural account if it is assumed that a scrambled element is placed back into its original position in LF.

First of all, notice, as Stowell (1981a) observes, that the extractability of a lexical item closely correlates with the deletability of a lexical complementizer. Observe the following English examples, which display a contrast in acceptability between bridge and non-bridge verbs with regard to the extraction of a wh phrase:

- (22) a. What did Mary say that John saw?  
b. ??What did Mary whisper that John saw?

While extraction is possible from an associated clause of the bridge verb say, the extraction of a wh phrase from a lower clause of the non-bridge verb (or the manner-of-speaking verb) whisper shows a mild Subjacency effect. The difference

in acceptability between bridge and non-bridge verbs observed above is indicative of the islandhood of the clause under consideration. As was pointed out in Stowell (1981a), the fact that a *wh* phrase may or may not move through a lower clause is correlated with the question of whether or not the complementizer in the subordinate clause can be empty:

(23) a. Mary said (that) John left.

b. Mary whispered \*(that) John left.

As shown above, bridge verbs such as say, think, etc. starkly contrast with non-bridge verbs such as whisper, murmur, etc. with regard to the omission of the that complementizer. A comparison between (23a) and (23b), along with the grammatical contrast in extractability between (22a) and (22b) verifies the adequacy of the generalization that the deletability of a lexical complementizer is, in fact, tightly correlated with the possibility of movement from the embedded clause.

Within the framework of the Government and Binding theory, it is often claimed that both constraints are derived from the condition on lexical government and the correlation between them is accounted for by the notion of the CED, or more recently, by the notion of 'barrier'. Under these assumptions, extraction from within a maximal projection is permitted only when the maximal projection is lexically

governed (or L-marked). Since a maximal projection which is not lexically governed usually forms a barrier for movement, we obtain a general prohibition against extraction from such a maximal projection.

To be a little more specific, we assume here, with Stowell (1981a), that bridge verbs take their lower clauses as complements, while non-bridge verbs as non-complements. On this assumption, we can say that only the associated clause of a bridge verb is lexically governed by a higher predicate. If so, it is naturally anticipated that while the lower clause of a bridge verb is transparent to movement, the associated clause of a non-bridge verb is not. In fact, in (22a), what can be preposed to the matrix COMP with no Subjacency violation. By contrast, if what is extracted from the subordinate clause of a non-bridge verb, the acceptability of the sentence considerably decreases, displaying a mild Subjacency effect, as in (22b). The contrast observed between bridge and non-bridge verbs in regard to the extractability of wh phrases finds a natural explanation if we assume that the bridge verb lexically governs its associated clause, while the non-bridge verb does not.

By the same token, under this analysis, it can be stated the deletability of a lexical complementizer is also contingent on whether or not a subordinate clause is lexically governed. Since the theory of government usually requires an empty category to be properly governed, it is in fact

reasonable to assume that a phonetically null complementizer must also be lexically governed by a higher verb. If this assumption is correct, then the contrast with regard to the deletability of a lexical government also straightforwardly follows. In (23a), for instance, the presence of a lexical complementizer is optional since the bridge verb say lexically governs its lower clause. In contrast to this, the presence of the that complementizer is mandatory with the non-bridge verb whisper, because its associated clause is not lexically governed by whisper. In our terms, the contrast with respect to the possibility of an empty complementizer can be accounted for by referring to lexical government, and if this is correct, these apparently unrelated phenomena are collapsed into a single constraint and receive a unified account in terms of lexical government.<sup>11</sup>

Prior to discussing the details of problems involving scrambling, let us see for the moment whether the above-noted generalization actually holds true in other constructions in order to confirm the adequacy of the approach. Consider the

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11. It must be pointed out that the correlation between that-deletion and extraction is far from complete, in the presence of examples like (ia) and (ib):

- (i) a. He regretted \*(that) he did not finish his work.
- b. What did he regret that he did not finish?

Notwithstanding the existence of the examples above, the correlation between them appears to be strong enough to motivate an analysis which views that both phenomena are essentially derived from a single constraint. (cf. Erteschik-Shir (1973) Stowell (1981a, 1981b), Chomsky (1986b), Postal (1974))

following examples:

- (24) a. It is likely (that) John loves Mary.  
b. \*(That) John loves Mary is likely.

It should be noted that the example in (24b) without an overt complementizer is ungrammatical, while an analogous example where the subordinate clause occur in object position as in (24a) is grammatical with or without the presence of a lexical complementizer. The explanation for this contrast goes as follows: In (24a), the presence of the lexical complementizer is optional, since the embedded clause is lexically governed by the higher predicate likely, satisfying the government requirement. On the other hand, the omission of the complementizer is not admissible in (24b), because the complement clause in subject position is never lexically governed by likely.

It is fairly easy to demonstrate, with examples like (24), that the deletability of the lexical complementizer is actually correlated with the possibility of exporting a wh phrase out of the lower clause, because lexical government is responsible for the barrierhood of an embedded clause in question. With this in mind, witness the contrast in grammaticality between the sentences below:

- (25) a. Who is it likely that John loves?

b. \*Who<sub>i</sub> is [ that John loves t<sub>i</sub> ] likely?

The ungrammaticality of (25b) reveals that the subordinate clause in subject position in fact constitutes a syntactic island for movement. The long distance movement of a wh phrase is prohibited in the case of (25b). In contrast, it is possible to extract a wh phrase from the subordinate clause of likely in (25a), because the lower clause is lexically governed by likely, (as evidenced by the deletability of a lexical complementizer in (24b)).

The analysis which attributes the missing complementizer to the requirement of lexical government makes an interesting prediction that the same correlation holds for constructions involving topicalization such as (26):

(26) a. Mary believes (that) John loves Sally.

b. \*(That) John loves Sally, Mary believes.

In (26a), the presence of a lexical complementizer is optional, since believe lexically governs its associated clause that follows. On the other hand, the topicalized subordinate clause cannot be lexically governed by believe, because it is fronted, and the overt that complementizer of the topicalized clause is thereby not deletable. The analysis furthermore predicts that extraction will be impossible from the topicalized clause, though it is possible from the non-topicalized

clause, and this prediction is, in fact, verified by (27):

(27) a. Who does Mary believe that John loves?

b. \*Who<sub>i</sub> [ that John believes t<sub>i</sub> ], Mary believes?

Further support for the claim that the deletion of a lexical complementizer requires lexical government comes from sentences like (28), where the that complement clause is separated from the verb believe, with an adverb interpolated between believe and that:

(28) a. Mary believes (that) John loves Sally.

b. Mary believes firmly \*(that) John loves Sally.

It is obvious that while the subordinate clause can be governed by believe in the case of (28a), the extraposed clause in (28b) cannot be governed by the verb believe, on account of the intervening adverb firmly. Consequently, the that complementizer in (28b) is not allowed to be empty. As expected from our analysis, again, we obtain the following contrast in the extractability of a wh phrase from the subordinate clause:

(29) a. Who does Mary believe that John loves?

b. ?\*Who does Mary believe firmly that John loves?

We can explicate the non-occurrence of (29b) on the basis of believe not governing the extraposed lower clause. In the case of (29b), since the extraposed clause is not lexically governed by believe, the long distance extraction originating from the extraposed subordinate clause is not permitted. The set of data presented here gives us a clear indication that government by a lexical head determines both the extractability of a wh phrase and the deletability of a lexical complementizer.

As mentioned above, the correlation between the extractability of a wh phrase and the possibility of an empty complementizer generally holds in English bridge and non-bridge verbs, but it must be pointed out here that the familiar contrast between bridge and non-bridge verbs appears to disappear in multiple wh questions. As the acceptability of the sentences below shows, the scope of wh-in-situ does not conform to our generalization:

(30) a. Who said that Mary liked who?

b. Who whispered that Mary liked who?

The lack of a familiar contrast in acceptability between (30a) and (30b) is problematic in any orthodox version of the GB theory, but as argued earlier, since the wh-in-situ are not moved even in LF, and since they receive scope by unselective binding (under our view), the absence of a Sub-



Subjacency effect in (30b) naturally follows in our analysis. To be a little more concrete, from our standpoint, the sentences in (22), which I repeat as (31), involve movement of a wh phrase, and so we obtain the expected contrast in acceptability between the examples:

- (31) a. What did Mary say that John saw?  
 b. ??What did Mary whisper that John saw?

In the examples in (30), by contrast, the scope of the wh-in-situ in the subordinate clause is not relegated to the LF version of Wh fronting by our account. Since the wh-in-situ are not moved out of a lower clause in the examples in (30), no Subjacency effects are found in these sentences, as illustrated by the following LF structures:

- (32) a. [ who<sub>1(j)}</sub> [ t<sub>1</sub> said [ that Mary liked who<sub>(j)}</sub> ] ] ]  
 b. [ who<sub>1(j)}</sub> [ t<sub>1</sub> whispered [ that Mary liked who<sub>(j)}</sub> ] ] ]

In our analysis, the absence of the expected contrast in acceptability between the sentences in (30) is a natural consequence of the fact that no extraction takes place out of the subordinate clause in sentences like (30). The unselective binding analysis of multiple wh questions shows that no preposing of a wh phrase is involved in the LF structures in

the sentences in (32). If this analysis is correct, we can state that the generalization that whenever movement of a lexical item occurs out of the lower clause of a non-bridge verb, the movement displays an effect of Subjacency is sustained with full generality.

Turning to Sinhalese cases, it should be pointed out at the outset that the same correlation can be found in Sinhalese bridge and non-bridge verbs. First, let us consider the possibility of an empty complementizer. As mentioned above, Sinhalese bridge verbs contrast with non-bridge verbs in regard to the deletability of a lexical complementizer:

- (33) a. Ranjit [ Chitra iie            Ram-wə dækka (kiyəla) ]  
 Ranjit Chitra yesterday Ram-ACC saw that  
 kiiwa.  
 said  
 'Ranjit said that Chitra saw Ram yesterday.'
- b. Ranjit [ Chitra iie            Ram-wə dækka \*(kiyəla) ]  
 Ranjit Chitra yesterday Ram-ACC saw that  
 kendiruwa.  
 whispered  
 'Ranjit whispered that Chitra saw Ram yesterday.'

The data in (33) suggests that Sinhalese, just like English, has a contrast between bridge and non-bridge verbs with regard to the deletability of a lexical complementizer. The acceptability of complementizer deletion with a bridge verb implies that the lower clause is lexically governed by the higher predicate kiiwa 'said', whereas that of the non-bridge verb kendiruwa 'whispered' is not.

Interestingly, the generalization that extraction from a lower clause is possible with bridge verbs, but not with non-bridge verbs, appears to hold true for Sinhalese as well. The same contrast which obtains in (22) is observed in the case of LF extraction of a wh phrase in Sinhalese, as shown in (34):

- (34) a. Ranjit [ Chitra mokaa-tə-də gəhuwa kiyəla ] kiiwe?  
 Ranjit Chitra what-DAT-Q hit that said  
 'What did Ranjit say that Chitra hit?'
- b. \*Ranjit [ Chitra mokaa-tə-də gəhuwa kiyəla ]  
 Ranjit Chitra what-DAT-Q hit that  
 kendiruwe?  
 whispered  
 'What did Ranjit whisper that Chitra hit?'

Since the Q particle is directly adjoined to a wh phrase inside a subordinate clause in (34), the kind of movement required in the LF derivation is the fronting of the wh phrase mokaa-tə. As the wh phrase must be extracted from the lower clause at the LF level in this grammatical context, the ill-formedness of (34b) obviously comes from the illicit movement of mokaa-tə from the lower clause of a non-bridge verb. The fact that Sinhalese exhibits the familiar contrast of acceptability between bridge and non-bridge verbs gives us a clear indication of the status of LF Wh fronting, and suggests that extraction of a wh phrase from a lower clause of a non-bridge verb, but not a bridge verb, incurs a

Subjacency violation even at LF.

To digress a little, it is worthwhile to note that the familiar contrast in acceptability that obtains between bridge and non-bridge verbs vanishes when pied piping takes place:

- (35) a. Ranjit [ Chitra mokaa-tə gəhuwa kiyəla ]-də kiiwe?  
Ranjit Chitra what-DAT hit that -Q said  
'Ranjit said that Chitra hit what?'
- b. Ranjit [ Chitra mokaa-tə gəhuwa kiyəla ]-də  
Ranjit Chitra what-DAT hit that -Q  
kendiruwe?  
whispered  
'Ranjit whispered that Chitra hit what?'

The above examples are both grammatical and do not show a contrast in acceptability regardless of the choice of predicate. What is notable about the sentences in (35) is that the Q morpheme is adjoined to the subordinate clause of the verb. Since the wh phrase can pied pipe the subordinate clause with it by virtue of the presence of the Q element which is adjoined to the subordinate clause, the whole clause containing the wh phrase may undergo Wh fronting at LF in the case of (35). In this case, both sentences turn out to be well-formed, for the movement of the whole clause does not involve the crossing of any barrier.

Bearing in mind that Sinhalese bridge and non-bridge verbs, just as with those in English, differ in the extent to

which they permit extraction of a wh word from their associated clause, let us consider some examples involving scrambling. As a point of departure, let us note that in Sinhalese, the effect of scrambling is brought out by a leftward movement, as in (36b):

- (36) a. Chitra iie                      Ranjit-wə dækka.  
           Chitra yesterday Ranjit-ACC saw  
           'Chitra saw Ranjit yesterday.'
- b. Ranjit-wə<sub>1</sub>, Chitra iie                      t<sub>1</sub> dækka.  
           Ranjit-ACC Chitra yesterday                      saw  
           'Ranjit, Chitra saw yesterday.'

Sinhalese also allows reordering of constituents in such a way that a nominal expression is moved to the right of the predicate, as in (37b):

- (37) a. Chitra iie                      Ranjit-wə dækka.  
           Chitra yesterday Ranjit-ACC saw  
           'Chitra saw Ranjit yesterday.'
- b. Chitra iie                      t<sub>1</sub> dække Ranjit-wə<sub>1</sub>  
           Chitra yesterday                      saw                      Ranjit-ACC  
           'It was Ranjit that Chitra saw.'

As the translation indicates, the sentence in (37b), in which Ranjit-wə is postposed across the predicate dække, involves a cleft interpretation. The examples in (36) and (37) illustrate that Sinhalese is characterized as having two major movement operations, namely, scrambling, which is a leftward movement, and clefting, which is a rightward movement.

Turning to the issue of the bridge/non-bridge distinction in Sinhalese, observe first that complementizer deletion is in no way permitted if the embedded clause is fronted across the subject via scrambling:

- (38) a. [ Chitra iie                    Ram-wə dækka \*(kiyəla) ]<sub>1</sub> Ranjit  
           Chitra yesterday Ram-ACC saw            that            Ranjit  
           t<sub>1</sub> kiiwa.  
           said  
           'That Chitra saw Ram yesterday, Ranjit said.'
- b. [ Chitra iie                    Ram-wə dækka \*(kiyəla) ]<sub>1</sub> Ranjit  
           Chitra yesterday Ram-ACC saw            that            Ranjit  
           t<sub>1</sub> kendiruwa.  
           whispered  
           'That Chitra saw Ram yesterday, Ranjit whispered.'

The reason why complementizer deletion is not permitted in sentences like (38) is obviously that scrambling precludes the possibility that the subordinate clause is governed by the predicate. One indication of the correctness of our view that government, rather than adjacency, is at issue here is given by the example below, which involves a coordinate construction:

- (39) Aruna [ Ranjit Ram-wə hambə unaa kiyəla ] iilangetə  
           Aruna    Ranjit Ram-ACC meet    became that    and  
           [ Dileep Chitra-wə hambə unaa \*(kiyəla) ] kiiwa.  
           Dileep Chitra-ACC meet    became that    said  
           'Aruna said that Ranjit met Ram and that Dileep  
           met Chitra.'

The example is quite telling in the sense that although the

lexical complementizer in the second conjunct of the coordinated clause is adjacent to the bridge verb, which allows the deletion of a lexical complementizer, the surface appearance of the complementizer is required (i.e. the complementizer cannot be elided).<sup>12</sup> If complementizer deletion took place locally as specified by adjacency, we would expect (39) to be acceptable, even without the lexical complementizer. Contrary to the predication, the omission of the complementizer is not tolerable. In contradistinction to this, if we assume that government by the predicate is pertinent to complementizer deletion, then we can correctly predict that an overt complementizer is required in (39).<sup>13</sup>

If our characterization of complementizer deletion is

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12. The precise details of the coordinate structure in (39) is not of immediate relevance to the present discussion, but it should be noted that on the surface, the possibility of complementizer deletion in English differs from that of Sinhalese, since the first conjunct of the coordinate structure in (i) admits complementizer deletion (cf. Postal (1974)):

(i) John said (that) Mary will come, but that John won't.

The possibility of that-deletion manifested in (i), at first blush, might look as though English differs from Sinhalese, but we take this fact to be a sign indicating that English involves a grammatical operation that is different from Sinhalese. In English, the deletion of that-complementizer is sometimes possible even when that-clause does not immediately follow the verb of which it is the complement, as in (ii):

(ii) It seems to me (that) John likes dogs.

13. A verb cannot govern a complementizer inside of a coordinate structure, because there is an extra maximal projection that intervenes between the verb and the complementizer. Thus, an overt complementizer cannot be removed in either conjunct in the case of (39).

correct, then it is predicted that the scrambled clause will not be transparent to movement in any case, and that movement of a wh phrase out of the scrambled clause will necessarily be ruled out. This prediction, however, fails to obtain, as shown in (40):

- (40) a. [ Chitra mokaa-tə-də gəhuwa kiyəla ]<sub>1</sub> Ranjit t<sub>1</sub>  
           Chitra what-DAT-Q hit that Ranjit  
           kiiwe?  
           said  
           'What did Ranjit say that Chitra hit?'
- b. \*[ Chitra mokaa-tə-də gəhuwa kiyəla ]<sub>1</sub> Ranjit t<sub>1</sub>  
           Chitra what-DAT-Q hit that Ranjit  
           kendiruwe?  
           whispered  
           'What did Ranjit whisper that Chitra hit?'

If we assume, as in Saito (1985), that scrambling involves an S-adjunction (alias, IP-adjunction), the scrambled subordinate clause is necessarily moved to an ungoverned position, since an adjunction site is always ungoverned.<sup>14</sup> In the case

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 14. It goes without saying that the entire subordinate clause can undergo Wh movement without giving rise to a Subjacency violation even if it is scrambled across the subject, as indicated below:

- (i) a. [ Chitra mokaa-tə gəhuwa kiyəla ]-də<sub>1</sub> Ranjit t<sub>1</sub> kiiwe?  
           Chitra what-DAT hit that -Q Ranjit said  
           'That Chitra hit what, Ranjit said?'
- b. [ Chitra mokaa-tə gəhuwa kiyəla ]-də<sub>1</sub> Ranjit t<sub>1</sub>  
           Chitra what-DAT hit that -Q Ranjit  
           kendiruwe?  
           whispered  
           'That Chitra hit what, Ranjit whispered?'



of extraction from the scrambled position, then, it is anticipated that the exportation of a part of the embedded clause should always lead to a Subjacency violation, but the contrast in extractability between bridge and non-bridge verbs is, nevertheless, preserved, as is clearly exemplified above.<sup>15</sup>

In the case of a rightward movement, which is found in a cleft sentence, the pattern of distribution that is pertinent to scrambling is not observed. In effect, as illuminated below, the kind of demarcation between bridge and non-bridge verbs that we observed above does not obtain when the subordinate clause is clefted:

- (41) a. \*Ranjit t<sub>1</sub> kiiwe [ Chitra mokaa-tə-də gəhuwa  
           Ranjit       said       Chitra what-DAT-Q hit  
           kiyəla ]<sub>1</sub>?  
           that  
           'What did Ranjit say that Chitra hit?'
- b. \*Ranjit t<sub>1</sub> kendiruwe [ Chitra mokaa-tə-də gəhuwa  
           Ranjit       whispered   Chitra what-DAT-Q hit  
           kiyəla ]<sub>1</sub>?  
           that  
           'What did Ranjit whisper that Chitra hit?'

The case of extracting a wh phrase from a clefted clause dif-

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15. Fiengo, Huang, Lasnik and Reinhart (1988) put forward a claim to the effect that if an island is IP-adjoined, it ceases to be an island for extraction. Obviously, this proposal cannot provide any account for the fact that the grammatical contrast between bridge and non-bridge verbs is preserved in scrambling.

fers from the case of extracting from a clause that is scrambled in that the former always incurs a Subjacency violation. That the clefted clause is ungoverned is suggested by the impossibility of an empty complementizer in (42):

- (42) a. Ranjit  $t_1$  kiiwe [ Chitra iie Ram-wə dəkka  
 Ranjit said Chitra yesterday Ram-ACC saw  
 \*(kiyəla) ]<sub>i</sub>.  
 that  
 'It was Chitra's seeing Ram yesterday that Ranjit  
 said about.'
- b. Ranjit  $t_1$  kendiruwe [ Chitra iie Ram-wə dəkka  
 Ranjit whispered Chitra yesterday Ram-ACC saw  
 \*(kiyəla) ]<sub>i</sub>.  
 that  
 'It was Chitra's seeing Ram yesterday that Ranjit  
 whispered.'

The fact that a lexical complementizer cannot be elided in the sentences above is straightforwardly accounted for in terms of the assumption that the clefted clause is ungoverned. Needless to say, the entire clause that is clefted can be susceptible to LF Wh raising (by way of LF pied piping), without incurring a Subjacency violation, as illustrated by the acceptability of the sentences in (43):

- (43) a. Ranjit  $t_1$  kiiwe [ Chitra mokaa-tə gəhuwa  
 Ranjit said Chitra what-DAT hit  
 kiyəla ]-də<sub>i</sub>?  
 that -Q  
 'Chitra's hitting what was it that Ranjit said  
 about?'

- b. Ranjit t<sub>1</sub> kendiruwe [ Chitra mokaa-tə gəhuwa  
 Ranjit whispered Chitra what-DAT hit  
 kiyəla ]-də<sub>1</sub>?  
 that -Q  
 'Chitra's hitting what was it that Ranjit whispered?'

The array of data discussed here concerning cleft sentences shows that the behavior of cleft sentences comports nicely with our initial prediction, in that extraction of a wh phrase from the displaced clause and the erasure of a lexical complementizer tie together and that they are both infelicitous in a clefted clause, regardless of the choice of the predicate.

Turning to cases in Japanese briefly here, the generalization that extraction from a clausal complement is allowed for bridge verbs, but not for non-bridge verbs, holds true for Japanese as well. The relevant bridge/non-bridge contrast is observed in the case of LF extraction of naze, as shown in (44):

- (44) a. Mary-wa [ John-ga naze Taroo-o kubi-ni si-ta to ]  
 Mary-TOP John-NOM why Taroo-ACC fire did that  
 it-ta no?  
 said Q  
 'Why did Mary say that John fired Taroo?'
- b. ??Mary-wa [ John-ga naze Taroo-o kubi-ni si-ta  
 Mary-TOP John-NOM why Taroo-ACC fire did  
 to ] sasayai-ta no?  
 that whispered Q  
 'Why did Mary whisper that John fired Taroo?'

Notice that movement of naze occurs in LF, but the familiar contrast of bridge and non-bridge verbs obtains. In this connection it should be noted that in the case of Japanese, it is necessary to use naze to determine the islandhood of a particular clause, since we need to eliminate the option of LF pied piping.

The contrast observed with regard to the bridge and non-bridge distinction is not limited to cases where LF movement of a wh phrase is invoked from a non-scrambled position. The same kind of contrast in acceptability appears to obtain even when the entire clause is scrambled out of the original position, as the following pair of sentences exemplifies:

- (45) a. [ John-ga naze Taroo-o kubi-ni si-ta to ]<sub>1</sub>  
           John-NOM why Taroo-ACC fire did that  
           Mary-wa t<sub>1</sub> it-ta no?  
           Mary-TOP said Q  
           'Why did Mary say that John fired Taroo?'
- b. ??[ John-ga naze Taroo-o kubi-ni si-ta to ]<sub>1</sub>  
           John-NOM why Taroo-ACC fire did that  
           Mary-wa t<sub>1</sub> sasayai-ta no?  
           Mary-TOP whispered Q  
           'Why did Mary whisper that John fired Taroo?'

In the case of the scrambled sentences, the extraction of naze from lower clauses of bridge and non-bridge verbs takes place in the exactly the same way as in the non-scrambled sentences. In effect, the fact that the same pattern of acceptability as that in (44) obtains in (45) in regard to LF extraction of naze shows that Japanese behaves exactly the

same way as Sinhalese in this respect.

On the basis of the observed contrast between bridge verbs and non-bridge verbs, we also anticipate that the presence of a lexical complementizer is optional with a bridge verb but that it is obligatory with a non-bridge verb. Contrary to the expectation, however, complementizer deletion is not possible even with a bridge verb, as illustrated below:

- (46) a. Mary-wa [ John-ga Taroo-o kubi-ni si-ta \*(to) ]  
Mary-TOP John-NOM Taroo-ACC fire did that  
it-ta.  
said  
'Mary said that John fired Taroo?'
- b. Mary-wa [ John-ga Taroo-o kubi-ni si-ta \*(to) ]  
Mary-TOP John-NOM Taroo-ACC fire did that  
sasayai-ta.  
whispered  
'Mary whispered that John fired Taroo?'

Although the omission of a lexical complementizer is not allowed in Standard Japanese, it must be pointed out that the familiar contrast with regard to the deletion of a complementizer often emerges in Western (Kansai) dialects of Japanese, as in (47) (cf. Saito (1986)):

- (47) a. Mary-wa [ John-ga Taroo-o kubi-ni si-ta (yuute) ]  
Mary-TOP John-NOM Taroo-ACC fire did that  
yuute-ta.  
said  
'Mary said that John fired Taroo.'
- b. Mary-wa [ John-ga Taroo-o kubi-ni si-ta  
Mary-TOP John-NOM Taroo-ACC fire did

\*(yuute) ] sakende-ta.  
 that cried  
 'Mary cried that John fired Taroo.'

It is self-evident that government by a lexical head (at the S-structure level) plays a key role in determining the deletability of a complementizer in the Western dialect, because complementizer deletion is not allowed if the embedded clause is fronted by scrambling:

(48) [ John-ga Taroo-o kubi-ni si-ta \*(yuute) ]<sub>1</sub>  
 John-NOM Taroo-ACC fire did that  
 Mary-wa t<sub>1</sub> yuute-ta.  
 Mary-TOP said  
 'That John fired Taroo, Mary said.'

It remains unclear why Standard Japanese does not allow complementizer deletion, but the examples in (47), together with (48), can be taken as a sign that the relevant distinction on lexical government at S-structure holds true for bridge and non-bridge verbs even in Japanese.

The generalizations we can draw from these observations are as follows: When the displacement of a subordinate clause from a position selected by a predicate is effected by scrambling, it is incumbent upon the choice of the predicate whether or not a wh phrase is extractable from the clause that is moved, and if a lower clause is vacated from a sub-categorized position by other means of movement, Wh raising simply cannot extract a wh phrase in such a way that it moves

through the subordinate clause, regardless of the choice of the predicate. This illustrates that the relevant distinction between bridge and non-bridge verbs is preserved with respect to LF Wh extraction when an embedded clause is moved via scrambling. The possibilities of complementizer deletion are, by contrast, solely dependent on S-structure configurations, and the omission of a lexical complementizer is simply disallowed if the lower clause is vacated from the complement position, while it is possible if the complement clause remains its original position (with the exception of Standard Japanese).

When presented with these facts, it turns out that the parallel between the extractability of a wh phrase and the deletability of a lexical complementizer consistently breaks down when a clause is moved via scrambling. Since an adjunction site via scrambling is usually considered as an ungoverned position, and since the property of government is not preserved by movement in general, it is clear that in the case of scrambling, LF Wh extraction can refer to a pre-scrambling configuration (via LF reconstruction), while complementizer deletion is contingent upon an S-structure configuration. To dispense with the apparent incongruity, then, what is needed to assume is that LF Wh movement, but not complementizer deletion, applies subsequent to LF reconstruction. Under this assumption, it is expected that the contrast between bridge and non-bridge verbs is observed in the

case of Wh raising, since Wh fronting can refer to pre-scrambling configurations. But in the case of complementizer deletion, we do not obtain the expected contrast between them, since complementizer deletion applies on S-structure configurations. Given this assumption, we can account for the divergence of these two phenomena without giving up our initial assumption concerning the extractability of a wh phrase and the deletability of a lexical complementizer. By stating that reconstruction offers an input to Wh movement, but not to complementizer deletion, we can readily eliminate the problem posed by the analysis which implements a single constraint to regulate both the extractability of a wh phrase and the deletion of a lexical complementizer.

In brief, our discussion in this section shows that by assuming that scrambled elements are subject to reconstruction (rather than chain-binding) in the derivation of LF, we can offer an interesting account for the correlation between the extractability of a wh phrase and the possibility of complementizer deletion, with full generality, which would otherwise be quite difficult to explain. It can be concluded from this that in the case of scrambling, scrambled elements can be interpreted in the position of a trace in the mapping to LF, via LF reconstruction (rather than chain-binding).

#### 6.4. Summary



In this chapter, we have first argued that overt pronouns like sore, in opposition to zero pronouns, do not act as bound variables, based on the fact that scrambled constituents containing sore consistently resist LF reconstruction. The analysis crucially depends on the assumption that scrambled constituents can be interpreted in the position of a trace in LF. To confirm the validity of our analysis, we have then provided some arguments in favor of the view that LF reconstruction may take effect in the LF derivation in the case of scrambling, using the contrast we obtain between bridge and non-bridge verbs in regard to the extractability of a wh phrase and the deletability of a lexical complementizer.

## CHAPTER 7

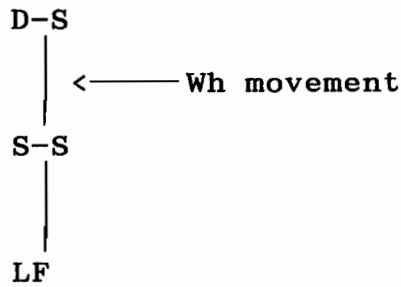
### FINAL REMARKS

Having examined the precise details of Wh constructions, including Wh questions, concessive clauses, we are now in a position to give the picture that has emerged from the discussion presented in this dissertation. As was already noted, to the extent that our theory acknowledges the existence of the three levels of representation of D-structure, S-structure and LF in a specific way as standardly assumed, our analysis concurs with the standard framework of the GB approach. But in the discussion, we have argued that the domain where the rule of move 'wh' applies is more restricted than is assumed in the literature, and that the place where Wh raising is invoked differs depending on language type: In English, Wh raising takes place only in syntax, namely, in the mapping from D-structure onto S-structure, and the LF derivation of Wh movement does not exist. In contrast to this, Japanese and Sinhalese do not employ S-structure movement of wh phrases, but they have the rule of Wh fronting in the domain of logical syntax, i.e. in the mapping from S-structure onto LF. This is illustrated in (1):<sup>1</sup>

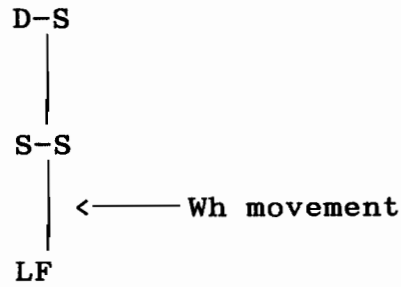
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1. The analysis carries the implication that natural languages are divided into two classes, according to whether Wh movement is invoked in syntax or in LF. But it appears that

(1) a. English



b. Japanese, Sinhalese



The core of our theory presented in this thesis lies in the fact that our analysis establishes that Subjacency is a general constraint on movement rules, irrespective of whether they occur in syntax or in LF. While the standard analysis in general states that the lack of Subjacency effects in the scope of wh-in-situ in English is derived from the assumption that Subjacency (universally) applies before LF movement of wh phrases, our proposal states that the fact that the effect of Subjacency is absent in their scope is a consequence of the fact that it is generated by means of unselective binding. The unselective binding analysis claims that no Wh movement is involved in the scope of wh-in-situ in the case of English, as represented in the LF construal in (2b) posited for (2a):

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this classification is not precise enough in light of the existence of a language like French, where Wh movement is optional in syntax.

- (2) a. Who believes the claim that John saw what?  
 b. [<sub>CP</sub> who<sub>i</sub>(<sub>J</sub>) [<sub>IP</sub> t<sub>i</sub> believes [<sub>NP</sub> the claim that  
 John saw what(<sub>J</sub>) ]]]

In an LF structure like (2b), the moved wh phrase who controls the variable what through unselective binding in a non-local manner from outside the noun complement clause within which the variable resides. It is the kind of non-local binding between a moved element and its trace left behind by movement that the Subjacency constraint prohibits, but Subjacency is a condition on movement, and importantly, we claim that Wh movement is not involved in the scope assignment of wh-in-situ. Hence it can be stated that Subjacency has no bearing on the scope assigned to wh-in-situ.

In cases in which Wh movement is involved in LF, we have claimed that the machinery of LF pied piping gives us the effect of long distance movement of wh phrases. To be specific, in the case of Japanese-Sinhalese type languages, Wh movement is utilized in LF, but LF Wh movement, in most cases, exhibits no Subjacency effect, as exemplified in (3):

- (3) Taroo-wa [ John-ga donna-ronbun-o kai-ta toyuu ]  
 Taroo-TOP John-NOM what paper-ACC wrote that  
 uwasa-o kii-ta no?  
 rumor-ACC heard Q  
 'Taroo heard the rumor that John wrote what paper?'

In the treatment of a sentence like (3), we have proposed

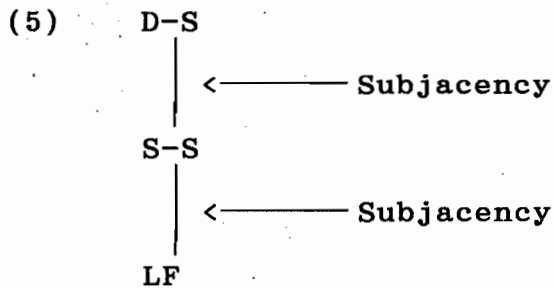
that the entire sequence of the noun complement is interpreted as a constituent that undergoes Wh movement, by virtue of the presence of a pied piping option, and as a consequence, the familiar rule of LF Wh fronting can raise the whole island to COMP, yielding a well-formed LF output:

(4) [<sub>CP</sub> [ John-ga donna-ronbun-o kai-ta toyuu ] uwasa-o<sub>i</sub> [<sub>IP</sub> Taroo-wa t<sub>i</sub> kii-ta ] no ]

The pied piping analysis analyzes the apparently unbounded relationship exhibited in (3) as a case of pied piping and as consisting of a local wh-binding connection which respects Subjacency. Since preposing of the whole island is not barred by the locality requirement, the irrelevance of bounding theory in (3) automatically falls out if Wh fronting is allowed to make reference to the entire sequence of strings forming an island.

Taken together, our discussion presented thus far reveals that the analyses delineated in this thesis can shed a new light on the 'boundedness' requirement on Wh movement. Whereas Chomsky (1986a) states, based on Huang's observation, that bounding theory that applies to the rule of move 'wh' is subject to parametric variation (among languages) depending on where the rule is instantiated, viz. in syntax or in LF, our theory asserts that Subjacency is not a matter of parametric variation, but remains fairly constant, irrespec-

tive of whether Wh movement is invoked in S-structure or in logical syntax, as in (5):



In the orthodox version of the Government and Binding theory, LF movement of a wh phrase is, in principle, unbounded without regard to Subjacency, but our analysis shows that LF Wh fronting is on the contrary constrained by Subjacency in quite a similar way as S-structure Wh movement, and that there is no asymmetry between S-structure and LF movements with regard to Subjacency.

The conventional analysis assumes that Subjacency is irrelevant for LF Wh movement, and results in a failure to capture the exact nature of wh scope. The theory developed in this thesis overcomes the shortcomings of previous studies based on this assumption and correctly accounts for the scope properties of wh phrases at no extra cost. Our theory is superior to the standard analysis, in the sense that our analysis not only serves to properly constrain the strong generative power of the move-alpha rule instantiated in the LF component, but also help us attain the correct understand-

ing of the scope properties of wh phrases.

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