SYNTACTIC AND NON-SYNTACTIC SCOPE

by

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Until recently, I was doubtful that it would ever be possible to study syntax (= the grammar). According to generative grammar, syntax is a study of mental representations, in particular, how they are generated, and feed into the other computational components of natural language, namely phonology and semantics. Most works on the syntax/semantics interface assume that all meanings associated with a given sentence, excluding presupposition, implicature, and metaphor, are generated directly through the compositional computation applied to an LF representation. Under this assumption, upon the discovery of an interpretation that cannot be accounted for by a given pair of existing syntactic and semantic theories, researchers typically seek a way to enrich either of the syntactic or semantic theory to accommodate the discovery. Such a practice appeared, and still appears to me, to be merely a sophisticated mental exercise, and it did not seem to be an activity to prove the existence of the grammar or to study its properties. In fact, nothing warrants that a given interpretation associated with a sentence is generated directly through LF compositional computation. In sum, I was left in darkness, wondering how we can convince ourselves of the existence of the grammar, and study its properties.

It was a series of Hajime Hoji's works that rescued me out of the darkness. His works convincingly demonstrate that if we pay attention to certain linguistic environments, the distribution of certain anaphoric relation, in particular what is normally called bound variable anaphora, is neatly described by c-command, a theoretical primitive (or a notion that is derivative of Merge, the operation that concatenates two elements) that has

to be adopted in any syntactic theory, but in some minimally different environments, the distribution remains idiosyncratic. It is also shown that a number of phenomena that are typical of syntax manifest only in the former environments. In other words, Hoji's works present two distinguished natural classes of linguistic environments, and only in one of them certain interpretations seem to reflect syntactic properties.

The work presented in this dissertation is inspired by Hoji's works. In fact, it aims to confirm Hoji's vision, so to speak, in the area of quantifier scope, and each chapter thereof points to one thesis that it is not always the case that a given scope interpretation emerges directly through LF compositional computation. Some critical readers may not accept what this thesis implies, namely, some scope interpretations are not solely based on LF compositional computation, especially because I only give speculative remarks as to how those interpretations come about. I however believe that this work convincingly demonstrate that there are two distinguished classes of scope interpretations, and only one of them reflects syntactic properties. I acknowledge that this work is merely the first step in my research project that aims to prove the existence of the grammar and study its property, and thus far from completion. But as the initial endeavor, I am happy about it.

Many people helped me complete this dissertation. First of all, I would like to thank my thesis committee members, Hajime Hoji, Barry Schein, Tim Stowell, Hagit Borer, and Audrey Li. As implied above, the works of Hajime inspired me to be a syntactician; hence, I owe my existence as a linguist to him. What he has done for me over the last seven years is beyond one's speech, and certainly beyond his duty as my academic advisor. He has spent countless amount of time discussing with me various linguistic issues. He has always been supportive; what he gave me was nothing but hope

and encouragement. I am also grateful that he has taught me a great deal how to present the materials.

I was privileged to discuss the contents of the dissertation weekly for an extended period of time with Barry and Tim. Barry's critical comments made me think how the materials should be presented and led me to reorganize the chapters a number of times. Barry was one of those who did not accept the implication from the main thesis that some scope interpretations are not solely based on LF compositional computation. He insisted that a version of event semantics might account for the relevant data. I regret that I cannot respond to his challenge in this work, as it is beyond its scope. Tim was always willing to understand my intuition, and gave me a number of constructive comments. I would also like to thank Barry and Tim for generously allowing me to consult them about English data. Hagit's comments always made me think what kinds of implications my works have for an overall picture of the grammar. It was Hagit who pointed out to me that my works suggest that covet movement is not part of the generative procedure of the grammar. I am thankful that Audrey drew my attention to how Chinese differs from Japanese and English regarding quantifier scope in several occasions. However, since I decided not to focus on parametric differences between languages in this work, I regretfully did not include Chinese data.

My special thanks go to Ayumi Ueyama, who entered the USC linguistics program together with me. When I stated the program, I had virtually no background in linguistics or any serious academic activities, and so I had no way to understand the insights contained in Hoji's works. It was after Ayumi's expounding of his works that I started sharing his vision. She met me weekly in the summer of 1996 to allow me to ask

questions regarding Hoji's works. Ayumi is therefore another person to whom I owe my existence as a linguist. Ayumi's dissertation titled *Two Types of Dependency*, which also confirms Hoji's view, influenced this work in a number of ways.

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of Pennsylvania in February 1999, *The 9ᵗʰ Japanese/Korean Linguistics Conference* at Ohio State University in August 1999, Osaka University in December 1999, Kyusyu University in December 1999, *Workshop on Empty Categories and Ellipsis* at Universidade Estadual De Campinas in August 2001, University of Southern California in October 2001, *Workshop on The Discrepancy Between Elided and Non-Elided Structures* at Kyoto University of Foreign Studies in December 2001, and *Workshop on Issues of Scope Interpretation from the Perspective of Syntax* at Kobe City University of Foreign Studies, organized by *the Kansai Linguistics Society*. I would like to thank the audiences there for their feedbacks.

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Appendix: On Some Current Proposals

Abstract

This dissertation demonstrates that it is not always the case that scope phenomena reflect the structural relation of c-command at LF, and establishes operational tests for teasing apart scope phenomena that are on the basis of LF properties from those that are not. It enables us to overcome (much of) the problem of judgmental fluctuation often observed in the discussion of scope phenomena in the literature, making it possible to seriously aspire to the attainment of repeatability in generative grammar, which has not been possible in the field for the principled reason that quite distinct types of phenomena have been conflated into one, not only in the area of scope phenomena but also in other areas having to do with interpretations.

Chapter 2 examines the scope interaction between a subject QP and an object QP in the configuration of [… QP_{Sub} [… QP_{Obj} …]], where the QP_{Sub} and the QP_{Obj} are clause-mates, and demonstrate that the inverse scope obtains only if three conditions are met, but the availability of the surface scope is not subject to such conditions. Chapter 3 argues that the surface scope may emerge on the basis of LF properties while the inverse scope does not, and that the latter requires both the QP_{Sub} and the QP_{Obj} to be in A-positions at LF while the former does not, supporting the view that a QP may or may not undergo covert movement. It is concluded that the inverse scope involves an extra-grammatical operation (= *MINOR*), and the characteristics of the inverse scope observed in Chapter 2 are attributed to MINOR.

Chapters 4-5 further confirm the conclusion reached in Chapter 3. Chapter 4 establishes independently one of the implications in Chapter 3 that a wide scope reading of a QP α over a QP β can emerge on the basis of LF properties only if α c-commands β prior

to covert movement (cf. Huang 1982). Chapter 5 presents further evidence for the two sources of scope interaction, based on the scope interaction between a QP and a *wh*-word. In particular, it is argued that functional reading may emerge through LF compositional computation while pair-list readings must be due to MINOR.

Chapter 1

Introduction

1.1. Objectives

One main goal of generative grammar is to discover a formal system that mediates sounds and meanings. A working hypothesis is that the formal system (= the grammar) concatenates elements selected from the lexicon of a given language, and yields as output the two representations, PF, which serves as the formal basis of sounds and LF, the formal basis of meanings. Under this hypothesis, it is crucial to investigate what representations the grammar can generate, and the relevant investigation often must rely on the intuition regarding what meanings a given sentence can be associated with.

In the context of this investigation, the scope interaction among *quantificational noun phrases* (= *QP*s) has been extensively discussed, and what is standardly assumed is (1).

(1)   All instances of scope interpretations emerge directly from the grammar, i.e., from LF compositional computation.

A working hypothesis is (2), which can be derived from (1), together with a certain assumption regarding the denotation of a given QP, namely, a QP is of type <et, t>, cf. Barwise & Cooper 1981.

(2)   Let S be a sentence whose configuration is [… α … β …], where α and β are QPs.

    a. α can take scope above β iff S is represented as (3a) at LF.

   b. α can take scope below β iff *S* is represented as (3b) at LF.

(3)   a. LF: [$_\Psi$ α [$_\Psi$ … β [$_\Psi$ … t$_\alpha$ … t$_\beta$ …]]]

   b. LF: [$_\Psi$ β [$_\Psi$ … α [$_\Psi$ … t$_\alpha$ … t$_\beta$ …]]]

Reported generalizations regarding the availability of scope interpretations, however, are not always uncontroversial, and particular theories/analyses are often built on different sets of acceptability judgments. An example of such a state of affair is found even in the very beginning of the generative enterprise. Chomsky 1957 and Katz & Postal 1964, for example, report different sets of judgments for the same two sentences, as indicated in the following passages.

> *We can describe circumstances in which a 'quantificational' sentence such as "everyone in the room knows at least two languages" may be true while the corresponding passive "at least two languages are known by everyone in the room" is false, under the normal interpretation of these sentences – e.g., if one person in the room knows only French and German, and another only Spanish and Italian. This indicates that not even the weakest semantic relation (factual equivalence) holds in general between active and passive. (Chomsky 1957, pp.100-101)*

> *Although the facts are far from clear, the active seems to be open to the same interpretation attributed to the passive, and conversely, the passive is open to the same interpretation attributed to the active. Both can mean either 'everyone in the room knows the same two particular languages, Persian and Hottentot' or 'everyone in the room knows two languages different for different people'. Thus it seems that both active and passives containing quantifiers and pronouns are ambiguous in the same way and so are full of paraphrases of each other. (Katz & Postal 1964, p.72)*

On the basis of their respective interpretations of the data, Chomsky (1957) claims that the active-to-passive transformation affects sentence interpretation, and Katz & Postal (1964) maintain the opposite.

What can we do when we encounter two (or more) conflicting generalizations? In the case of the conflict between Chomsky and Katz & Postal, the subsequent works have adopted the Katz & Postal generalization over the Chomsky one. The choice seems rea-

sonable as long as the assumption in (1) can be maintained. But can we really maintain (1)? I would like to think that the answer is not so obvious. Given (what seems to be a reasonable assumption) that human languages (more precisely the speaker's intuitions about a given sentence in a given context) can be sensitive to non-formal factors such as those having to do with pragmatics and discourse, the negative answer seems more natural. In fact, the main goal of this dissertation is to argue that (1) cannot be maintained.

Suppose that (1) cannot be maintained. Then, it is not clear a priori which of the conflicting generalizations must be adopted for a theory of the grammar. In the case of the conflict between Chomsky and Katz & Postal discussed above, for example, it may well be the case that the Chomsky generalization is relevant for the study of the grammar, but not the Katz & Postal one. It is therefore necessary to address the following question.

(4)   How can we ensure that a given scope interpretation in a given sentence

        emerges directly from the grammar i.e., from LF compositional computation?

The secondary objective this work aims to achieve is to identify the characteristics that distinguish scope interpretations that are generated directly from the grammar from those that are not.

In summary, by achieving the two objectives above, this dissertation aims to provide a key for resolving (much of) the problem of judgmental fluctuations often observed in the discussion of scope phenomena in the literature, making it possible to seriously aspire to the attainment of repeatability in the study of LF structural properties within generative grammar, which has not been possible in the field for the principled

reason that quite distinct types of phenomena have been conflated into one, not only in the area of quantifier scope but also in other areas having to do with interpretations.

1.2. Outline

The rest of the dissertation is organized as follows. In Chapters 2 and 3, the thesis in (1) is scrutinized. Chapter 2 presents a descriptive study regarding the scope interaction among QPs in the configuration of (5), where QP_{Sub} and QP_{Obj} stand for a subject QP and an object QP, respectively.

(5)   [… QP_{Sub} [… QP_{Obj} …]], where the QP_{Sub} and the QP_{Obj} are clause-mates

In particular, it demonstrates that the reading where the QP_{Sub} takes scope above the QP_{Obj} (= the surface scope) contrasts with that with the opposite scope order (= the inverse scope); the availability of the latter, as opposed to that of the former, is subject to a pragmatic condition, and furthermore, the latter imposes interpretive restriction on the QP_{Sub}, the QP taking narrow scope, as well as its clause-mate verbal negation if it exists. Based on these observations, I conclude with three conditions that are necessary for the inverse scope, but not for the surface scope.

Chapter 3 provides a theoretical characterization for the generalizations established in Chapter 2. It argues two-fold, on the basis of scope interaction in comparatives and Japanese scrambling constructions, that the surface scope may emerge based on the LF representation in (6a), but the inverse scope is not due to the LF representation in (6b).

(6)   (Ψ stands for an element that denotes a one-place predicate.)

    a. LF: $[_\Psi \, QP_{Sub} \, [_\Psi \, QP_{Obj} \, [_\Psi \, … \, t_{Sub} \, [\, … \, t_{Obj} \, … \,]]]]$

b. LF: $[_\Psi \text{QP}_\text{Obj} [_\Psi \text{QP}_\text{Sub} [_\Psi \ldots t_\text{Sub} [\ldots t_\text{Obj} \ldots]]]]$

Strikingly, one of the arguments indicates that the inverse scope can obtain only if both the QP_Sub and the QP_Obj are in an A-position, where an A-position is a theta position or the IP spec position, supporting the view that a QP may or may not undergo covert movement. Give the (reasonable) assumption that the inverse scope obtains in (5) through LF compositional computation only if (5) is represented as (6b) at LF, the two arguments in this chapter constitute evidence that the inverse scope does not emerge through LF compositional computation. Hence, (1) cannot be maintained. It follows that the inverse scope necessarily involves some extra-grammatical operation. And it is reasonable to attribute to the extra-grammatical operation (i) the three necessary conditions for the inverse scope (established in Chapter 2) and (ii) the generalization that the inverse scope can obtain only if both the QP_Sub and the QP_Obj are in an A-position. Once we acknowledge the two sources of the scope interaction among QPs, nothing prevents us from assuming that the surface scope may also involve the extra-grammatical operation. It is demonstrated that such is indeed the case. It turns out therefore that when the QP_Sub takes wide scope with respect to the QP_Obj in (5), the relevant LF representation may be either (7a) or (7b).

(7)   (Ψ stands for an element that denotes a one-place predicate.)

a. $[_\Psi \text{QP}_\text{Sub} [_\Psi \text{QP}_\text{Obj} [_\Psi \ldots t_\text{Sub} [\ldots t_\text{Obj} \ldots]]]]$

b. $[_\Psi \ldots \text{QP}_\text{Sub} [_\Psi \ldots \text{QP}_\text{Obj} \ldots]]$, where the QP_Sub and the QP_Obj are in an A-position

Chapters 4 and 5 further confirm the conclusion in Chapter 3 that there are two sources of scope interaction. The generalization that the surface scope may be based on

(6a), but the inverse scope is not due to (6b), entails that there is some independent principle that rules in (6a), but rules out (6b). And the isomorphism principle in (8) is one good candidate for such a principle, which is originally argued in Huang 1982, and in effect Hoji 1985.

(8)   Isomorphism Principle

When two noun phrases undergo covert movement, their c-command relation prior to the movement cannot be altered.

Chapter 4 establishes (8) on independent grounds. It demonstrates that (8) holds (i) between a referential expression and a QP, and (ii) between a QP and an NP with a 'focus-sensitive' particle, such as *only* and *even*.

Chapter 5 presents further evidence for the two sources of scope interaction, based on the scope interaction between a QP and a *wh*-word. In particular, it is argued that functional readings may emerge through LF compositional computation while pair-list readings must involve the extra-grammatical operation. It is demonstrated that in order for pair-list readings to obtain, the same conditions that are necessary for the inverse scope must be met, but the availability of functional readings is not subject to such conditions. For the last three decades, the field has addressed the question of whether or not pair-list readings can be analyzed as special instances of functional readings (cf. Engdahl 1986, Groenendijk & Stokhof 1984, May 1985, Chierchia 1993, Higginbotham 1991, and Szabolsci 1997a, among others). It turns out, however, that this very question is misguiding since the cognitive domain relevant for pair-list readings may not correspond to the domain that concerns functional readings.

In the recent tradition, the recognition of more than one scope-taking strategies is not uncommon, and one may thus wonder how the claims pursued in the previous chapters differ from those in other works. I therefore review in Appendix two of such works, namely Beghelli & Stowell 1997 and Reinhart 1997.

Chapter 2

Surface and Inverse Scope

2.1. Introduction

One of the main objectives in this dissertation is to scrutinize the thesis in (1), which is endorsed by the majority of researches that investigate the interface between syntax and semantics.

(1)   All instances of scope interpretations emerge directly from the grammar, i.e.,
        from LF compositional computation.

As the first step toward this end, this chapter provides a descriptive study of the scope interaction among *quantificational noun phrases* (= QPs) of the most basic kind, namely the scope interaction in the configuration of (2), where QP$_{Sub}$ and QP$_{Obj}$ stand for a subject QP and an object QP respectively. For convenience, the configuration in (2) will be referred to as *the basic order*.

(2)   [… QP$_{Sub}$ [… QP$_{Obj}$ …]], where the QP$_{Sub}$ and the QP$_{Obj}$ are clause-mates

If we confine our attention to cases like (3), the subject QP seems able to take either wide scope or narrow scope with respect to the object QP. (3), for example, can be taken to mean either (4a) or (4b).

(3)   More than two students visited three professors.

(4)   a. There are more than two *x*s, *x* is a student such that there are three *y*s, *y* is a
           professor such that *x* visited *y*.

       b. There are three *y*s, *y* is a professor such that there are more than two *x*s, *x* is a
           student such that *x* visited *y*.

This intuition is also truth-conditionally substantiated by the fact that (3) can be truth-fully uttered in the situation where three students each visited a different set of three professors and in the situation where three professors were each visited by a different set of three students. As we will observe in the following section, however, the option of the object QP taking scope above the subject QP is much more limited than that of the opposite scope order.

In the following discussion, I will refer to readings like the ones in (4) where one QP is within the scope of another QP as *wide scope readings*.[1] And among wide scope readings, those whose scope order corresponds to the surface linear order (e.g., (4a)) are called *surface scope readings*, and those whose scope order is reversed from the surface linear order *inverse scope readings* (e.g., (4b)). For convenience, I will abbreviate a wide scope reading where a QP β is within the scope of a QP α as *WSR<α, β>*.

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[1]   Although readings like (i-b) for (i-a) and (ii-b) for (ii-a) are often treated as instances of wide scope readings in the literature, it is not clear that they are such instances.

(i)   a. Three boys love some girl.
       b. There is some *y*, *y* is a girl such that there are three *x*s, *x* is a boy such that *x* loves *y*.

(ii)   a. Some girl loves three boys.
       b. There is some *x*, *x* is a girl such that there are three *y*s, *y* is a boy such that *x* loves *y*.

As pointed out correctly in Kuroda 1994, (i-b), for example, is truth-conditionally equivalent with the branching reading in (iii-a), where neither element takes wide scope with respect to the other, and similarly, (ii-b) cannot be truth-conditionally differentiated from (iii-b).

(iii) a. There is some *y*, *y* is a girl and there are three *x*s, *x* is a boy such that *x* loves *y*.
       b. There is some *x*, *x* is a girl and there are three *y*s, *y* is a boy such that *x* loves *y*.

To the extent that branching readings must be recognized independently from wide scope readings in a theory of the grammar, therefore, we cannot take readings like (i-b) and (ii-b) as evidence for the object QP or the subject QP takes scope above the other. For this reason, I will not use a singular-denoting QP as the potential wide-scope-taking element in the following discussion.

The empirical materials to be presented are from English and Japanese. In each relevant section, both English and Japanese materials are presented; however, the order of presentation may vary section to section for convenience.

2.2. Differences between surface and inverse scope readings

In this section, I will demonstrate that there are (at least) three linguistic conditions that are necessary for inverse scope readings to emerge, and the availability of surface scope readings is not subject to such conditions.

2.2.1. Specificity effects[2]

The study of quantifier scope in the generative tradition begins with the debate between Chomsky 1957 and Katz & Postal 1964, as briefly mentioned in Chapter 1. Since this debate, the generalization in (5) has served as the standard generalization regarding the scope interaction in the basic order for about three decades.

(5)   The basic order gives rise to both WSR$<$QP$_{Sub}$, QP$_{Obj}>$ and WSR$<$QP$_{Obj}$,

QP$_{Sub}>$.

In the 1990s, however, researchers extended the investigation to a wider range of the QP types, and concluded that inverse scope readings are not always available. Proposed generalizations differ from each other in regards to their classifications of QPs. Ruys (1992), Ben-Shalom (1993), and Beghelli & Stowell (1997), for example, maintain that WSR$<$QP$_{Obj}$, QP$_{Sub}>$ obtains in the basic order only if the QP$_{Obj}$ is a strong QP in the

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[2]   This section is based on Hayashishita 1999:Section 2, pp. 202-204 & Section 5.1, pp.211-213, and Hayashishita 2000a:Section 3.1, pp. 285-286 & Section 4.3.1, pp.291-293.

sense of Milsark 1974, 1977. A subset of strong QPs and that of weak QPs are listed

in (6) for your reference.

(6)   a. Strong QPs

        every boy, all boys, most boys, etc.

       b. Weak QPs

        some boy, many boys, four boys, more than four boys, less than four boys,

        exactly four boys, no boy, a certain boy, etc.

Liu (1990), on the other hand, maintains a less strict generalization. She claims

that WSR<QP_{Obj}, QP_{Sub}> obtains in the basic order only if the QP_{Obj} is a QP having [+

G-specfic], where the group characterized with [+ G-specific] includes strong QPs and

some weak QPs, as listed in (7).[3]

(7)   a. QPs with [+ G-specific]

        every boy, all boys, most boys, a certain boy, some boy, many boys, four boys,

        a majority of boys, two-third of the boys, etc.

       b. QPs with [- G-specific]

        more than four boys, less than four boys, exactly four boys, at least two boys,

        about ten boys, 10% of the boys, one-third of the boys, etc.

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[3]   In my opinion, the motivation for the G-specific feature is not clear. Regarding G-specificity, Liu
states only (i).

(i)   (= Liu 1990 (56), p.38)
           The branching reading is available if the NPs involved are G-specific.

Notice that G-specificity in (i) is defined in association with two elements. Thus, we are yet to see a
property of [+ G-specific] in regard to one element. Furthermore, (i), in and of itself, seems to have
no content. What is stated in (i) is one sufficient, but not necessary, condition for the branching read-
ing; thus, (i) does not exclude the possibility of a branching reading without involving a QP with [+
G-specific], and the distribution of branching readings cannot be accounted for.

I agree with the works in the 1990s that inverse scope readings are not always available in the basic order. I argue, however, that the distribution of inverse scope readings cannot be captured in terms of grammatical classifications of QPs, and the notion necessary for the generalization is *specificity*, a pragmatic notion.

First, consider the examples in (8) and (9).[4]

(8)   a. In the departmental election, [$_S$ more than 10 students] voted for [$_O$ two

        professors], but the other professors did not receive any vote.

    b. (Context: There are five bad-mannered students. You came to know the news
       that several professors split up into five groups and visited each of the students.
       Then, you spread the news.)

       [$_S$ Some professor] visited [$_O$ every bad-mannered student].

(9)   a. At USC, each year [$_S$ three selected professors] recommend [$_O$ more than five

        incoming students] for a fellowship award.

    b. In the coming workshop at USC, if [$_S$ two or more people] argue with [$_O$ more

        than 15% of the presenters], it will be considered a success.

Inverse scope readings can obtain in (8) but not (so easily) in (9). (8b), for example, can be true in the situation where each of the five bad-mannered students has received a visit from a different professor. However, (9a), for instance, cannot be uttered to describe the situation where each year, six incoming students are each recommended by a different set of three selected professors for a fellowship award.

The contrast we have just observed appears to render support to the Liu generalization above (but see FN 3). But we can also reasonably interpret the contrast under dis-

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[4]   *S* and *O* in italicized bold subscript stand for *subject* and *object*, and are used to mark the QPs whose scope interaction is under discussion.

cussion as indicating that WSR<QP$_{Obj}$, QP$_{Sub}$> obtains in the basic order only if the speaker refers to a specific group with the QP$_{Obj}$. (8a), for example, is a description of a past event of an election, and in a usual circumstance, the speaker is equipped with the information regarding who received votes and who did not. Similarly, (8b) is a report regarding the five bad-mannered students the speaker has in mind. The examples in (9), on the other hand, seem to be cases where the speaker does not refer to a specific group with the QP$_{Obj}$. (9a), for example, is a statement about a USC yearly activity, where the value of *more than five incoming students* changes annually. Similarly, (9b) is a description of a future event, and the value of *more than 15% of the presenters* is yet to be determined.

What is of interest to us is that the fact that inverse scope readings are not available in the examples in (9) cannot be attributed to the property of *more than five NP* or *more than 15% of the NP*. As illustrated in (10), when the context allows the speaker to associate specific groups with the relevant QPs, they can be understood as taking wide scope with respect to the subject QPs.

(10) a. (Context: We are wondering if we should rob some shops on 5th Avenue in New York. We agree that we will not execute the plan if more than five buildings on 5th Avenue are guarded. You go to spy, and see seven buildings guarded by two security guards each. You return and report the observation.)[5]

        Well, we should forget about the plan because [$_S$ two guards] were standing in front of [$_O$ more than five buildings].

  b. (Context: You are watching a film showing a court situation of the Roman Empire. In this period, for each court case, two witnesses are required. You

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[5]   I thank Maria Gallardo (p.c. May 1999) for the context just given and relevant discussion.

have seen in the film that 16 out of the 100 criminals were testified against. Then, you report what you have seen.)[6]

[$_S$ Two witnesses] testified against [$_O$ more than 15% of the criminals].

Hence, I reject the Liu generalization, and maintain that WSR<QP$_{Obj}$, QP$_{Sub}$> obtains in the basic order only if the speaker refers to a specific group with the QP$_{Obj}$.

Surface scope readings contrast with inverse scope readings. They seem to obtain whether or not the speaker refers to a specific group with the QP$_{Sub}$, as illustrated in (11) and (12).

(11) a. In the departmental election, [$_S$ two students] voted for [$_O$ more than three

professors], but other students did not vote for anyone.

b. [$_S$ Every automobile company in Japan] proposed a deal to [$_O$ three or more

insurance companies].

(12) a. At USC, each year [$_S$ many incoming students] nominate [$_O$ three professors]

for a teaching award.

b. In the coming workshop at USC, if [$_S$ more than 20% of the audience] argue

with [$_O$ two presenters], it will be considered a success.

In summary, the generalizations that correctly capture the distribution of wide scope readings in the basic order are:[7]

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[6] I thank Barry Schein (p.c. July 1999) for the context just given and relevant discussion.

[7] James Higginbotham (p.c. May 2002) pointed out to me that the generalizations in (13) do not cover embedded cases. For example, consider (i).

(i) (Context: George told you that he believes that certain two students have each been recom-mended by more than three professors. But you do not have a clue as to who the students are. So you simply report George's speech.)

George believes that [$_S$ more than three professors] have recommended [$_O$ two students].

(13)   a. WSR<QP$_{Obj}$, QP$_{Sub}$> obtains in the basic order only if the speaker refers to a

specific group with the QP$_{Obj}$.

b. WSR<QP$_{Sub}$, QP$_{Obj}$> obtains in the basic order even if the speaker does not

refer to a specific group with the QP$_{Sub}$.

Let us now turn to Japanese. The study of quantifier scope in Japanese starts with

the generalization that the basic order gives rise only to WSR<QP$_{Sub}$, QP$_{Obj}$> (cf. Kuroda

1969/70, Hoji 1985). Recently, however, a number of examples have been reported,

which illustrate that the basic order also yields WSR<QP$_{Obj}$, QP$_{Sub}$> (e.g., Kitagawa

1990, Kuroda 1994, Kuno et al 1999). In particular, Kitagawa (1990) argues against Ku-

roda (1969/70) and Hoji (1985), and maintains that the basic order is associated with

both surface and inverse scope readings.[8]

In (i), the speaker reports George's speech. George refers to specific two students in his speech, but crucially, the speaker does not know who the students are. Yet, *two students* can be understood as taking wide scope with respect to *more than three professors* within the embedded clause.

    The generalization that covers both non-embedded cases and embedded cases seems to be (ii).

(ii)   Let S_1, S_2, S_3, ..., S_n be persons, where n is the largest number.
           In the situation where S_1 reports a speech of S_2, who in turn reports a speech of S_3, who in
           turn reports a speech of S_4, ... a speech of S_n, and S_n's speech has a form of [... QP$_{Sub}$ [
           ... QP$_{Obj}$ ...]], where the QP$_{Sub}$ and the QP$_{Obj}$ are clause-mate, WSR<QP$_{Obj}$, QP$_{Sub}$> may ob-
           tain in the lowest clause as long as the QP$_{Obj}$ is taken as a referring to a group specific with
           respect to S_k, where k = n or k<n.

    In thpe following discussion, I will suppress this problem, and continue to use the generalization in (13) in order to present the subsequent discussion in a simpler way. The suppression of this prob-lem does not affect any of the claims I will be making.

[8]   Incidentally, Kitagawa (1990) reports that WSR<QP$_{Obj}$, QP$_{Sub}$> is available in the basic order only marginally. One may thus argue that he does not challenge the Kuroda/Hoji generalization. He attributes, however, the marginality to a non-syntactic reason (due to the PF/LF mismatch (p.28)), and proposes the grammar that generates WSR<QP$_{Sub}$, QP$_{Obj}$> and WSR<QP$_{Obj}$, QP$_{Sub}$> on a par with each other. I therefore understand Kitagawa's generalization to be that the basic order yields both surface and inverse scope readings, as far as the grammar is concerned.

I maintain that (i) WSR<QP_{Obj}, QP_{Sub}> may obtain in the basic order, but (ii) only when a certain condition is met; I thus reject both (i) the Kuroda/Hoji generalization and (ii) Kitagawa generalization. In particular, I argue that the generalizations in (13) hold also for Japanese.[9] In what follows, I will illustrate the generalizations in (13) on the basis of Japanese examples. Readers who are not interested in empirical materials in Japanese might skip to the beginning of Section 2.2.

First, observe that inverse scope readings can obtain in the examples in (14), but not in those in (15). We can take this contrast as indicating that WSR<QP_{Obj}, QP_{Sub}> obtains in the basic order only if the speaker refers to a specific group with the QP_{Obj}.

(14) a. Gakubunaisenkyo-de, [$_S$ 10ninizyoo-no gakusei]-ga [$_O$ hutari-no kyoozyu]-ni
        department:election-at   10:more-GEN   student-NOM   two-GEN professor-DAT

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[9]   Incidentally, Kuroda (1994) puts forth the generalization in (i)

(i)   WSR<QP_{Obj}, QP_{Sub}> obtains in the basic order only if the verb is an event verb.

In support of the generalization, he assumes that the verb, *mensetusita* 'interviewed', in (ii-a) is an event verb while the verb, *sitteiru* 'know', in (ii-b) is not, and maintains that (ii-a) can give rise to the inverse scope reading while (ii-b) cannot.

(ii)   a.   (= Kuroda 1994 (63), slightly adapted)
            [$_S$ Tanaka sensei ka Yamada sensei]-ga [$_O$ gonin-no sigansya]-o   mensetusita.
              Tanaka teacher or Yamada teacher-NOM   five-GEN applicant-ACC interviewed
            '[$_S$ Prof. Tanaka or Prof. Yamada] interviewed [$_O$ five applicants].'

       b.   (= Kuroda 1994 (65), slightly adapted)
            [$_S$ Tanaka sensei ka Yamada sensei]-ga [$_O$ gonin-no sigansya]-o   sitteiru.
              Tanaka teacher or Yamada teacher-NOM   five-GEN applicant-ACC is:knowing
            '[$_S$ Prof. Tanaka or Prof. Yamada] know [$_O$ five applicants].'

   I, however, contend that his generalization is invalid. In fact, it is not difficult to construct counterexamples to (i). For instance, the sentences in (iii), where the verbs cannot be considered as event verbs, can give rise to inverse scope readings.

(iii) a. [$_S$ Sukunakutomo sannin-no gakusei]-ga [$_O$ subete-no sensei]-o   nikundeiru.
              at:least   three-GEN student-NOM   all-GEN   teacher-ACC is:hating
            '[$_S$ At least three students] hate [$_O$ every teacher].'

       b. [$_S$ Sukunakutomo sannin-no gakusei]-ga [$_O$ rei-no   hutari-no sensyu]-ni akogareteiru.
              at:least   three-GEN student-NOM   the-GEN two-GEN athlete-DAT is:admiring
            '[$_S$ At least three students] admire [$_O$ the two athletes].'

toohyoosita. Demo hoka-no   kyoozyu-ni-wa   daremo toohyoosi-na-katta.
voted   but   other-GEN professor-DAT-TOP no:one vote-not-PAST

'In the departmental election, [$_S$ 10 or more students] voted for [$_O$ two professors]. But for the other professors, no one voted.'

b. (Context: There are five bad-mannered students. You know the fact that several professors split up into five groups and went to visit each of the students. You describe your knowledge as follows.)

[$_S$ Sukunakutomo dareka]-ga   [$_O$ subete-no huryoo   gakusei]-o
   at:least   someone-NOM   all-GEN   bad-mannered student-ACC

hoomonsita.
visited

'[$_S$ At least someone] visited [$_O$ every bad-mannered student].'

(15) a. USC-de-wa maitosi   [$_S$ sannin-no kyoozyu]-ga   [$_O$ goninizyoo-no
          USC-at-TOP every:year   three-GEN professor-NOM   five:more-GEN

sinnyuusei]-o   zinbunkagakusyoo-ni suisensuru.
new:student-ACC humanity:award-DAT   recommend

'In USC, each year [$_S$ three professors] recommend [$_O$ five or more incoming students] for the humanity award.'

b. Kondo-no   gakkai-wa,   mosi [$_S$ hutariizyoo-no hito]-ga
    coming-GEN   conference-TOP if   two:more-GEN person-NOM

[$_O$ takusan-no happyoosya]-ni giron-o   sikaketa ra, seikoo to   siyoo.
    many-GEN   presenter-DAT   argument-ACC initiated if   success that suppose

'In the coming conference, if [$_S$ two or more persons] argue with [$_O$ many presenters], let us consider the conference to be a success.'

Because the examples in (16) allow inverse scope readings, we cannot attribute the absence of the inverse scope readings in (15) to the properties of *goninizyoo-no NP* 'five or more NP' and *takusan-no NP* 'many NP'.

(16) a. (Context: We are wondering if we should rob some shops on 5th Avenue in New York. We agree that we will not execute the plan if five or more

buildings on 5th Avenue are guarded. You go to spy, and see seven buildings guarded by two security guards. You return and report your observation.)

Dame-da. [_S Hutari-no gaadoman]-ga [_O itutuizyoo-no biru]-no mae-ni
bad-COPULA two-GEN guard-NOM five:more-GEN building-GEN front-DAT

tatteita.
was:standing

'We got a bad luck. [_S Two guards] were standing in front of [_O five or more buildings].'

b. (Context: You are watching a film showing a court situation of the Roman Empire. In this period, for each court case, two witnesses are required. You have seen that 55 out of the 100 criminals (in the film) were testified against. Then, you report what you have seen.)

[_S Hutari-no syoonin]-ga [_O takusan-no yoogisya]-ni hurina
 two-GEN witness-NOM many-GEN criminal-DAT disadvantageous

syoogen-o dasiteita.
testimony-ACC was:reporting

'[_S Two witnesses] testified against [_O many criminals].'

As in the case of English, surface scope readings contrast with inverse scope readings. WSR<QP_{Sub}, QP_{Obj}> obtains in the basic order whether or not the speaker refers to a specific group with the QP_{Sub}, as illustrated in (17)-(18).

(17) a. [_S Toyota to Nissan]-ga [_O mittuizyoo-no hokengaisya]-ni   keiyaku-o
    Toyota and Nissan-NOM three:more-GEN insurance:company-DAT contract-ACC

   moosikonda to siyoo.
   requested that suppose

   'Suppose that [_S Toyota and Nissan] proposed a deal to [_O three or more insurance companies].'

  b. (Context: You know the fact that Student A and Student B voted for four professors. You describe your knowledge as follows.)

   Gakubunaisenkyo-de, [_S hutari-no gakusei]-ga [_O sanninizyoo-no kyoozyu]-ni
   department:election-at two-GEN student-NOM three:more-GEN professor-DAT

toohyoosita.
voted

'In the departmental election, [_S two students] voted for [_O three or more professors].'

(18) a. USC-de-wa, maitosi [_S takusan-no sinnyuusei]-ga [_O gonin-no kyoozyu]-o
         USC-at-TOP every:year many-GEN new:student-NOM   five-GEN professor-ACC

         zinbunkagakusyoo-ni suisensuru.
         humanity:award-DAT   recommend

         'In USC, each year [_S many incoming students] recommend [_O five professors] for the humanity award.'

      b. Kondo-no   gakkai-wa,   mosi [_S 20%izyoo-no   happyoosya]-ga
         coming-GEN conference-TOP, if   20%:more-GEN presenter-NOM

         [_O hutari-no tyoosyuu]-ni giron-o   sikaketa ra, seikoo to siyoo.
            two-GEN audience-DAT argument-ACC initiated if   success that suppose

         'In the coming conference, if [_S 20% or more of the presenters] argue with [_O two people in the audience], let us consider it to be a success.'

We have thus observed that the generalizations in (13), repeated here, hold for both English and Japanese.[10]

(13) a. WSR<QP_{Obj}, QP_{Sub}> obtains in the basic order only if the speaker refers to a specific group with the QP_{Obj}.

      b. WSR<QP_{Sub}, QP_{Obj}> obtains in the basic order even if the speaker does not refer to a specific group with the QP_{Sub}.

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[10]   But see FN 7.

2.2.2. Freezing effects[11]

In this subsection, I will provide two-fold demonstration that while inverse scope readings induce a certain interpretive restriction on the QP taking narrow scope, surface scope readings do not.

2.2.2.1. Freezing effects on scope

The first set of generalizations I will put forth is:

(19)   a. When WSR<QP_{Obj}, QP_{Sub}> obtains in the basic order, the narrow scope taking

QP, the QP_{Sub}, cannot take wide scope with respect to another QP.

b. When WSR<QP_{Sub}, QP_{Obj}> obtains in the basic order, the narrow scope taking

QP, the QP_{Obj}, can still take wide scope with respect to another QP.

In order to demonstrate that (19a) holds, let us first consider the following example.

(20)   [$_S$ Sanninizyoo-no kyoozyu]-ga [$_O$ rei-no   hutari-no gakusei]-o   kaisya-ni
                three:more-GEN professor-NOM that-GEN two-GEN student-ACC company-DAT

suisensiteita.
was:recommending

'[$_S$ Three or more professors] recommended [$_O$ the two students] to companies.'

The sentence in (20) allows the direct object QP to take scope above the subject QP. This is not surprising since we can reasonably assume that the speaker refers to a specific group with *rei-no hutari-no gakusei* 'the two students' at the speech time.

Next, confirm the availability of the wide scope reading of the subject QP over the indirect object QP in (21).

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[11]   Similar empirical materials are also found in Hayashishita 1999:Section 5.2, pp. 213-215 and Hayashishita 2000a:Section 3.2, pp. 286-288.

(21)   [$_S$ Sanninizyoo-no kyoozyu]-ga   John-o [$_O$ hutatu-no kaisya]-ni
         three:more-GEN professor-NOM John-ACC   two-GEN   company-DAT

suisensiteita.
was:recommending

'[$_S$ Three or more professors] recommended John to [$_O$ two companies].'

What is of interest is that the two instances of wide scope readings, which we have just observed in isolation, cannot obtain simultaneously. This is illustrated in (22).

(22)   [$_S$ Sanninizyoo-no kyoozyu]-ga [$_O$ rei-no   hutari-no gakusei]-o [$_O$ hutatu-no
         three:more-GEN professor-NOM   the-GEN two-GEN student-ACC   two-GEN

kaisya]-ni   suisensiteita.
company-DAT was:recommending

'[$_S$ Three or more professors] recommended [$_O$ the two students] to [$_O$ two companies].'

In (22), when the direct object QP scopes above the subject QP, the subject QP cannot

take wide scope with respect to the indirect object QP, and conversely, when the subject

QP scopes above the indirect object QP, the direct object QP cannot take wide scope

with respect to the subject QP. The unavailable reading under discussion is expressed

as (23) with logical formulas.[12]

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[12]   This is a very rough translation of the reading under discussion. The uniqueness presupposition implied by *rei-no hutari-no gakusei* 'the two students', for example, is ignored. This simplification, however, does not affect the point here, for (23) is entailed by the more accurate translation that includes the uniqueness presupposition.

In what follows, when a translation with logical formulas seems necessary for a given reading, I will provide a rough translation to achieve a simpler presentation, as long as the point of discussion is not obscured.

(23) $\exists Y\ (Y \subseteq student \wedge |Y| = 2)\ \forall y\ (y \in Y)\ [\exists X\ (X \subseteq professor \wedge |X| \geq 3)$

$\forall x\ (x \in X)\ [\exists Z\ (Z \subseteq company \wedge |Z| = 2)\ \forall z\ (z \in Z)\ [x\ recommended\ y\ to$

z]]]

To substantiate the absence of this reading, the situation in (24) may be considered. If (22) were taken to mean (23), it should be true in (24). However, the fact is on the contrary.

(24)   Elena and Victoria are the students under discussion.

For Elena, Professor A recommended her to Companies 1 & 2, Professor B to

Companies 2 & 3, and Professor C to Companies 3 & 4.

For Victoria, Professor D recommended her to Companies 4 & 5, Professor E

to Companies 5 & 6, Professor F to Companies 6 & 7, and Professor G to

Companies 7 & 8.

When the direct object QP takes scope above the subject QP in (22), the available reading seems to be only (25), where the subject QP does not take wide scope or narrow scope with respect to the indirect object QP.[13]

(25) $\exists Y\ (Y \subseteq student \wedge |Y| = 2)\ \forall y\ (y \in Y)\ [\exists X\ (X \subseteq professor \wedge |X| \geq 3)$

$\exists Z\ (Z \subseteq company \wedge |Z| = 2)\ [\forall x\ (x \in X)\ \exists z\ (z \in Z)\ [x\ recommended\ y\ to\ z]$

$\wedge\ \forall z\ (z \in Z)\ \exists x\ (x \in X)\ [x\ recommended\ y\ to\ z]]]$

This intuition is supported by the fact that (22) can be truthfully uttered in the situation of (26), where the number of companies to which each of the students under discussion is recommended is two.

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[13]   I owe Daisuke Bekki (p.c. December 1998) for this formalism.

(26)   Elena and Victoria are the students under discussion.

For Elena, Professor A recommended her to Companies 1 & 2, Professor B, to

Company 2, and Professor C, to Company 1.

For Victoria, Professor D recommended her to Companies 3 & 4, Professor E

to Company 3, Professor F to Company 4, and Professor G to Companies 3 &

4.

Altering the linear order between the direct object and the indirect object in (22) as

in (27) does not change the factual assessment. Like (22), (27) can be used to express

the reading in (25), but not that in (23); i.e., it can be truthfully uttered in (26), but not in

(24).

(27)   [_S Sanninizyoo-no kyoozyu]-ga [_O hutatu-no kaisya]-ni   [_O rei-no   hutari-no
             three:more-GEN professor-NOM two-GEN   company-DAT the-GEN two-GEN

gakusei]-o   suisensiteita.
student-ACC   recommended

'(Lit.) [_S Three or more professors] recommended to [_O two companies] [_O the
two students].'

The fact that (22) and (27) cannot give rise to (23) should not be dismissed since

the reading itself is possible in another minimally different construction. For example,

(28), the *niyotte*-passive counterpart of (22) and (27), can yield the reading under discus-

sion, i.e., it can be truthfully uttered in (24).

(28)   [_O Rei-no hutari-no gakusei]-ga [_S sanninizyoo-no kyoozyu]-niyotte
             the-GEN two-GEN student-NOM   three:more-GEN professor-by

[_O hutatu-no kaisya]-ni   suisens-are-ta.
     two-GEN   company-DAT recommend-PASSIVE-PAST

'[$_O$ The two students] were recommended by [$_S$ three or more professors] to [$_O$ two companies].'

My interpretation of the fact regarding (22) and (27) is as follows. When WSR<QP$_{Obj}$, QP$_{Sub}$> obtains in the basic order, some interpretive restriction is imposed on the QP$_{Sub}$ such that it cannot take wide scope with respect to another QP. In the following discussion, I refer to those phenomena where a QP that is able to take wide scope with respect to another QP in one context but is unable to do so in another context as *freezing effects on scope*.

A few more examples are supplied in (29) to further illustrate the generalization under discussion. In these examples, when the indirect object takes scope above the subject, the subject cannot take wide scope with respect to the direct object.

(29) a. [$_S$ Sanninizyoo-no heddohantaa]-ga [$_O$ hutatu-no kaisya]-o   [$_O$ subete-no
         three:more-GEN headhunter-NOM   two-GEN company-ACC all-GEN

   gakusei]-ni syookaisiteita.
   student-DAT introduced

   '[$_S$ Three or more headhunters] introduced [$_O$ two companies] to [$_O$ every students].'

 b. [$_S$ Sanninizyoo-no heddohantaa]-ga [$_O$ subete-no gakusei]-ni [$_O$ hutatu-no
       three:more-GEN headhunter-NOM   all-GEN   student-DAT   two-GEN

   kaisya]-o   syookaisiteita.
   company-ACC introduced

   '(Lit.) [$_S$ Three or more headhunters] introduced to [$_O$ every students] [$_O$ two companies].'

Freezing effects on scope can also be observed in English. In the examples in (30), for instances, the wide scope reading of the direct object QP over the subject QP cannot co-occur with the wide scope reading of the subject QP over the indirect object QP. Similarly, in the examples in (31), the wide scope reading of the indirect object QP

over the subject QP cannot co-occur with the wide scope reading of the subject QP over the direct object QP.

(30) a. [$_S$ Many professors] recommended [$_O$ the two students under discussion] to [$_O$ three companies].

   b. [$_S$ More than three professors] introduced [$_O$ every student] to [$_O$ two scholars].

(31) a. [$_S$ Many professors] recommended [$_O$ three companies] to [$_O$ the two students under discussion].

   b. [$_S$ More than three professors] introduced [$_O$ two scholars] to [$_O$ every student].

Let us now turn to the generalization in (19b). Given the observation in Section 2.2.1 that the availability of surface scope readings is not limited in the way that of inverse scope readings is, one might suspect that when WSR<QP$_{Sub}$, QP$_{Obj}$> obtains in the basic order, freezing effects on scope would not be induced. Such is indeed the case.

First, observe that the subject QP can take scope above the indirect object QP in (32a) and the indirect object QP can take wide scope with respect to the direct object QP in (32b).

(32) a. Maitosi [$_S$ takusan-no kyoozyu]-ga [$_O$ gonin-no gakusei]-ni Toyota-o
      every:year many-GEN professor-NOM five-GEN student-DAT Toyota-ACC

      suisensuru.
      recommend

      'Each year, [$_S$ many professors] recommend Toyota to [$_O$ five students].'

   b. Maitosi Kimura kyoozyu-ga [$_O$ gonin-no gakusei]-ni [$_O$ hutatuizyoo-no
      every:year Kimura professor-NOM five-GEN student-DAT   two:more-GEN

      kaisya]-o   suisensuru.
      company-ACC recommend

'Each year, Prof. Kimura recommend [$_O$ two or more companies] to [$_O$ five students].'

Furthermore, the two instances of wide scope readings can occur simultaneously, as illustrated in (33). A translation of the reading under discussion is provided in (34) for convenience.

(33)   Maitosi [$_S$ takusan-no kyoozyu]-ga [$_O$ gonin-no gakusei]-ni [$_O$ hutatuizyoo-no
        every:year many-GEN   professor-NOM   five-GEN student-DAT   two:more-GEN

        kaisya]-o   suisensuru.
        company-ACC recommend

        'Each year, [$_S$ many professors] recommend [$_O$ two or more companies] to [$_O$
        five students].'

(34) $\exists X\ (X \subseteq professor \wedge |X| \geq k)\ \forall x\ (x \in X)\ [\exists Y\ (Y \subseteq student \wedge |Y| = 5)$

        $\forall y\ (y \in Y)\ [\exists Z\ (Z \subseteq company \wedge |Z| \geq 2)\ \forall z\ (z \in Z)\ [x\ recommends\ z\ to\ y$

        ]]], where k is an integer considered to be large in a given context.

The generalization under discussion seems to hold with other types of QPs. Here I supply two more examples for further illustrations.   The examples in (35) allow the wide scope reading of the subject QP over the indirect object QP to co-occur with the wide scope reading of the indirect object QP over the direct object QP.

(35)   a. [$_S$ Kimura kyoozyu to Yamada kyoozyu]-ga [$_O$ sanninizyoo-no gakusei]-ni
            Kimura professor and Yamada professor-NOM   three:more-GEN student-DAT

            [$_O$ yottu-no kaisya]-o   syookaisiteita.
            four-GEN company-ACC introduced

            '[$_S$ Prof. Kimura and Prof. Yamada] introduced [$_O$ four companies] to [$_O$ three or
            more students].'

        b. Maitosi, [$_S$ hutariizyoo-no kyoozyu]-ga [$_O$ sannin-no gakusei]-ni
            every:year two:more-GEN professor-NOM   three-GEN student-DAT

      [$_O$ gosatuizyoo-no hon]-o   susumeru.
          five:more-GEN   book-ACC recommend

'Each year, [$_S$ two or more professors] recommend [$_O$ five or more books] to [$_O$ three students].'

The generalization in (19b) seems to be valid also in English. In the following examples, for instance, the subject QP can take scope above the direct object QP, which in turn can take scope above the indirect object QP.

(36)   a.   [$_S$ Every professor] introduced [$_O$ more than three people] to [$_O$ four companies].

     b.   Every year, [$_S$ two newly hired professors] recommend [$_O$ more than three books] to [$_O$ five students].

In summary, we have observed in this subsection that the generalizations in (19), repeated here, hold in both Japanese and English.

(19)   a.   When WSR<QP$_{Obj}$, QP$_{Sub}$> obtains in the basic order, the narrow scope taking QP, the QP$_{Sub}$, cannot take wide scope with respect to another QP.

     b.   When WSR<QP$_{Sub}$, QP$_{Obj}$> obtains in the basic order, the narrow scope taking QP, the QP$_{Obj}$, can still take wide scope with respect to another QP.

2.2.2.2. Freezing effects on binding

In the previous subsection, I have maintained that inverse scope readings impose some interpretive restriction on the QP taking narrow scope, while surface scope readings do not. This subsection further supports this conclusion. In particular, I argue that the generalizations in (37) hold.

(37)   a.   When WSR<QP$_{Obj}$, QP$_{Sub}$> obtains in the basic order, the narrow scope taking QP, the QP$_{Sub}$, cannot bind a dependent term.

b. When WSR<QP$_{Sub}$, QP$_{Obj}$> obtains in the basic order, the narrow scope

   taking QP, the QP$_{Obj}$, can still bind a dependent term.

In order to illustrate (37a), let us first observe that the sentence in (38) allows the

direct object QP to take scope above the subject QP.

(38)   [$_S$ Mittuizyoo-no ginkoo]-ga [$_O$ rei-no hutatu-no kaisya]-o   torihikisaki-ni
              three:more-GEN bank-NOM   the-GEN two-GEN company-ACC customer-DAT

         syookaisita to   siyoo.
         introduced   that suppose

         'Suppose that [$_S$ three or more banks] introduced [$_O$ the two companies] to
         customers.'

Second, confirm that bound variable anaphora can be established between *mit-*

tuizyoo-no ginkoo 'three or more banks' and *soko* 'it' in (39);[14] i.e., (39) can be used to

express the proposition that there are three or more banks such that each of the banks

introduced Toyota to its customer.

(39)   [$_S$ Mittuizyoo-no ginkoo]-ga Toytota-o   soko-no   torihikisaki-ni
              three:more-GEN bank-NOM   Toyota-ACC that:place-GEN customer-DAT

         syookaisita to   siyoo.
         introduced that suppose

         '(Lit.) Suppose that [$_S$ three or more banks] introduced Toyota to its customer.'

Note that the anaphoric relation under discussion cannot be that of co-reference since

soko 'it' is singular-denoting, and *mittuizyoo-no ginkoo* 'three or more banks' is not.[15] In

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[14]   (Intended) bound variable anaphora will be indicated with the use of underlines.

[15]   It is argued in Hoji 1998a that *soko* 'it' is singular-denoting on the basis of its incapability of co-referring to split antecedents. He argues that the contrast between (i) and (ii), for example, can be accounted for under the assumption that *soko* 'it' in (i-a)-(i-b) is singular-denoting, while *karera* 'them' and *aitura* 'them' in (ii-a) and (ii-b) are not.

(i)   (= Hoji 1998a (3), p.652, slightly adapted)

the following discussion, in order to ensure that the anaphoric relation between a QP α

and an NP β is not that of co-reference but that of bound variable anaphora, I will utilize

for α an element that is not singular-denoting, and for β an element that is singular-

denoting.[16]

What is of interest is that the instances of wide scope reading and bound variable

anaphora, which we have observed in isolation, cannot obtain simultaneously, as the fol-

lowing example illustrates.

(40)   [$_S$ Mittuizyoo-no ginkoo]-ga [$_O$ rei-no hutatu-no kaisya]-o   soko-no
          three:more-GEN bank-NOM   the-GEN two-GEN company-ACC that:place-GEN

torihikisaki-ni syookaisita to   siyoo.
customer-DAT introduced that suppose

'(Lit.) Suppose that [$_S$ three or more banks] introduced [$_O$ the two companies] to
its customer.'

---

a. *Toyota$_1$-ga Nissan$_2$-ni [$_{IP}$ zeimusyo-ga   soko$_{1+2}$-o   sirabeteiru]   to tugeta (koto)
     Toyota-NOM Nissan-DAT   tax:office-NOM that:place-ACC is:investigating that told   that
     'Toyota$_1$ told Nissan$_2$ that the tax office was investigating them$_{1+2}$.'

b. *Toyota$_1$-wa Nissan$_2$-ni soko$_{1+2}$-no   goodoo paatii-no kaizyoo-o teiansita.
     Toyota-TOP Nissan-DAT that:place-GEN joint   party-GEN place-ACC suggested
     'Toyota$_1$ suggested to Nissan$_2$ a place for their$_{1+2}$ joint party.'

(ii)   (= Hoji 1998a (2a)-(2b), pp.650-651, slightly adapted)

a   Tom$_1$-ga Nick$_2$-ni [$_{IP}$ CIA-ga   karera$_{1+2}$-o sirabeteiru]   to tugeta (koto)
    Tom-NOM Nick-DAT   CIA-NOM them-ACC is:investigating that told   that
    'Tom$_1$ told Nick$_2$ that the CIA was investigating them$_{1+2}$.'

b. Ano ninensei$_1$-wa   ano itinensei$_2$-ni aitura$_{1+2}$-no atarasii kooti-o   syokaisita.
    that sophomore-TOP that freshman-DAT them-GEN   new   coach-ACC introduced
    'That sophomore$_1$ introduced to that freshman$_2$ their$_{1+2}$ new coach.'

[16]   See Hoji 2003:Section 2.2.2.1 for the demonstration that the judgmental fluctuation of the
speaker's intuition regarding the (un)availability of bound variable anaphora is smaller in the case
where a given anaphoric relation is between a non-singular-denoting element and a singular-denoting
element than in the case where the anaphoric relation is between two singular-denoting or two non-
singular-denoting elements.

In (40), when the wide scope reading of the direct object QP over the subject QP obtains, the subject QP cannot bind the dependent term, *soko* 'it', and conversely, when the subject QP binds *soko* 'it', the inverse scope reading fails to obtain. The unavailable reading under discussion is expressed as (41), using logical formulas.

(41) $\exists Y$ $(Y \subseteq company \wedge |Y| = 2)$ $\forall y$ $(y \in Y)$ $[\exists X$ $(X \subseteq bank \wedge |X| \geq 3)$

         $\forall x$ $(x \in X)$ [x introduced y to x's customer]]

To substantiate the intuition truth-conditionally, we may consider the situation in (42). If (40) were understood to mean (41), it should be true in (42); however, the fact is on the contrary.

(42)   Toyota and Nissan are the two companies under discussion. There are seven

         banks, A, B, C, D, E, F, and G. For Toyota, A introduced it to A's customer, B

         to B's customer, C to C's customer, and D to D's customer. For Nissan, E

         introduced it to E's customer, F to F's customer, and G to G's customer.

As the alternation of the linear order between the direct and indirect objects did not eliminate freezing effects on scope in Section 2.2.1, the change of the linear order as in (43) does not alter the factual assessment; like (40), (43) cannot give rise to the reading in (41).

(43)   [$_S$ Mittuizyoo-no ginkoo]-ga soko-no   torihikisaki-ni [$_O$ rei-no   hutatu-no
           three:more-GEN bank-NOM that:place-GEN customer-DAT   the-GEN two-GEN

         kaisya]-o   syookaisita to siyoo.
         company-ACC introduced   that suppose

         '(Lit.) Suppose that [$_S$ three or more banks] introduced to its customer [$_O$ the two
         companies].'

The fact that (40) and (43) cannot give rise to the reading in (42) is noteworthy,

since (44), their *niyotte*-passive counterpart, allows the reading under discussion.

(44)   [$_O$ Rei-no hutatu-no kaisya]-ga   [$_S$ mittuizyoo-no ginkoo]-niyotte
          the-GEN two-GEN company-NOM   three:more-GEN bank-by

        soko-no   torihikisaki-ni syookais-are-ta   to siyoo.
        that:place-GEN customer-DAT   introduce-PASSIVE-PAST that suppose

        '(Lit.) Suppose that [$_O$ the two companies] were introduced by [$_S$ three or more banks] to its customer.'

And I take this fact as indicating that when WSR<QP$_{Obj}$, QP$_{Sub}$> obtains in the basic or-

der, an interpretive restriction is imposed on the QP$_{Sub}$ such that it cannot be interpreted

as binding a dependent term. Let us refer to phenomena where a QP that can be inter-

preted as binding a dependent term in one context is unable to do so in another context

as *freezing effects on binding*.

The following examples further illustrate the generalization under discussion, in

which the wide scope reading of the indirect object QP over the subject QP cannot co-

occur with the subject QP binding *soko* 'it.'

(45) a. Tyoosa-ni yoruto,   [$_S$ itutuizyoo-no kaisya]-ga   [$_O$ subete-no bengosi]-ni
          survey-DAT according:to five:more-GEN company-NOM   all-GEN   attorney-DAT

         soko-no   mondai-o   motikaketeita.
         that:place-GEN problem-ACC brought

         '(Lit.) According to a survey, [$_S$ five or more companies] brought to [$_O$ every attorney] its problem.'

      b. Tyoosa-ni yoruto,   [$_S$ itutuizyoo-no kaisya]-ga   soko-no
          survey-DAT according:to five:more-GEN company-NOM that:place-GEN

         mondai-o [$_O$ subete-no bengosi]-ni   motikaketeita.
         problem-ACC all-GEN   attorney-DAT brought

         '(Lit.) According to a survey, [$_S$ five or more companies] brought its problem to [$_O$ every attorney].'

We can also observe freezing effects on binding in English.[17] In the examples
in (46)-(47), for instance, the inverse scope reading cannot co-occur with the subject QP
binding the pronoun. (To ensure that the relevant anaphoric relation is that of bound
variable anaphora, I have utilized *at least NP*, which is a non-singular-denoting, and a
singular-denoting pronoun.[18])

(46) a. [$_S$ At least one company] recommended [$_O$ the two banks] to <u>its</u> customer.

    b. [$_S$ At least one professor] introduced [$_O$ every student] to <u>his</u> colleague.

(47) a. [$_S$ At least one company] recommended <u>its</u> customer to [$_O$ the two banks].

    b. [$_S$ At least one professor] introduced <u>his</u> colleague to [$_O$ every student].

We now turn to the generalization in (37b). First, observe that (48a) allows the
subject QP to take wide scope with respect to the indirect object QP, and (48b) permits
the indirect object QP to bind *soko* 'it'.

(48) a. Mosi [$_S$ hutatuizyoo-no ginkoo]-ga [$_O$ itutuizyoo-no zidoosyagaisya]-ni
        if   two:more-GEN bank-NOM   five:more-GEN automobile:company-DAT

       Toyota-no kanrengaisya-o   syookaisita ra, zidoosyagyookai-wa
       Toyota-GEN related:company-ACC introduced   if automobile:industry-TOP

       antaida.
       is:stable

---

[17]   Phenomena that seem analogous to freezing effects on binding are also noted in Fox 2000:Ch.2,
FN 52, p. 64, where he evaluates the interrogative raising analysis in Moltmann & Szabolcsi 1994.
Fox reports that the wide scope reading of the object QP over the subject QP is possible in (i-a), but
not in (i-b) with the relevant binding, but he does not provide any account for this contrast. (See also
Hornstein 1995, p.160 & p.180.)

(i)   (= Fox 2000:Ch.2, FN 52 (ii), p.64, slightly adapted)

    a. [$_S$ A girl] expected [$_O$ every boy] to come to the party.

    b. [$_S$ A girl] expected [$_O$ every boy] to come to <u>her</u> party.

[18]   I thank Anthony Kroch for pointing out that *at least NP* can be used for the relevant demonstra-
tion and for constructing examples similar to those in (46) (p.c. November 1999).

'(Lit.) If [$_S$ two or more banks] introduced Toyota's related company to [$_O$ five or more automobile companies], the automobile industry will remain stable.'

    b. Mosi Sumitomo ginkoo-ga [$_O$ <u>itutuizyoo-no zidoosyagaisya</u>]-ni
        if   Sumitomo Bank-NOM   five:more-GEN automobile:company-DAT

        <u>soko</u>-no   kanrengaisya-o   syookaisita ra, zidoosyagyookai-wa
        that:place-GEN related:company-ACC introduced if automobile:industry-TOP

        antaida.
        is:stable

        '(Lit.) If Sumitomo Bank introduced <u>its</u> related company to [$_O$ <u>five or more automobile companies</u>], the automobile industry will remain stable.'

As (49) illustrates, the instances of wide scope reading and bound variable anaphora under discussion can co-occur with each other. With logical formulas, the reading under discussion can be expressed as (50).

(49)   Mosi [$_S$ hutatuizyoo-no ginkoo]-ga [$_O$ <u>itutuizyoo-no zidoosyagaisya</u>]-ni
            if   two:more-GEN bank-NOM   five:more-GEN automobile:company-DAT

            <u>soko</u>-no   kanrengaisya-o   syookaisita ra, zidoosyagyookai-wa
            Toyota-GEN related:company-ACC introduced if automobile:industry-TOP

            antaida.
            is:stable

            '(Lit.) If [$_S$ two or more banks] introduced <u>its</u> related company to [$_O$ <u>five or more automobile companies</u>], the automobile industry will remain stable.'

(50) $\exists X\ (X \subseteq bank \land \left|X\right| \geq 2)\ \forall x\ (x \in X)\ [\exists Y\ (Y \subseteq automobile\ company\ \land$

        $\left|Y\right| \geq 5)\ \forall y\ (y \in Y)\ [x\ introduced\ y\text{'s}\ related\ company\ to\ y]]$

The generalization under discussion is also illustrated in (51) with different types of QPs.

(51)   a. [$_S$ Rei-no hutatu-no keieisoodan   zimusyo]-ga [$_O$ <u>takusan-no</u>
           the-GEN two-GEN management:consultation office-NOM   many-GEN

kaisya]-ni   soko-no   mondai-no kaiketuan-o teisyutusita.
company-DAT that:place-GEN problem-GEN solution-ACC reported

'(Lit.) [s The two management consultation companies] brought a solution to its problem to [o many companies].'

b. Maitosi, [s takusan-no kyoozyu]-ga [o hutariizyoo-no gakusei]-ni soitu-no
every:year many-GEN professor-NOM two:more-GEN student-DAT that:guy-GEN

ronbun-o kakinaosaseru.
paper-ACC make:rewrite

'(Lit.) Each year [s many professors] make [o two or more students] to rewrite his paper.'

We can also illustrate the generalization under discussion in English. In the examples in (52), for instance, while the wide scope reading of the subject QP over the object QP obtains, the object QP can still bind a pronoun.

(52)   a. [s Every professor] recommended [o at least one company] to a student who

hates it.

b. In the last three years, [s many professors] forced [o at least one student] to re-

write his qualifying paper.

We have thus observed that the generalizations in (37), repeated here, hold both in Japanese and English.

(37)   a. When WSR<QP$_{Obj}$, QP$_{Sub}$> obtains in the basic order, the narrow scope taking

QP, the QP$_{Sub}$, cannot bind a dependent term.

b. When WSR<QP$_{Sub}$, QP$_{Obj}$> obtains in the basic order, the narrow scope taking

QP, the QP$_{Obj}$, can still bind a dependent term.

2.2.3. Scope minimizing effects on negation

In this subsection, we will observe yet another difference between inverse and surface scope readings. In particular, I maintain that the following generalizations hold.

(53) a. When WSR<QP$_{Obj}$, QP$_{Sub}$> obtains in the basic order in which the verb is

negated, the scope of the verbal negation is limited to the verb itself.

b. When WSR<QP$_{Sub}$, QP$_{Obj}$> obtains in the basic order in which the verb is

negated, the scope of the verbal negation is not limited to the verb itself.

First consider the example in (54).

(54) (Context: We have been talking about two students, Lynn and Jennifer.)

If Prof. Smith does not recommend [$_O$ the two students] to Toyota, John would

be mad.

We can take (54) to mean that the condition for John to be mad is that it is not the case

that Prof. Smith recommends both Lynn and Jennifer (i.e., John would be mad if either

Lynn or Jennifer fails to be recommended), indicating that the negation can take scope

above the direct object QP.

Next, consider the sentence in (55).

(55) If [$_S$ more than three professors] do not recommend Bill to Toyota, John would

be mad.

(55) can be understood to mean that if the number of professors that recommend Bill to

Toyota does not reach four, John would be mad; hence, we may assume that the negation

can also take scope above the subject QP.

Now consider the sentence in (56).

(56) (Context: We have been talking about two students, Lynn and Jennifer.)

If [$_S$ more than three professors] do not recommend [$_O$ the two students] to

Toyota, John would be mad.

For the embedded clause, there are three logical scope orders, as listed in (57), provided that *the two students* takes scope above *more than three professors*.

(57) a. negation > *the two* > *more than three*

b. *the two* > negation > *more than three*

c. *the two* > *more than three* > negation

However, what is actually available among the three scope orders is only (57c), confirming the generalization in (53a).

Let me elaborate this point a little bit more. If the embedded clause of (56) is interpreted with the scope order in (57a), the entire meaning of (56) should be that John will be mad if it is not the case that both Lynn and Jennifer are recommended by four professors (= Reading 1). If the interpretation of the embedded clause is with the scope order in (57b), then the whole meaning of (56) should be that John will be mad under the condition that for each of Lynn and Jennifer, it does not hold that more than three professors recommend her (= Reading 2). If its interpretation is with the scope order in (57c), the entire sentence should mean that John will be mad if each of Lynn and Jennifer has more than three professors that do not recommend her to Toyota (= Reading 3). Our intuition is that Reading 3 is possible, but not Reading 1 or 2.

To substantiate the intuition truth-conditionally, let us consider the situations in (58).

(58) a. Situation 1

Regarding Lynn, four professors recommended her, but four professors refused to recommend. Regarding Jennifer, five professors recommended her, but four professors refused to recommend.

b. Situation 2

Regarding Lynn, one professor recommended her, but two professors refused

to recommend. Regarding Jennifer, two professors recommended her, but one

professor refused to recommend.

These situations differentiate Reading 3 from Readings 1 & 2. In Situation 1, John

would be mad under Reading 3, but not under Reading 1 & 2. In Situation 2, on the

other hand, John would be mad under Readings 1 & 2, but not under Reading 3. The

fact is that when (56) is uttered, John is mad in Situation 1, but not in Situation 2, sub-

stantiating our intuition that (56) gives rise to Reading 3, but not Reading 1 or 2.

I maintain that whenever WSR<QP_{Obj}, QP_{Sub}> obtains in the basic order (i.e., no

matter what kinds of QPs are used for the QP_{Obj} and the QP_{Sub}), the verbal negation must

take scope below both the QP_{Obj} and the QP_{Sub}. Here I supply two more examples to

further illustrate the generalization.

(59) a Since [$_S$ more than three students] did not vote for [$_O$ two professors], John must

be mad.

b. Contrary to our expectation, [$_S$ more than three students] did not approach [$_O$

every professors].

Japanese seems to work in the same way. In (60a) and (60b), for example, setting

aside the scope interaction among the QPs, the negation can take scope above the subject

QP, and the object QP (cf. McGloin 1976 and Imani 1993).[19] However, if the object

QP takes scope above the subject QP, the negation must take scope below both QPs.

(60)   a. Mosi [*s* hutariizyoo-no kyoozyu]-ga [*o* subete-no gakusei]-o   Toyota-ni
           if   two:more-GEN professor-NOM   all-GEN   student-ACC Toyota-DAT

           suisensi-na-katta   ra, John-wa hungaisuru daroo.
           recommend-not-PAST if   John-TOP get:mad   probably

           'If [*s* two or more professors] do not recommend [*o* every student] to Toyota,
           John would be mad.'

       b. [*s* Sanninizyoo-no gakusei]-ga [*o* rei-no   hutari-no kyoozyu]-ni
              three:more-GEN student-NOM   the-GEN two-GEN professor-DAT

           hanasikake-na-katta node, John-wa   gakkarisiteiru   daroo.
           talk-not-PAST   since John-TOP being:disappointed probably

           'Since [*s* three or more students] did not approach [*o* the two professors], John
           must be disappointed.'

Unlike inverse scope readings, surface scope readings do not minimize the scope

of a verbal negation. Consider the following sentence:

(61)   If [*s* three professors] do not recommend [*o* more than two students] to Toyota,

           John would be mad.

Within the embedded clause in (61), there are three logical scope orders, as listed in

(62), provided the subject QP takes wide scope with respect to the direct object QP.

(62)   a. negation> *three > more than two*

       b. *three* > negation> *more than two*

       c. *three > more than two* > negation

---

[19]   McGloin (1976) and Imani (1993) argue that the generalization maintained by Kuno (1980) and
Takubo (1985) that the scope of a verbal negation is the verb itself does not hold, as far as conditional
contexts are concerned.

As I will explain in detail below, all of the three scope orders seem to be available, confirming the generalization in (53b).

If the embedded clause in (61) is interpreted with the scope order in (62a), then the entire meaning of (61) should be that John will be mad if it is not the case that three professors each recommend more than two students to Toyota (= Reading 1). With the scope order in (62b), the whole meaning of (61) should be that John will be mad if there are three xs, x is a professor such that it is not the case that x recommend more than two students to Toyota (= Reading 2). With the scope order in (62c), the meaning of the whole sentence should be that John will be mad if there are three professors such that each of them has more than two students who he or she does not recommend to Toyota (= Reading 3). Our intuition is that (61) allows all of the readings.

To substantiate the intuition truth-conditionally, let us consider the three situations in (63).

(63) a. Situation 1

There are 3 and only 3 professors, A, B, and C.

A recommended 3 students and refused to recommend 3 students.

B recommended 3 students and refused to recommend 3 students.

C recommended 3 students and refused to recommend 3 students.

b. Situation 2

There are 6 and only 6 professors, A, B, C, D, E, and F.

A recommended 3 students and refused to recommend 1 student.

B recommended 3 students and refused to recommend 1 student.

C recommended 3 students and refused to recommend 1 student.

D recommended 2 students and refused to recommend 2 students.

E recommended 2 students and refused to recommend 2 students.

F recommended 2 students and refused to recommend 2 students.

c. Situation 3

There are 3 and only 3 professors, A, B, and C.

A recommended 2 students and refused to recommend 2 students.

B recommended 3 students and refused to recommend 1 student.

C recommended 3 students and refused to recommend 1 student.

In Situation 1, John must be mad under Reading 3, but not under Reading 1 or 2. In Situation 2, however, he should be mad under Reading 2, but not under Reading 1 or 3. In Situation 3, on the other hand, he must be mad under Reading 1, but not Reading 2 or 3. The fact seems to be that when (61) is uttered, John can be mad in all of the situations, substantiating the intuition that (61) gives rise to all of the readings.

A similar illustration can be provided with other types of QPs. Here I supply two additional examples.

(64) a Since [$_S$ more than three students] did not present [$_O$ two papers], John must be mad.

b. Contrary to our expectation, [$_S$ every student] did not approach [$_O$ more than two professors].

Japanese also supports the generalization under discussion (i.e., when WSR<QP$_{Sub}$, QP$_{Obj}$> obtains in the basic order, the scope of the verbal negation is not limited to the verb itself), although a certain scope order that is possible in English seems not to be available. For example, consider the following sentences:

(65) a. Mosi [$_S$ subete-no kyoozyu]-ga [$_O$ hutariizyoo-no gakusei]-o Toyota-ni
          if   all-GEN   professor-NOM two:more-GEN student-ACC Toyota-DAT

        suisensi-na-katta   ra, John-wa hungaisuru daroo.
        recommend-not-PAST if John-TOP get:mad   probably

        'If [$_S$ every professor] does not recommend [$_O$ two or more students] to Toyota, John would be mad.'

  b. [$_S$ Goninizyoo-no gakusei]-ga [$_O$ hutatu-no kasetu]-o   happyoosi-na-katta
          five:more-GEN student-NOM   two-GEN   hypotheses-ACC present-not-PAST

        node, John-wa gakkarisiteiru   daroo.
        since John-TOP being:disappointed probably

        'Since [$_S$ five or more students] did not present [$_O$ two hypotheses], John must be disappointed.'

In the embedded clauses of the examples in (65), there are three logically possible scope orders, provided the subject QP takes scope above the object QP. Among them, the *negation>subject>object* order and the *subject>object>negation* order are possible, although the *subject>negation>object* order is not.[20]

We have thus confirmed that the generalizations in (53), repeated here, hold in both English and Japanese.

(53) a. When WSR<QP$_{Obj}$, QP$_{Sub}$> obtains in the basic order in which the verb is

        negated, the scope of the verbal negation is limited to the verb itself.

  b. When WSR<QP$_{Sub}$, QP$_{Obj}$> obtains in the basic order in which the verb is

        negated, the scope of the verbal negation is not limited to the verb itself.

---

[20]   I suspect that the contrast between English and Japanese regarding the absence or presence of the *subject>negation>object* order is derived from a fundamental difference between the two languages, namely the presence or absence of subject raising (cf. Fukui 1986, Kitagawa 1986, Kuroda 1988).

We have observed above that when WSR<QP$_{Obj}$, QP$_{Sub}$> obtains in the basic order, the verbal negation cannot take wide scope with respect to the QP$_{Obj}$ or the QP$_{Sub}$. As illustrated in (66), it is also the case that when WSR<QP$_{Obj}$, QP$_{Sub}$> obtains in the basic order, the verbal negation fails to take wide scope with respect to another clause-mate QP that is not the QP$_{Sub}$ or the QP$_{Obj}$, further confirming the generalization in (53a).

(66) a. (Context: We have been talking about two students, Lynn and Jennifer.)

   If [$_S$ more than three professors] do not recommend [$_O$ the two students] to [$_O$ four companies], John would be mad.

   b. Since [$_S$ some professors] did not introduce [$_O$ every student] to [$_O$ more than two companies], John should be mad.

(66a), for example, cannot be taken to mean that John would be mad under the condition that each of Lynn and Jennifer has more than three professors who fail to achieve the goal of recommending her to four companies. This indicates that when *the two students* takes scope above *more than three professors* in (66a), it is not possible for the negation to take scope below *the two students* and *more than three professors* but above *four companies*. The only available interpretation in the situation under discussion is that the negation scopes below all of the QPs; i.e., John would be mad under the condition that each of Lynn and Jennifer has more than three professors who refused to recommend her and four companies to whom she was not recommended.

The same point can be made with Japanese examples. In the examples in (67), for instance, when the direct object QP or the indirect object QP takes scope above the subject QP, the other object QP must also take scope above the negation.

(67) a. Mosi [$_S$ hutariizyoo-no kyoozyu]-ga [$_O$ subete-no gakusei]-o [$_O$ yottu-no
       if   two:more-GEN professor-NOM all-GEN   student-ACC four-GEN

kaisya]-ni   suisensi-na-katta   ra, John-wa hungaisuru daroo.
company-DAT recommend-not-PAST if John-TOP get:mad   probably

'If [*S* two or more professors] do not recommend [*O* every student] to [*O* four companies], John would be mad.'

b. [*S* Dareka]-ga [*O* rei-no   hutari-no gakusei]-ni [*O* mittuizyoo-no   kaisya]-o
    someone-NOM the-GEN two-GEN   student-DAT   three:more-GEN company-ACC

syookaisi-na-katta node John-wa hungaisiteiru daroo.
introduce-not-PAST since John-TOP being:mad   probably

'Since [*S* someone] did not introduce [*O* three or more companies] to [*O* the two students], John must be mad.'

2.3. Summary

The generalizations that have emerged above are summarized in (68).

(68) a. WSR<QP_{Obj}, QP_{Sub}> obtains in the basic order only if all of the conditions, (i)-(iii), are met.[21]

b. WSR<QP_{Sub}, QP_{Obj}> obtains in the basic order even if it is not the case that all of the conditions, (i)-(iii), are met.

i. The speaker refers to a specific group with the QP taking wide scope.

ii. If there is a QP α that is not the QP_{Sub} or the QP_{Obj}, or a potential dependent term β, then the QP taking narrow scope does not take wide scope with respect to α or bind β.

iii. If the verb is negated, the scope of the verbal negation is limited to the verb itself.

---

[21]   But see FN 7.

In the next chapter, I will provide a theoretical characterization for the generalizations in (68). In particular, I will argue that surface scope readings can be considered as emerging through LF compositional computation while inverse scope readings cannot. The characteristics associated with inverse scope readings will thus turn out to be those of an extra-grammatical operation.

Chapter 3

Two Sources of Scope Interaction

3.1. Introduction

This chapter continues to investigate the scope interaction among *quantificational phrases* (= QPs). As in Chapter 2, I will refer to readings where one QP is within the scope of another QP as *wide scope readings*.[1] Among wide scope readings, readings whose scope order corresponds to the surface linear order of a given sentence will be called *surface scope readings*, and those whose scope order is reversed from the surface linier order of a given sentence *inverse scope readings*. For convenience, I will abbreviate a wide scope reading where a QP β is within the scope of a QP α to *WSR$<\alpha, \beta>$*.

In Chapter 2, we have investigated the scope interaction among QPs in the configuration of (1), where a QP_{Sub} and a QP_{Obj} stand for a subject QP and an object QP respectively, and concluded with the generalizations in (2). As in Chapter 2, the configuration in (1) is referred to as *the basic order* for convenience.

(1)   [… QP_{Sub} [… QP_{Obj} …]], where the QP_{Sub} and the QP_{Obj} are clause-mates

(2)   (= Chapter 2 (18))

    a. WSR$<QP_{Obj}, QP_{Sub}>$ obtains in the basic order only if all of the conditions, (i)-(iii), are met.[2]

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[1]   See the cautious remark in FN 1 in Chapter 2 regarding what counts as a wide scope reading.

[2]   But see FN 7 in Chapter 2.

b. WSR<QP$_{Sub}$, QP$_{Obj}$> obtains in the basic order even if it is not the case that all of the conditions, (i)-(iii), are met.

i. The speaker refers to a specific group with the QP taking wide scope.

ii. If there is a QP α that is not the QP$_{Sub}$ or the QP$_{Obj}$, or a potential dependent term β, then the QP taking narrow scope does not take wide scope with respect to α or bind β.

iii. If the verb is negated, the scope of the verbal negation is limited to the verb itself.

The aim of this chapter is to provide a theoretical characterization of the generalizations in (2). In particular, I will argue that (3) holds.

(3)   Surface scope readings may emerge through LF compositional computation while inverse scope readings do not.

The rest of the chapter is organized as follows. In Section 3.2, I put forth two pieces of arguments in support of (3), making crucial reference to comparative constructions and 'scrambling'. One conclusion drawn from Section 3.2 is that there are two sources of the scope interactions among QPs: (i) LF compositional computation and (ii) an extra-grammatical operation. Section 3.3 considers the implications of the generalizations in (2) in the light of this conclusion. Section 3.4 further substantiates the existence of the two sources of scope interaction, by demonstrating some instances of surface scope readings must involve the extra-grammatical operation (although surface scope readings generally can emerge through LF compositional computation). In Section 3.5, I probe into the nature of the extra-grammatical operation. Finally, I conclude

in Section 3.6 with a summary and a remark on the methodological implications of this chapter in studies of generative grammar.

3.2. Surface scope readings may emerge through LF compositional computation while inverse scope readings do not.

The proponents for the thesis that WSR<QP_{Sub}, QP_{Obj}> obtains in the basic order through LF compositional computation must assume that the basic order can be represented as (4a) at LF, where both the QP_{Sub} and the QP_{Obj} are in a position that is the sister of an element that denotes a one-place predicate, so as to accommodate their quantificational interpretations.[3] To derive (4a) from the basic order, it is standardly assumed that both the QP_{Sub} and the QP_{Obj} undergo covert syntactic movement (cf. May 1977).[4] Similarly, the proponents for the thesis that WSR<QP_{Obj}, QP_{Sub}> obtains in the basic order through LF compositional computation must assume that the basic order can be represented as (4b).[5]

(4)   (Ψ stands for an element that denotes a one-place predicate.)

   a. LF: [$_Ψ$ QP_{Sub} [$_Ψ$ QP_{Obj} [$_Ψ$ … t_{Sub} [… t_{Obj} …]]]]

   b. LF: [$_Ψ$ QP_{Obj} [$_Ψ$ QP_{Sub} [$_Ψ$ … t_{Sub} [… t_{Obj} …]]]]

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[3]   Among the proponents of the thesis are May (1977), Montague (1974), Cooper (1975, 1983), Aoun & Li (1994), Hornstein (1995), and Beghelli & Stowell (1997).

[4]   Works that do not adopt covert movement in May 1977 assume some analogous operations to derive the representations in (4), and *quantifying-in* in Montague 1974 and *the Cooper storage* in Copper 1975, 1983 are two such operations. May (1977) assumes that the movement is optional in principle although a QP must raise in order to have quantificational interpretation; however, Beghelli & Stowell (1997) maintain that it is due to feature-checking, hence, obligatory.

[5]   The researchers listed in FN 3 are among the proponents for the thesis.

We therefore obtain supportive evidence for the thesis in (3), by demonstrating that surface scope readings can be considered as emerging on the basis of (4a) while inverse scope readings cannot be understood to be based on (4b). In the following subsections, I will provide two pieces of such evidence, using comparative constructions and 'scrambling'.

3.2.1. CM-Comparatives

In this subsection, I argue that surface scope readings may emerge on the basis of (4a), but inverse scope readings are not based on (4b), by demonstrating that the generalizations in (5) hold, where the definition of A-position is (6).[6] The discussion in this section thus supports the view that a QP may or may not undergo covert movement.

(5)   a. WSR<QP_{Sub}, QP_{Obj}> can obtain in the basic order even if the QP_{Sub} or the

QP_{Obj} is not in an A-position at LF.

b. WSR<QP_{Obj}, QP_{Sub}> cannot obtain in the basic order if the QP_{Sub} or the QP_{Obj}

is not in an A-position at LF.

(6)   A position α is an A-position if, and only if α is a theta position of a verb or a

case position.

---

[6]   In a framework that assumes *AgrS* and *AgrO* (e.g. Hornstein 1995), the specs of AgrS and AgrO are case positions, and according to the definition in (6), they are regarded as A-positions. But because the empirical materials to be discussed in this section cannot be accounted for if we treat them as A-positions, I will not adopt such a framework in this paper. In other words, I assume that a position that is a case position but not a theta position is only the spec of an IP, i.e., A-positions consist of theta-positions and the spec of an IP. If the line of thinking in Fukui 1986, Kitagawa 1986, and Kuroda 1988 that Japanese lacks subject raising is correct, A-positions consist of only theta positions in Japanese, see also FN 20 in Chapter 2.

To demonstrate that (5) holds, we must first identify an environment where a noun phrase cannot stay in an A-position for an independent syntactic reason. I claim that the comparative construction exemplified by (7) is one such environment.

(7)   [$_{IP}$ [$_{AdvP}$ [$_{CP}$ John-ni   yorimo] sakini] [$_{IP}$ Kimura kyoozyu-ga   Bill-ni
                John-DAT than   early   Kimura professor-NOM Bill-DAT

Mary-o   syookaisita]] (to siyoo).
Mary-ACC introduced   that suppose

'(Suppose that) [$_{IP}$ [$_{IP}$ Prof Kimura introduced Mary to Bill] [$_{AdvP}$ earlier [$_{CP}$ than to John]]].'

(7) is understood to mean that Prof. Kimura introduced Mary to Bill earlier than he (= Prof. Kimura) introduced Mary to John, despite the fact that in the comparative clause, only *John-ni* is pronounced. Following Hoji 2002, I will refer to the comparative construction in (7) as *CM-comparative*, where (i) what is pronounced in the comparative clause is only a NP that serves as the locus of comparison, and (ii) the NP is case-marked.[7, 8] For convenience, I will call the NPs that serve as the locus of comparison *locus NPs* or simply *^{L}NPs*, e.g., *John* and *Bill* in (7).

---

[7]   The first property distinguishes CM-comparatives from, for example, the construction exemplified by (i-a) where the comparative clause contains a predicate besides the locus NP, and the second one distinguishes them from the construction exemplified by (i-b) where the comparative clause includes only the locus NP without a case-marker.

(i)   a. [$_{IP}$ [$_{AdvP}$ [$_{CP}$ [$_{IP}$ ec_1 John-ni ec_2 syookaisuru] yorimo] sakini] [$_{IP}$ Kimura kyoozyu$_1$-ga
                    John-DAT   introduce   than   early   Kimura professor-NOM
        Bill-ni Mary$_2$-o   syookaisita]] (to siyoo).
        Bill-DAT Mary-ACC introduced   that suppose
        '(Suppose that) [$_{IP}$ [$_{IP}$ Prof Kimura$_1$ introduced Mary$_2$ to Bill] [$_{AdvP}$ earlier [$_{CP}$ than [$_{IP}$ ec_1 introduced ec_2 to John]]]].'

    b. [$_{IP}$ [$_{AdvP}$ [$_{CP}$ John yorimo] sakini] [$_{IP}$ Kimura kyoozyu-ga   Bill-ni Mary-o
                    John than   early   Kimura professor-NOM Bill-DAT Mary-ACC
        syookaisita]] (to siyoo).
        introduced   that suppose
        '(Suppose that) [$_{IP}$ [$_{IP}$ Prof Kimura introduced Mary to Bill] [$_{AdvP}$ earlier [$_{CP}$ than John]]].'

Hoji (1998b, 2002) argues, on the basis of various kinds of bound anaphora, that the comparative clause of a CM-comparative is identical to its antecedent clause at LF, except the locus NPs.[9] Once Hoji's claim is endorsed, the LF copying or PF deletion analysis is called for. I endorse his claim, and adopt the LF copying analysis in Hoji 1998b, without further discussion.[10] For concreteness, I assume that (7), for example, is analyzed as (8).[11, 12]

Following Hoji (1998b, 2002), I assume that the constructions in (i) must be grammatically distinguished from CM-comparatives. We will discuss some difference between a CM-comparative and the construction exemplified by (i-b) later in this section.

[8]   The locus NPs in CM-comparatives must be dative-marked (or marginally accusative-marked). Accordingly, in all of the CM-comparative examples we will consider, the locus NPs are dative-marked.

[9]   Hoji (2002:Sections 3.4, 4.2, and 5.2) demonstrates that when bound variable anaphora cannot be established between two elements in the antecedent clause, a sloppy identity reading cannot obtain in the comparative clause, and Hoji (1998b:Section 3.3:143) shows that if bound variable anaphora obtains in the antecedent clause, then a sloppy identity reading is forced in the comparative clause.

[10]   The choice between LF copying and PF deletion does not affect any of the ensuring discussions.

[11]   As far as the linear order is concerned, the AdvP of a CM-comparative can appear sentence-initially, as in (7) or between any of two major constituents of the antecedent clause, as in (i-a)-(i-c).

(i)   a.   [IP [IP Kimura kyoozyu-ga   [AdvP [CP John-ni   yorimo] sakini] Bill-ni   Mary-o
              Kimura professor-NOM   John-DAT than   early   Bill-DAT Mary-ACC
         syookaisita]] (to   siyoo).
         introduced   that suppose

      b.   [IP [IP Kimura kyoozyu-ga   Bill-ni   [AdvP [CP John-ni   yorimo] sakini] Mary-o
              Kimura professor-NOM Bill-ni   John-DAT than   early   Mary-ACC
         syookaisita]] (to   siyoo).
         introduced   that suppose

      c.   [IP [IP Kimura kyoozyu-ga   Bill-ni Mary-o   [AdvP [CP John-ni   yorimo] sakini]
              Kimura professor-NOM Bill-ni Mary-ACC   John-DAT than   early
         syookaisita]] (to   siyoo).
         introduced   that suppose

However, all of the surface strings in (7), (i-a), (i-b), and (i-c) must be represented at LF in such a way that the AdvP locates sentence-initially as in (8); otherwise, the infinite regress problem ensues at the time of copying, very much as in the case of *antecedent contained deletion* in English (cf. May 1985), as pointed out in Watanabe 1993.

(8) a. Before *to Bill* (the ^{L}NP of the antecedent clause) raises

   [$_{IP}$ [$_{AdvP}$ [$_{CP}$ to John [$_{C'}$ [$_{IP}$ ec   ] than]] early] [$_{IP}$ Prof. Kimura introduced

   Mary to Bill]]

   b. After *to Bill* (the ^{L}NP of the antecedent clause) raises

   [$_{IP}$ [$_{AdvP}$ [$_{CP}$ to John [$_{C'}$ [$_{IP}$ ec   ] than]] early] [$_{IP}$ to Bill$_1$ [$_{IP}$ Prof. Kimura

   introduced Mary t$_1$]]]

   c. After LF copying takes place (= LF)

   [$_{IP}$ [$_{AdvP}$ [$_{CP}$ to John$_{1'}$ [$_{C'}$ [$_{IP}$ Prof. Kimura introduced Mary t$_{1'}$] than]] early] [$_{IP}$ to

   Bill$_1$ [$_{IP}$ Prof. Kimura introduced Mary t$_1$]]]

Crucially, this analysis assumes that the locus NP of the antecedent clause undergoes

constituent raising in the sense of Reinhart 1991 to adjoin the IP in which it originates,

so as to avoid non-constituent copying, hence it cannot stay in an A-position at LF. We

can thus utilize this construction to illustrate the generalizations in (5).

---

[12]   An anonymous reviewer for *NELS33* has pointed out that (i) below is also a conceivable analysis
for (7), where the locus NP of the antecedent clause, *Bill-ni* 'to Bill' raise to the IP that contains the
AdvP. I wish to assume without any discussion that (i) is ruled out by some parallelism principle
within a theory of focus.

(i)   a. Before *to Bill* (the ^{L}NP of the antecedent clause) raises

   [$_{IP}$ [$_{AdvP}$ [$_{CP}$ to John [$_{C'}$ [$_{IP}$ ec   ] than]] early] [$_{IP}$ Prof. Kimura introduced Mary to Bill]]

   b. After *to Bill* (the ^{L}NP of the antecedent clause) raises

   [$_{IP}$ to Bill$_1$ [$_{IP}$ [$_{AdvP}$ [$_{CP}$ to John [$_{C'}$ [$_{IP}$ ec   ] than]] early] [$_{IP}$ Prof. Kimura introduced Mary
   t$_1$]]]

   c. After LF copying takes place (= LF)

   [$_{IP}$ to Bill$_1$ [$_{IP}$ [$_{AdvP}$ [$_{CP}$ to John$_{1'}$ [$_{C'}$ [$_{IP}$ Prof. Kimura introduced Mary t$_{1'}$] than]] early] [$_{IP}$ Prof.
   Kimura introduced Mary t$_1$]]]

Let us begin with the generalization in (5a), i.e., WSR<QP$_{Sub}$, QP$_{Obj}$> can obtain in the basic order even if the QP$_{Sub}$ or the QP$_{Obj}$ is not in an A-position at LF. Consider the following examples:[13]

(9)   a. [$_{IP}$ [$_{AdvP}$ [$_{CP}$ Kimura kyoozyu-ni   yorimo] sakini] [$_{IP}$ sootyoo-ga
                  Kimura professor-DAT than   early   dean-NOM

        [$_S$ hutari-no zyokyoozyu]-ni   [$_O$ sanninizyoo-no gakusei]-o
          two-GEN assistant:professor-DAT three:more-GEN student-ACC

        suisensaseta]]   (koto)
        made:recommend that

        '(That) [$_{IP}$ [$_{IP}$ the dean made [$_S$ two assistant professors] recommend [$_O$ three or more students]] [$_{AdvP}$ earlier [$_{CP}$ than Prof. Kimura]]]'

    b. [$_{IP}$ [$_{AdvP}$ [$_{CP}$ Toyota-ni   yorimo] sakini] [$_{IP}$ seihu-ga   [$_S$ subete-no
                  Toyota-DAT than   early   government-NOM   all-GEN

        biirugaisya-ni]   [$_O$ mittuizyoo-no oote hokengaisya]-o
        beer:company-DAT three:more-GEN large insurance:company-ACC

        hihansaseta]] (koto)
        made:criticize that

        '(That) [$_{IP}$ [$_{IP}$ the government made [$_S$ every beer company] criticize [$_O$ three or more large insurance companies]] [$_{AdvP}$ earlier [$_{CP}$ than Toyota]]]'

The antecedent clauses of the CM-comparatives in (9) have the configuration of [NP$_{Sub}$ [QP$_{Sub}$ [QP$_{Obj}$ Verb]] Cause], where the QP$_{Sub}$ is the locus NP (hence, it cannot stay in an A-position at LF).[14] These examples nevertheless allow the subject QP in the antecedent clause to take wide scope with respect to the clause-mate object QP.

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[13]   As in Chapter 2, *S* and *O* in italicized bold subscript stand for *subject* and *object*, and are used to mark the QPs whose scope interaction is under discussion.

[14]   As mentioned in FN 8, the locus NPs in CM-comparatives must be dative-marked (or marginally accusative-marked). The use of CM-comparatives involving causative constructions here is necessitated for this reason.

This is not surprising under the assumption that WSR<QP_{Sub}, QP_{Obj}> can emerge in the basic order through LF compositional computation, more precisely, through the compositional computation applied to the LF representation, [$_\Psi$ QP_{Sub} [$_\Psi$ QP_{Obj} [$_\Psi$ … t_{Sub} [… t_{Obj} …]]]], where Ψ is an element that denotes a one-place predicate. We can assume, for example, that the availability of the surface scope reading in (9a) is attributed to the analysis in (10).

(10) a. After the QP_{Sub} (the ^{L}NP of the antecedent clause) raises

[$_{IP}$ [$_{AdvP}$ [$_{CP}$ Prof. Kimura [$_{C'}$ [$_{IP}$ ec   ] than]] early] [$_{IP}$ two assistant professors$_1$ [$_{IP}$ the dean made t_1 recommend three or more students]]]

b. After the QP_{Obj} raises

[$_{IP}$ [$_{AdvP}$ [$_{CP}$ Prof. Kimura [$_{C'}$ [$_{IP}$ ec   ] than]] early] [$_{IP}$ two assistant professors$_1$ [$_{IP}$ three or more students$_2$ [$_{IP}$ the dean made t_1 recommend t_2]]]

c. After LF copying takes place (= LF)

[$_{IP}$ [$_{AdvP}$ [$_{CP}$ Prof. Kimura$_{1'}$ [$_{C'}$ [$_{IP}$ three or more students$_2$ [$_{IP}$ the dean made $t_{1'}$ recommend t_2]] than]] early] [$_{IP}$ two assistant professors$_1$ [$_{IP}$ three or more students$_2$ [$_{IP}$ the dean made t_1 recommend t_2]]]

In fact, when the surface scope reading under discussion obtains in (9a), the scope order among the AdvP and the two QPs is exactly what (10) predicts.[15] That is, the meaning of (9a) can be (11c), but not (11a) or (11b).

---

[15] I assume that the AdvP in a CM-comparative is an existential quantifier over a degree variable plus its restrictor, cf. Larson 1988.

(11) a. $QP_{Sub} > QP_{Obj} > AdvP$

> There are two xs, x is an assistant professor such that there are three or more ys, y is a student such that the time at which the dean made x recommend y precedes the time at which he (= the dean) made Prof. Kimura recommend y.

b. $QP_{Sub} > AdvP > QP_{Obj}$

> There are two xs, x is an assistant professor such that the time at which there are three or more y_1s, y_1 is a student such that the dean made x recommend y_1 precedes the time at which there are three or more y_2s, y_2 is a student such that he (= the dean) made Prof. Kimura recommend y_2.

c. $AdvP > QP_{Sub} > QP_{Obj}$

> The time at which there are two xs, x is an assistant professor such that there are three or more y_1s, y_1 is a student such that the dean made x recommend y_1 precedes the time at which there are three or more y_2s, y_2 is a student such that he (= the dean) made Prof. Kimura recommend y_2.

To substantiate this intuition truth-conditionally, we may consider the following situations.

(12) There are two assistant professors, X and Y, and 8 students, A, B, C, D, E, F, G, and H.

a. Situation 1

> The dean made X recommend A, B, C, and D at the time Δ_1.
>
> The dean made Prof. Kimura recommend A, B, C, and D at the time Δ_2.
>
> The dean made Y recommend E, F, G, and H at the time Δ_3.
>
> The dean made Prof. Kimura recommend E, F, G, and H at the time Δ_4.

$\Delta_1 \neq \Delta_3$, $\Delta_2 \neq \Delta_4$, and Δ_1 and Δ_3 precedes Δ_2 and Δ_4 respectively.

b. Situation 2

The dean made X recommend A, B, C, and D, and Y recommend E, F, G, and H at the time Δ_1.

The dean has made Prof. Kimura recommend A, B, C, and D at the time Δ_2.

Δ_1 precedes Δ_2.

If the meaning of (9a) could be (11a) or (11b) in addition to (11c), (9a) should be able to be truthfully uttered in both of the situations in (12). If (11c) is the only available interpretation for (9a) among the three interpretations, on the other hand, (9a) should be true in (12b), but false in (12a). The fact seems to be that (9a) can be truthfully uttered only in (12b), substantiating the intuition that (9a) can give rise to (11c), but not (11a) or (11b). Hence, the analysis in (10) is motivated.

I have so far argued that WSR<QP_{Sub}, QP_{Obj}> obtains in the basic order even if the QP_{Sub} is not in an A-position. Let us now observe with the examples in (13) that WSR<QP_{Sub}, QP_{Obj}> can obtain in the basic order even if the QP_{Obj} is not in an A-position.

(13) a. [$_{IP}$ [$_{AdvP}$ [$_{CP}$ Kimura kyoozyu-ni   yorimo] sakini] [$_{IP}$ [$_S$ hutari-no gakusei]-ga
                Kimura professor-DAT than   early   two-GEN   student-NOM

   [$_O$ sanninizyoo-no zyokyoozyu]-ni   tikazuita]].
      three:more-GEN assistant:professor-DAT approached

   '[$_{IP}$ [$_{IP}$ [$_S$ Two students] approached [$_O$ three or more assistant professors]] [$_{AdvP}$ earlier [$_{CP}$ than Prof. Kimura]]].'

   b. [$_{IP}$ [$_{AdvP}$ [$_{CP}$ Toyota-ni   yorimo] sakini] [$_{IP}$ [$_S$ subete-no kyoozyu]-ga
                Toyota-DAT than   early   all-GEN   professor-NOM

[$_O$ mittuizyoo-no konpyuutaagaisya]-ni gakusei-o syookaisita]].
three:more-GEN computer:company-DAT student-ACC introduced

'[$_{IP}$ [$_{IP}$ [$_S$ Every professor] introduced students to [$_O$ three or more computer companies]] [$_{AdvP}$ earlier [$_{CP}$ than to Toyota]]].'

The antecedent clauses of the CM-comparatives in (13) have the configuration of [QP$_{Sub}$ [QP$_{Obj}$ Verb]] where the QP$_{Obj}$ is the locus NP (hence, it cannot stay in A-positions at LF). In these examples, the subject QP in the antecedent clause can take scope above the clause-mate object QP.

This is also expected under the assumption that surface scope readings can obtain through LF compositional computation. We can attribute, for example, the surface scope reading under discussion in (13a) to the analysis in (14).[16]

(14)   a.   After the QP$_{Obj}$ (the ^{L}NP of the antecedent clause) raises

[$_{IP}$ [$_{AdvP}$ [$_{CP}$ Prof. Kimura [$_{C'}$ [$_{IP}$ ec   ] than]] early] [$_{IP}$ three or more assistant professors$_2$ [$_{IP}$ two students approached t$_2$]]]

b.   After the QP$_{Sub}$ raises

[$_{IP}$ two students$_1$ [$_{IP}$ [$_{AdvP}$ [$_{CP}$ Prof. Kimura [$_{C'}$ [$_{IP}$ ec   ] than]] early] [$_{IP}$ three or more assistant professors$_2$ [$_{IP}$ t$_1$ approached t$_2$]]]

c.   After LF copying takes place (= LF)

[$_{IP}$ two students$_1$ [$_{IP}$ [$_{AdvP}$ [$_{CP}$ Prof. Kimura$_{2'}$ [$_{C'}$ [$_{IP}$ t$_1$ approached t$_{2'}$] than]] early] [$_{IP}$ three or more assistant professors$_2$ [$_{IP}$ t$_1$ approached t$_2$]]]

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[16]   Note that if *two students* does not raise above the AdvP, it cannot bind the trace *t$_1$* in the comparative clause, as illustrated in (i).

(i)   After LF copying takes place (= LF)
[$_{IP}$ [$_{AdvP}$ [$_{CP}$ Prof. Kimura$_{2'}$ [$_{C'}$ [$_{IP}$ t$_1$ approached t$_{2'}$] than]] early] [$_{IP}$ two students$_1$ [$_{IP}$ three or more assistant professors$_2$ [$_{IP}$ t$_1$ approached t$_2$]]]

Under the analysis in (14), it is predicted that when the surface scope reading under discussion obtains in (13a), the AdvP takes scope below the QP_{Sub} but above the QP_{Obj}. That is, (13a) can give rise to (15b), but not (15a) or (15c). Our intuition confirms that the prediction is correct.

(15) a. $QP_{Sub} > QP_{Obj} > AdvP$

There are two xs, x is a student such that there are three or more ys, y is a assistant professor such that the time at which x approached y precedes the time at which x approached Prof. Kimura.

b. $QP_{Sub} > AdvP > QP_{Obj}$

There are two xs, x is a student such that the time at which there are three or more ys, y is an assistant professor such that x approached y precedes the time at which x approached Prof. Kimura.

c. $AdvP > QP_{Sub} > QP_{Obj}$

The time at which there are two x_1s, x_1 is a student such that there are three or more ys, y is an assistant professor such that x_1 approached y precedes the time at which there are two x_2s, x_2 is a student such that x_2 approached Prof. Kimura.

The situations in (16) allow us to substantiate our intuition partially. (Since (15a) cannot be easily differentiated from (15b) truth-conditionally, the absence of (15a) is difficult to confirm.)

(16)   There are three students, X Y, and Z, and eight assistant professors, A, B, C, D, E, F, G, and H.

a. Situation 1

X approached A, B, C, and D at the time Δ_1.

X approached Prof. Kimura at the time Δ_2.

Y approached E, F, G, and H at the time Δ_3.

Y approached Prof. Kimura at the time Δ_4.

$\Delta_1 \neq \Delta_3$, $\Delta_2 \neq \Delta_4$, and Δ_1 and Δ_3 precede Δ_2 and Δ_4 respectively.

b. Situation 2

X approached A, B, C, and D, and Y approached E, F, G, and H at the time Δ_1.

X and Z approached Prof. Kimura at the time Δ_2.

Δ_1 precedes Δ_2.

If the meaning of (13a) could be (15c), in addition to (15b) (or (15a)), (13a) should be able to be true in both of the situations in (16). Otherwise, (13a) is true in (16a), but not in (16b). The fact seems to be that (13a) can be truthfully uttered only in (16a). Hence, we have partially substantiated our intuition above, and in turn the analysis in (14).

To sum up so far, I have, on one hand, argued that the generalization in (5a) holds (i.e., WSR<QP_{Sub}, QP_{Obj}> can obtain in the basic order even if the QP_{Sub} or the QP_{Obj} is not in an A-position at LF), and at the same time, confirmed that WSR<QP_{Sub}, QP_{Obj}> can obtain in the basic order through the compositional computation applied to the LF representation, [$_\Psi$ QP_{Sub} [$_\Psi$ QP_{Obj} [$_\Psi$ … t_{Sub} [… t_{Obj} …]]]], where Ψ is an element that denotes a one-place predicate.

I now turn to the generalization in (5b), i.e., WSR<QP_{Obj}, QP_{Sub}> cannot obtain in the basic order if the QP_{Sub} or the QP_{Obj} is not in an A-position. First consider the following sentences.

(17) a. [$_{IP}$ [$_{AdvP}$ [$_{CP}$ Kimura kyoozyu-ni   yorimo] sakini] [$_{IP}$ [$_S$ sanninizyoo-no
               Kimura professor-DAT than   early   three:more-GEN

gakusei]-ga   [$_O$ rei-no   hutari-no kyoozyu]-ni   tikazuita]].
student-NOM   the-GEN two-GEN professor-DAT approached

'[$_{IP}$ [$_{IP}$ [$_S$ Three or more students] approached [$_O$ the two professors]] [$_{AdvP}$ earlier [$_{CP}$ than Prof. Kimura]]].'

b. [$_{IP}$ [$_{AdvP}$ [$_{CP}$ Toyota-ni   yorimo] sakini] [$_{IP}$ [$_S$ sanninizyoo-no kyoozyu]-ga
              Toyota-DAT than   early   three:more-GEN professor-NOM

[$_O$ subete-no amerika-no   zidoosyagaisya]-ni   gakusei-o   suisensita]].
   all-GEN   America-GEN automobile:company-DAT student-ACC recommended

'[$_{IP}$ [$_{IP}$ [$_S$ Three or more professors] recommended students to [$_O$ every American automobile company]] [$_{AdvP}$ earlier [$_{CP}$ than to Toyota]]].'

The antecedent clauses of the CM-comparatives in (17) have the configuration of [QP$_{Sub}$ [QP$_{Obj}$ (NP$_{Obj}$) Verb]] where the QP$_{Obj}$ is the locus NP (hence, it cannot stay in an A-position at LF). What is of interest is that the examples in (17) do not allow the object QP in the antecedent clause to take scope above the subject QP, despite the fact that the antecedent clauses, while pronounced independently, can allow such an option, as illustrated in (18).

(18)   a. [$_S$ Sanninizyoo-no gakusei]-ga [$_O$ rei-no   hutari-no kyoozyu]-ni   tikazuita.
            three:more-GEN student-NOM   the-GEN two-GEN   professor-DAT approached

'[$_S$ Three or more students] approached [$_O$ the two professors].'

b. [$_S$ Sanninizyoo-no kyoozyu]-ga [$_O$ subete-no amerika-no
        three:more-GEN professor-NOM all-GEN   America-GEN

zidoosyagaisya]-ni gakusei-o   suisensita.
automobile:company-DAT student-ACC recommended

'[$_S$ Three or more professors] recommended students to [$_O$ every American automobile company].'

The observation regarding the sentences in (17) is rather unexpected under the assumption that WSR<QP$_{Obj}$, QP$_{Sub}$> can obtain in the basic order through LF composi-

tional computation, i.e., the compositional computation applied to the LF representation, $[_\Psi \text{QP}_{Obj} [_\Psi \text{QP}_{Sub} [_\Psi \ldots t_{Sub} [\ldots t_{Obj} \ldots]]]]$, where Ψ is an element that denotes a one-place predicate. Under this assumption, we can, for example, reasonably analyze (17a) as (19), predicting the inverse scope reading under discussion to be possible with the scope order of the AdvP taking scope above both the subject and object QPs, (if not with the other two scope orders).

(19)   After the QP_{Obj} (the ^{L}NP of the antecedent clause) raises

$[_{IP} [_{AdvP} [_{CP} \text{Prof. Kimura}_{1'} [_{C'} [_{IP} \quad ec \quad] \text{than}]] \text{early}] [_{IP} \text{the two professors}_1$

$[_{IP} \text{three or more students approached } t_1]]]$

    a. After the QP_{Sub} raises

$[_{IP} [_{AdvP} [_{CP} \text{Prof. Kimura}_{1'} [_{C'} [_{IP} \quad ec \quad] \text{than}]] \text{early}] [_{IP} \text{the two professors}_1$

$[_{IP} \text{three or more students}_2 [_{IP} t_2 \text{ approached } t_1]]]]$

    b. After LF copying (= LF)

$[_{IP} [_{AdvP} [_{CP} \text{Prof. Kimura}_{1'} [_{C'} [_{IP} \text{three or more students}_2 [_{IP} t_2 \text{ approached } t_1]]$

$\text{than}]] \text{early}] [_{IP} \text{the two professors}_1 [_{IP} \text{three or more students}_2 [_{IP} t_2 \text{ approached}$

$t_1]]]]$

    I conclude on the basis of the contrast between (17) and (18) that WSR<QP_{Obj}, QP_{Sub}> fails to obtain in the basic order if the QP_{Obj} is not in an A-position. The comparison of (17) with (20) further corroborates the conclusion.

(20) a. $[_{IP} [_{AdvP} [_{CP} \text{Kimura kyoozyu yorimo}] \text{sakini}] [_{IP} [_S \text{sanninizyoo-no gakusei}]\text{-ga}$
                      Kimura professor than   early   three:more-GEN student-NOM

        $[_O \text{rei-no hutari-no kyoozyu}]\text{-ni tikazuita}]]$.
         the-GEN two-GEN professor-DAT approached

'[IP [IP [S Three or more students] approached [O the two professors]] [AdvP earlier [CP than Prof. Kimura]]].'

   b. [IP [AdvP [CP Toyota yorimo] sakini] [IP [S sanninizyoo-no kyoozyu]-ga
                   Toyota   than   early   three:more-GEN professor-NOM

   [O subete-no amerika-no zidoosyagaisya]-ni   gakusei-o   suisensita]].
     all-GEN   America-GEN automobile:company-DAT student-ACC recommended

'[IP [IP [S Three or more professors] recommended students to [O every American automobile company]] [AdvP earlier [CP than Toyota]]].'

The examples in (20) are exactly identical to those in (17) except that the locus NPs of the comparative clauses are not case-marked. Following Hoji (2002), I will call the comparative construction in (20) *Non-CM-comparative*. Hoji (2002) argues, on the basis of various kinds of bound variable anaphora, that unlike a CM-comparative, a Non-CM-comparative does not involve LF copying (or PF deletion) (i.e., its comparative clause contains an instance of (covert) *deep anaphor* in the sense of Hankamer & Sag 1976), implying that the locus NP of the antecedent clause in a Non-CM-comparative needs not move out of the IP in which it originates, and may stay in an A-position.[17] Strikingly,

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[17] The following empirical materials also support for the thesis that a Non-CM-comparative does not involve LF copying (or PF deletion).

(i)   a.   John-wa [AdvP [CP Mary-ni yorimo] sakini] Susan-ni email-de soodansita.
              John-TOP   Mary-DAT than   early Susan-DAT email-with consulted
              'John consulted with Susan through email [AdvP [CP earlier than with Mary]].'

     b.   John-wa [AdvP [CP Mary yorimo] sakini] Susan-ni email-de soodansita.
              'John consulted with Susan through email [AdvP [CP earlier than Mary]].'

(i-a) can be true, for example, in the situation where John consulted, on a given day, with Mary by telephone at 10am, with Susan by email at 2pm, and with Mary by email at 6pm. (i-b), by contrast, cannot be true if John contacted Mary earlier than Susan. This observation indicates that (i-a), but not (i-b), can allow the comparative clause to mean that John consulted with Mary through email; hence, CM-comparatives can be considered as involving IP-ellipsis while Non-CM-comparatives cannot. Furthermore, it is not reasonable to consider Non-CM-comparatives as involving some form of ellipsis; for, it is conceptually difficult to maintain the licensing condition for ellipsis that rules out for (i-b) the ellipsis corresponding to the antecedent clause, *John consulted x through email*, but not the ellipsis corresponding to its part, *John consulted* x.

the Non-CM-comparatives in (20), although their surface forms are very similar to those of the CM-comparatives in (17), allow the object QP in the antecedent clause to take wide scope with respect to the subject QP, and this is fully consistent with the conclusion that WSR<QP_{Obj}, QP_{Sub}> fails to obtain in the basic order if the QP_{Obj} is not in an A-position.

Let us now consider the availability of WSR<QP_{Obj}, QP_{Sub}> in the basic order in the situation where the QP_{Sub} cannot be in an A-position. The CM-comparative examples in (21) are relevant for addressing the issue.

(21) a. [$_{IP}$ [$_{AdvP}$ [$_{CP}$ Kimura kyoozyu-ni   yorimo] sakini] [$_{IP}$ sootyoo-ga
                        Kimura professor-DAT than   early   dean-NOM

      [$_S$ sanninizyoo-no zyokyoozyu]-ni   [$_O$ rei-no hutari-no gakusei]-o
        three:more-GEN assistant:professor-DAT the-GEN two-GEN student-ACC

      suisensaseta]]   (to siyoo).
      made:recommend (that suppose)

      '(Suppose that) [$_{IP}$ [$_{IP}$ the dean made [$_S$ three or more assistant professors]
      recommend [$_O$ the two students]] [$_{AdvP}$ earlier [$_{CP}$ than Prof. Kimura]]].'

   b. [$_{IP}$ [$_{AdvP}$ [$_{CP}$ Toyota-ni   yorimo] sakini] [$_{IP}$ seihu-ga   [$_S$ mittuizyoo-no
                      Toyota-DAT than   early   government-NOM three:more-GEN

      biirugaisya]-ni   [$_O$ subete-no oote hokengaisya]-o   hihansaseta]]
      beer:company-DAT   all-GEN   large insurance:company-ACC made:criticize

      (to siyoo).
      that suppose

      '(Suppose that) [$_{IP}$ [$_{IP}$ the government made [$_S$ three or more beer companies]
      criticize [$_O$ every large insurance company]] [$_{AdvP}$ earlier [$_{CP}$ than Toyota]]].'

The antecedent clauses in (21) have the configuration of [NP_{Sub} [QP_{Sub} [QP_{Obj} Verb]] Cause], where the QP_{Sub} is the locus NP (hence, it cannot stay in A-position at LF). As

in the above cases, these examples do not permit the object QP in the antecedent clause to take scope above the subject QP, although such an option is available when the antecedent clauses are pronounced independently, as shown in (22).

(22) a. Sootyoo-ga [$_S$ sanninizyoo-no zyokyoozyu]-ni   [$_O$ rei-no hutari-no
       dean-NOM   three:more-GEN assistant:professor-DAT the-GEN two-GEN

     gakusei]-o suisensaseta]   (to   siyoo).
     student-ACC made:recommend (that suppose)

     '(Suppose that) the dean made [$_S$ three or more assistant professors] recommend [$_O$ the two students].'

   b. Seihu-ga   [$_S$ mittuizyoo-no biirugaisya]-ni [$_O$ subete-no oote
      government-NOM   three:more-GEN beer:company-DAT all-GEN   large

      hokengaisya]-o   hihansaseta   (to   siyoo).
      insurance:company-ACC made:criticize   that suppose

      '(Suppose that) the government made [$_S$ three or more beer companies] criticize [$_O$ every large insurance company]].'

Once again, this fact is rather unexpected under the assumption that inverse scope readings can emerge through LF compositional computation. For nothing prevents us from analyzing (22a), for example, as (23), and expecting the inverse scope reading under discussion to be possible with the scope order of the AdvP taking scope below the object QP and above the subject QP.

(23) a. After the QP$_{Sub}$ (the ^{L}NP of the antecedent clause) raises

     [$_{IP}$ [$_{AdvP}$ [$_{CP}$ Prof. Kimura$_{1'}$ [$_{C'}$ [$_{IP}$ ec   ] than]] early] [$_{IP}$ three or more

     assistant professors$_1$ [$_{IP}$ the dean made t$_1$ recommend the two students.]]]

   b. After the QP$_{Obj}$ raises

     [$_{IP}$ the two students$_2$ [$_{IP}$ [$_{AdvP}$ [$_{CP}$ Prof. Kimura$_{1'}$ [$_{C'}$ [$_{IP}$ ec   ] than]] early] [$_{IP}$

     three or more assistant professors$_1$ [$_{IP}$ the dean made t$_1$ recommend t$_2$]]]]

c. After LF copying takes place (= LF)

[$_{IP}$ the two students$_2$ [$_{IP}$ [$_{AdvP}$ [$_{CP}$ Prof. Kimura$_{1'}$ [$_{C'}$ [$_{IP}$ the dean made t$_{1'}$

recommend t$_2$] than]] early] [$_{IP}$ three or more assistant professors$_1$ [$_{IP}$ the dean

made t$_1$ recommend t$_2$]]]]

The Non-CM-comparative counterparts of (21), on the other hand, can give rise to

the inverse scope readings under discussion, as illustrated in (24).

(24) a. [$_{IP}$ [$_{AdvP}$ [$_{CP}$ Kimura kyoozyu yorimo] sakini] [$_{IP}$ sootyoo-ga
　　　　　　　　　 Kimura professor than　　 early　　 dean-NOM

[$_S$ sanninizyoo-no zyokyoozyu]-ni　　 [$_O$ rei-no　hutari-no gakusei]-o
　 three:more-GEN assistant:professor-DAT　the-GEN two-GEN　student-ACC

suisensaseta]]　　(to　siyoo).
made:recommend (that suppose)

'(Suppose that) [$_{IP}$ [$_{IP}$ the dean made [$_S$ three or more assistant professors]
recommend [$_O$ the two students]] [$_{AdvP}$ earlier [$_{CP}$ than Prof. Kimura]]].'

b. [$_{IP}$ [$_{AdvP}$ [$_{CP}$ Toyota yorimo] sakini] [$_{IP}$ seihu-ga　　　　 [$_S$ mittuizyoo-no
　　　　　　　 Toyota than　　 early　　 government-NOM three:more-GEN

biirugaisya]-ni　　 [$_O$ subete-no oote hokengaisya]-o　　　　 hihansaseta]]
beer:company-DAT　 all-GEN　　large insurance:company-ACC made:criticize

(to　siyoo).
that suppose

'(Suppose that) [$_{IP}$ [$_{IP}$ the government made [$_S$ three or more beer companies]
criticize [$_O$ every large insurance company]] [$_{AdvP}$ earlier [$_{CP}$ than Toyota]]].'

I take the contrast between (21) on the one hand, and (22) and (24) on the other as

evidence that WSR<QP$_{Obj}$ QP$_{Sub}$> cannot obtain in the basic order if the QP$_{Sub}$ is not in

an A-position.

I have thus demonstrated that the generalizations in (5) holds, repeated here.

(5)   a. WSR<QP$_{Sub}$, QP$_{Obj}$> can obtain in the basic order even if the QP$_{Sub}$ or the

QP$_{Obj}$ is not in an A-position at LF.

b. WSR<QP$_{Obj}$, QP$_{Sub}$> cannot obtain in the basic order if the QP$_{Sub}$ or the QP$_{Obj}$

is not in an A-position at LF.

The following English materials seem to be also in support of (5).

(25)   a. [$_{IP}$ [$_{IP}$ [$_S$ Every student] talked to [$_O$ some professor]] [$_{AdvP}$ earlier [$_{CP}$ than to

Prof. Kimura]]].

b. [$_{IP}$ [$_{IP}$ [$_S$ Most professors] introduced student to [$_O$ three or more companies]]

[$_{AdvP}$ earlier [$_{CP}$ than to Toyota]]].

(26)   a. [$_{IP}$ [$_{IP}$ [$_S$ Every student] talked to [$_O$ some professor]] [$_{AdvP}$ earlier [$_{CP}$ than Prof.

Kimura]]].

b. [$_{IP}$ [$_{IP}$ [$_S$ Most professors] introduced student to [$_O$ three or more companies]]

[$_{AdvP}$ earlier [$_{CP}$ than to Toyota]]].

The examples in (25) differ minimally from those in (26) in the presence or absence of

the preposition *to* in the comparative clauses, and both allow the subject QP in the ante-

cedent clause to take scope above its clause-mate the object QP. Let us refer to the for-

mer as *PP-comparative* and the latter as *Non-PP-comparative*.

What is of interest is that PP-comparatives do not allow the object QP in the

antecedent clause to take scope above the subject QP, while such an option is permitted

in Non-PP-comparatives. This is illustrated in (27)-(28).

(27)   a. [$_{IP}$ [$_{IP}$ [$_S$ Some student] talked to [$_O$ every assistant professor]] [$_{AdvP}$ earlier [$_{CP}$

than to Prof. Kimura]]].

b. [$_{IP}$ [$_{IP}$ [$_S$ Three or more professors] introduced students to [$_O$ the two companies]] [$_{AdvP}$ earlier [$_{CP}$ than to Toyota]]].

(28)   a. [$_{IP}$ [$_{IP}$ [$_S$ Some student] talked to [$_O$ every assistant professor]] [$_{AdvP}$ earlier [$_{CP}$ than Prof. Kimura]]].

b. [$_{IP}$ [$_{IP}$ [$_S$ Three or more professors] introduced students to [$_O$ the two companies]] [$_{AdvP}$ earlier [$_{CP}$ than Toyota]]].

Under the assumption that (i) a PP-comparative is analyzed on a par with a CM-comparative, and (ii) a Non-PP-comparative is (or can be) analyzed as a Non-CM-comparative, the generalizations in (5) nicely account for the fact that PP-comparatives allow surface scope readings but not inverse scope readings, cf. (25) and (27), while Non-PP-comparatives allow both of the readings, cf. (26) and (28).

I conclude on the basis of the generalizations in (5) that surface scope readings may emerge on the basis of (4a) while inverse scope readings are not due to (4b), and that the former may emerge through LF compositional computation while the latter does not.

3.2.2. Covert and overt mismatch[18]

In this subsection, I will provide another piece of evidence that WSR<QP$_{Obj}$, QP$_{Sub}$> does not obtain in the basic order through the compositional computation applied to the LF representation, [$_\Psi$ QP$_{Obj}$ [$_\Psi$ QP$_{Sub}$ [$_\Psi$ … t$_{Sub}$ [… t$_{Obj}$ …]]]], where Ψ is an element that denotes a one-place predicate.

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[18]   Some of the discussion in this section is also found in Hayashishita 2000a:Section 3.2, pp.286-288.

Consider the generalizations in (2) once again, which I repeat here for convenience.

(2)   (= Chapter 2 (68))

a. WSR<QP$_{Obj}$, QP$_{Sub}$> obtains in the basic order only if all of the conditions, (i)-(iii), are met.

b. WSR<QP$_{Sub}$, QP$_{Obj}$> obtains in the basic order even if it is not the case that all of the conditions, (i)-(iii), are met.

i. The speaker refers to a specific group with the QP taking wide scope.

ii. If there is a QP α that is not the QP$_{Sub}$ or the QP$_{Obj}$, or a potential dependent term β, then the QP taking narrow scope does not take wide scope with respect to α or bind β.

iii. If the verb is negated, the scope of the verbal negation is limited to the verb itself.

Suppose that inverse scope readings were able to emerge through LF compositional computation. Then, the generalizations in (2a) would be interpreted as indicating that the LF representations in (29)-(31), where Ψ signifies an element that denotes a one-place predicate, and the QP$_{Sub}$ and the QP$_{Obj}$ are clause-mates, are, for example, not accessible to the speaker.

(29)   LF: [$_\Psi$ QP$_{Obj}$ [$_\Psi$ QP$_{Sub}$ [$_\Psi$ … t$_{Sub}$ [… t$_{Obj}$ …]]]],

where the QP$_{Obj}$ does not refer to a specific group

(30)   a. LF: [$_\Psi$ QP$_{Obj}$ [$_\Psi$ QP$_{Sub}$ [$_\Psi$ QP$_\alpha$ [$_\Psi$ … t$_{Sub}$ [… t$_{Obj/\alpha}$ … t$_{\alpha/Obj}$ …]]]]]

b. LF: [$_\Psi$ QP$_{Obj}$ [$_\Psi$ QP$_{Sub}$ [$_\Psi$ … t$_{Sub}$ [… NP$_\alpha$/t$_{Obj}$ … t$_{Obj}$/NP$_\alpha$ …]]]],

where the NP$_\alpha$ is bound by the QP$_{Sub}$

(31) a. LF: [not [$_\Psi$ QP$_{Obj}$ [$_\Psi$ QP$_{Sub}$ [$_\Psi$ … t$_{Sub}$ [… t$_{Obj}$ …]]]]]

b. LF: [$_\Psi$ QP$_{Obj}$ [not [$_\Psi$ QP$_{Sub}$ [$_\Psi$ … t$_{Sub}$ [… t$_{Obj}$ …]]]]]

The proponents of the thesis under discussion, therefore, may seek out some pragmatic principles so as to systematically rule out the representations in (29)-(31) (although to formulate such principles seems rather difficult, to say the least).[19, 20] I contend, however, that the speaker does utilize the representations under discussion. Hence, resorting to pragmatic principles is not an option, and the thesis that WSR<QP$_{Obj}$, QP$_{Sub}$> can obtains in the basic order through LF compositional computation must be rejected.

My argument is on the basis of the scope interaction in the configuration of [QP$_{Obj}$ [… QP$_{Sub}$ …]]], where the QP$_{Obj}$ and the QP$_{Sub}$ are clause-mates, (= the scrambled order). As we will observe below, WSR<QP$_{Obj}$, QP$_{Sub}$> obtains in the scrambled order even if it is not the case that all of the conditions in (2-i)-(2-iii) are met, and one of the direct implications from this generalization is that the speaker's intuitions regarding the availability of WSR<QP$_{Obj}$, QP$_{Sub}$> in the scrambled order are based on the representations in (29)-(31).

Let us now go over some empirical materials to illustrate the generalization under discussion. First, the examples in (32) illustrate that WSR<QP$_{Obj}$, QP$_{Sub}$> obtains in the scrambled order even when it is reasonable to assume that the speaker does not refer to a

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[19] Incidentally, ruling them out by pragmatic principles is not an option for Hornstein 1995 and Beghelli & Stowell 1997, since they assume that wide scope readings in general, including inverse scope readings, are consequences of feature-driven movement.

[20] I thank Barry Schein for pointing out to me (p.c. March 2001) that the proponents may resort to pragmatic principles and maintain the thesis under discussion.

specific group with the QP_{Obj}. This suggests that (29) is an accessible LF representation for the speaker.

(32)   (Cf. Chapter 2 (15).)

   a. USC-de-wa maitosi   [$_O$ goninizyoo-no sinnyuusei]-o   [$_S$ sannin-no
      USC-at-TOP every:year   five:more-GEN   new:student-ACC   three-GEN

      kyoozyu]-ga   zinbunkagakusyoo-ni suisensuru.
      professor-NOM humanity:award-DAT   recommend

      '(Lit.) In USC, each year, [$_O$ five or more incoming students], [$_S$ three professors] recommend for the humanity award.'

   b. kondo-no   gakkai-wa,   mosi [$_O$ takusan-no happyoosya]-ni [$_S$ hutariizyoo-no
      coming-GEN conference-TOP if   many-GEN   presenter-DAT   two:more-GEN

      hito]-ga   giron-o   sikaketa ra, seikoo to   siyoo.
      person-NOM argument-ACC initiated if   success that suppose

      '(Lit.) In the coming conference, if [$_O$ many presenters], [$_S$ two or more persons] argue with, let us consider the conference to be a success.'

Second, the examples in (33) show that in the configuration, $[QP_{\alpha}$ [… QP_{Sub} […QP_{β}/t_{α} … t_{α}/QP_{β} …]]], where the QP_{α} is the direct or indirect object, and the QPs are clause-mates, WSR<QP_{α}, QP_{Sub}> can co-occur with WSR<QP_{Sub}, QP_{β}>, suggesting that the speaker also utilizes the LF representation in (30a).

(33)   (Cf. Chapter 2 (22), (27), and (29).)

   a. [$_O$ rei-no   hutari-no gakusei]-o [$_S$ sanninizyoo-no kyoozyu]-ga [$_O$ hutatu-no
      the-GEN two-GEN   student-ACC   three:more-GEN professor-NOM two-GEN

      kaisya]-ni   suisensiteita.
      company-DAT recommended

      '(Lit.) [$_O$ The two students], [$_S$ three or more professors] recommended to [$_O$ two companies].'

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order. I hence conclude that the LF representations in (31) are also accessible to the speaker.

(35)   (Cf. Chapter 2 (60).)

   a. Mosi [$_O$ subete-no gakusei]-o [$_S$ hutariizyoo-no kyoozyu]-ga   Toyota-ni
      if   all-GEN   student-ACC two:more-GEN professor-NOM Toyota-DAT

      suisensi-na-katta   ra, John-wa hungaisuru daroo.
      recommend-not-PAST if John-TOP get:mad   probably

      '(Lit.) If [$_O$ every student], [$_S$ two or more professors] do not recommend to
      Toyota, John would be mad.

   b. [$_O$ Rei-no hutari-no kyoozyu]-ni [$_S$ sanninizyoo-no gakusei]-ga
        the-GEN two-GEN professor-DAT three:more-GEN student-NOM

      hanasikake-na-katta node, John-wa gakkarisiteiru   daroo.
      talk-not-PAST   since John-TOP being:disappointed probably

      '(Lit.) Since [$_O$ the two professors], [$_S$ three or more students] did not approach,
      John must be disappointed.'

Given that the LF representations in (29)-(31) are the accessible representations for the speaker, I take the generalization in (2a) as constituting evidence against the thesis that WSR<QP$_{Obj}$, QP$_{Sub}$> obtains in the basic order based on the LF in (4b), pointing to the conclusion that the reading under discussion does not emerge through LF compositional computation.

3.3. Two sources of scope interaction: (i) LF compositional computation and (ii) MINOR, an extra-grammatical operation

In Section 3, we have reached the conclusion that surface scope readings may obtain through LF compositional computation while inverse scope readings do not. It thus follows that (i) there are (at least) two sources of wide scope readings, LF compositional computation and an extra-grammatical operation, which I will call MINOR for conven-

ience, and (ii) inverse scope readings must be due to MINOR. In the light of this, I claim that the generalizations in (2) are part of the generalizations in (36).

(36) a. WSR<α, β> can obtain due to MINOR, where α and β are QPs, only if all of the conditions, (i)-(iii), are met.[21]

b. WSR<α, β> can obtain through LF compositional computation, where α and β are QPs, even if it is not the case that all of the conditions, (i)-(iii), are met

i. The speaker refers to a specific group with α.

ii. If there is a QP γ that is not α or β or a potential dependent term δ, then β does not take wide scope with respect to γ or bind δ

iii. If the verb of which α is an argument is negated, the scope of the verbal negation is limited to the verb itself.

I also maintain (37), based on the discussion in Sections 3.2.1, supporting the view that a QP may or may not undergo covert movement.

(37) When WSR<α, β> obtains due to MINOR, where α and β are QPs, both α and β stay in an A-position.

3.4. Surface scope readings involving MINOR

I have so far argued that inverse scope readings must be due to MINOR while surface scope readings need not. Logically speaking, nothing excludes the possibility that surface scope readings can be due to MINOR. In this section, I argue that some instances of surface scope readings are indeed due to MINOR, thereby further supporting

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[21] But see FN 7 in Chapter 2.

the thesis that there are two sources of scope interaction: LF compositional computation and MINOR.

First consider the following sentence:

(38)   [$_S$ Every professor] did not recommend [$_O$ three or more students] to Toyota.

(38) can be taken to mean that each professor has three or more students that he or she did not recommend to Toyota, and this fact leads us to conclude that while *every professor* takes wide scope with respect to *three or more students*, *three or more students* can still take scope above the negation.

There are three logically possible analyses to account for the reading under discussion in (38), which are listed in (39). (Recall that if WSR<α, β> obtains due to MINOR, where α and β are QPs, the scope of the verbal negation that is a clause-mate of α is limited to the verb itself, see (36).)

(39)   a. Analysis 1

         WSR<QP$_{Sub}$, QP$_{Obj}$>, obtaining in the basic order where the verb is negated, is
         due to MINOR, provided that the QP$_{Obj}$ takes scope above the negation.

       b. Analysis 2

         WSR<QP$_{Sub}$, QP$_{Obj}$>, obtaining in the basic order where the verb is negated, is
         through LF compositional computation, provided that the QP$_{Obj}$ takes scope
         above the negation.

       c. Analysis 3

WSR<QP$_{Sub}$, QP$_{Obj}$>, obtaining in the basic order where the verb is negated,

may be either due to MINOR or through LF compositional computation,

provided that the QP$_{Obj}$ takes scope above the negation.

Analysis 1 is possible only if the assumption in (40a) is valid, and Analyses 2 & 3, on

the other hand, depend on the assumption in (40b).[22]

(40)   a. Assumption 1

An object QP cannot raise above its clause-mate verbal negation via covert

movement.

b. Assumption 2

An object QP can raise above its clause-mate verbal negation via covert

movement.

To examine which analysis is correct, let us consider the following example:

(41)   [$_S$ Every professor] did not recommend [$_O$ three or more students] to [$_\alpha$ two

companies].

Under Analyses 2 & 3, which depend on the assumption in (40b), it is predicted that (41)

can be represented at LF as either (42a) or (42b). Hence, we expect that *every professor*

can take wide scope with respect to *three or more students*, which in turns scope above

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[22]   Analysis 1, if maintained, thus argues in effect that the *shortest move* principle in Fox 2000 below is an absolute principle, contra Fox (2000), who claims that a QP, after moving to the closest position in which it is interpretable, can continue to raise as long as the *scope economy* principle is not violated.

(i)   (= Fox 2000:Ch.2 (6), p.23)
         Shortest Move
         QR must move a QP to the closest position in which it is interpretable. In other words, a QP must always move to the closest clause-denoting element that dominates it.

two companies, with either of the scope orders in (43a) and (43b); i.e, (41) can be used
to express the interpretations in (44a) and (44b).

(42) a. [$_{IP}$ every professor$_1$ [$_{NegP}$ three or more students$_2$ [$_{NegP}$ two companies$_3$ [$_{NegP}$ not

[$_{VP}$ t$_1$ … t$_2$ … t$_3$ …]]]]]

b. [$_{IP}$ every professor$_1$ [$_{NegP}$ three or more students$_2$ [$_{NegP}$ not [$_{VP}$ two companies$_3$

[$_{VP}$ t$_1$ … t$_2$ … t$_3$ …]]]]]

(43) a. *every > three or more > two >* negation

b. *every > three or more >* negation *> two*

(44) a. Each professor has three or more students such that for each of the students,

there are two companies to which he or she (= student) was not

recommended by him or her (= professor).

b. Each professor has three or more students such that for each of the students, it

is not the case that he or she (= student) was recommended to two companies.

Analysis 1, on the other hand, adopts the assumption in (40a); hence, it predicts
that (41) cannot be represented at LF as (42a) or (42b), and the readings under discus-
sion is not possible for (41) if it is interpreted through LF compositional computation.
Under Analyses 1 & 3, the interpretation of (41) may involve MINOR. But MINOR
also does not give rise to (44a) or (44b) for the following reasons. If the wide scope
reading of *every professor* over *three or more students* obtains in (41) due to MINOR,
three or more students should not be able to take scope above *two companies*.

The fact seems to be that (41) cannot be used to indicate (44a) or (44b). When
every professor takes wide scope with respect to *three or more students*, which in turn
scopes above *two companies*, in (41), the negation may take scope below *every profes-*

sor, but must take scope above the other QPs. I hence reject Analyses 2 & 3, and adopt Analysis 1 with the assumption in (40a). We have thus observed an instance of a surface scope reading due to MINOR.

A similar argument can be constructed, using binding. First observe that the sentence in (45) can be understood to mean that each professor has at least one student that he or she did not recommended to Toyota, indicating that while *every professor* takes wide scope with respect to *at least one student* in (45), *at least one student* can take scope above the negation.

(45)   [$_S$ Every professor] did not recommend [$_O$ at least one student] to Toyota.

To account for the reading under discussion in (45), the three analyses in (39) are logically possible.

To examine which analysis to be maintained, we may consider (46).

(46)   [$_S$ Every professor] did not recommend [$_O$ <u>at least one student</u>] to <u>his</u> favorite
           company.

Under Analyses 2 & 3, which adopt the assumption in (40b), (46) should be able to be represented as (47), and we predict that (46) can be understood to mean that each professor has at least one student that he or she did not recommend to his or her favorite company.

(47)   [$_{IP}$ every professor$_1$ [… [$_{NegP}$ at least one student$_2$ [$_{NegP}$ not [$_{VP}$ t$_1$ … t$_2$ … *his* …
           ]]]]]

Analysis 1, however, leads us to predict that such a reading is not possible. Because Analysis 1 adopts the assumption in (40a), (47) is not an available representation for (46); hence, LF compositional computation does not give rise to the reading under

discussion. MINOR does not give us the reading either. For, if the wide scope reading of *every professor* over *at least one student* obtains in (46) through MINOR, *at least one* should not be able to bind a dependent term. The fact, once again, speaks for Analysis 1.

We can also motivate Analysis 1, using other types of QPs. Here, I provide two more sets of examples. In the examples in (48), the direct object QP can take scope above the negation while the subject QP takes wide scope with respect to it.

(48) a   If [$_S$ many professors] did not introduce [$_O$ two students] to companies, the chair would get mad.

  b. [$_S$ A half of the professors] did not recommend [$_O$ more than two students] to Toyota.

However, as illustrated in the sentences in (49), when the subject QP takes scope above the direct QP, which in turn takes scopes above the indirect QP, neither the direct QP nor the indirect QP can take scope above the negation. This is consistent with Analysis 1, but not with Analysis 2 or 3.

(49) a   If [$_S$ many professors] did not introduce [$_O$ two students] to [$_O$ at least one company], the chair would get mad.

  b. [$_S$ A half of the professors] did not recommend [$_O$ more than two students] to [$_O$ at least one company].

To the extent that Analysis 1 is correct, the assumption in (40a) must be valid. Under the assumption that there are two and only two sources of scope interaction among QPs, (i) LF compositional computation and (ii) MINOR, we thus predict from (40a) that the generalization in (50) should hold.

(50)   Let α be an object QP and β any QP other than α.

In the event that α takes scope above its clause-mate negation, neither WSR<α,

β> nor WSR<β, α> can obtain through LF compositional computation, and

they must be due to MINOR.

The prediction seems to be correct as the following discussion indicates. In the

sentences in (51), the wide scope reading of the direct object QP over the indirect object

QP is possible, but if the direct object QP takes scope above the negation at the same

time, the indirect object QP cannot take scope below the negation, i.e., it must take scope

above it.

(51)   a. Prof. Smith did not recommend [$_O$ more than three students] to [$_O$ two

companies].

b. John did not introduce [$_O$ every girl] to [$_O$ more than three girls].

(51a), for example, can be taken to mean that there are more than three students such

that each of the students has two companies such that Prof. Smith did not recommend

him or her to them, but it cannot be understood to mean that there are more than three

students such that for each of the students, it is not the case that Prof. Smith recommend

his or her to two companies. This directly follows from (50). When the direct object QP

takes scope over the negation in the sentences under discussion, the wide scope reading

of the direct object QP over the indirect object QP must be due to MINOR. We then

expect that the negation should take scope below both of the QPs. (Recall that when

WSR<α, β> obtains due to MINOR, where α and β are QPs, the scope of the verbal ne-

gation that is clause-mate of α is limited to the verb itself.) We have thus not only con-

firmed the prediction in (50), but also observed another instance of a surface scope reading due to MINOR.

We have so far argued for the existence of wide scope readings due to MINOR with English and Japanese in a parallel fashion (i.e., Chapter 2 and the preceding sections of the present chapter except Section 3.2.2). One may thus wonder if we can also observe in Japanese instances of surface scope readings that are due to MINOR. Although I believe that there are such instances, it does not seem possible to isolate them in the way we did for English, given that a verbal negation in Japanese is morphologically affixed to the verb and the option of the negation taking scope only the verb itself seems always available even when a given sentence is interpreted through LF compositional computation.[23] I leave the identification of surface scope readings due to MINOR in Japanese for my future research.

3.5. On MINOR

I have argued above that there are two sources of scope interaction among QPs, LF compositional computation and an extra-grammatical operation (the latter of which I will continue to call MINOR). One may legitimately ask what the extra-grammatical operation is. To address such a question, we must first rigorously describe the nature of cognitive domains other than the grammar and how they interact with the grammar, and such a task is beyond the scope of this dissertation. In this section, I would nevertheless

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[23]   In Hayashishita 2000c, I assume that a verbal negation in Japanese is attached not to the verb itself, but to the VP headed by it, and attempt to produce a paradigm that is similar to the English paradigm above. Admittedly, however, the reported judgments are subtle and not convincing.

like to spell out the properties of the extra-grammatical operation on the basis of the preceding discussions and provide some speculative remarks.

3.5.1. Properties of MINOR

In this subsection, I will spell out four properties that should be attributed to MINOR. First, the generalization that both surface and inverse scope readings can be due to MINOR seems to indicate (52).

(52)   Property 1

MINOR is an operation that does not make reference to c-command.

Second, the generalization that WSR<α, β> obtains due to MINOR, where α and β are QPs, only if the speaker refers to a specific group with α suggests (53).

(53)   Property 2

MINOR includes the substantiation of a specific group that is 'compatible with' the denotation of a QP.

Third, the generalization that when WSR<α, β> obtains due to MINOR, where α and β are QPs, some interpretive restriction is imposed on β, as well as on the verbal negation that is a clause-mate of α, indicates that MINOR is an operation that applies to more than α, the scope taking element. The (unchallenged) observation that the QP$_\beta$ in the configuration of [$_{IP}$ … QP$_\alpha$ [$_{IP}$ …. QP$_\beta$ …]] cannot take wide scope with respect to the QP$_\alpha$, as illustrated in (54) (cf., May 1988, Ruys 1992 and Fox 2000), seems to suggest that the domain of MINOR consists of only the items that are major constituents of the same clause. I hence maintain (55).

(54)   (= Fox 2000:Ch.2 (88), p. 62)

    a. #Someone said that every man is married to Sue.

    b. #Someone said that Sue is married to every man.

(55)   Property 3

    MINOR operates on a domain consisting of A_1, A_2, ... A_n, where A_1, A_2, ... A_n

    are major constituents of the same clause.

Recall the generalization that when WSR$<\alpha, \beta>$ obtains due to MINOR, where α

and β are QPs, β cannot take scope above another QP. Since the scope interaction due to

MINOR requires both of the QPs to be in A-positions, the possibility that the QP β takes

wide scope with respect to another QP through LF compositional computation is auto-

matically excluded. But what is implied in this generalization is that the other possibil-

ity, namely the scope taking of the QP β due to MINOR is also excluded. I hence main-

tain (56).

(56)   Property 4

    MINOR is an operation that makes one element bear clausal scope, and is

    allowed only once per its domain.

In fact, the generalization that when WSR$<QP_{Obj}, QP_{Sub}>$ obtains in the basic order, the

QP_{Sub} cannot scope over another QP or bind a dependent term is part of the general gen-

eralization that when WSR$<QP_{Obj}, QP_{Sub}>$ obtains in the basic order, no clause-mate of

the QP_{Obj} can scope over or bind another element. In the configurations in (57), for ex-

ample, WSR<QP$_{Obj}$, QP$_{Sub}$> cannot co-occur with WSR<QP$_{Sub}$, QP$_{\alpha}$> or WSR< QP$_{\alpha}$,

QP$_{Sub}$>.[24]

(57) a. [… QP$_{Sub}$ [… QP$_{Obj}$ … QP$_{\alpha}$ …]], where QP$_{Sub}$, QP$_{Obj}$ and QP$_{\alpha}$ are clause-

mates

b. [… QP$_{Sub}$ [… QP$_{\alpha}$ … QP$_{Obj}$ …]], where QP$_{Sub}$, QP$_{Obj}$ and QP$_{\alpha}$ are clause-

mates

c. [… QP$_{\alpha}$ … QP$_{Sub}$ [… QP$_{Obj}$ …]], where QP$_{Sub}$, QP$_{Obj}$ and QP$_{\alpha}$ are clause-

mates

3.5.2. Speculative remarks

I have spelled out above four properties that should be attributed to MIINOR. On

the basis of these properties, I would like to speculate that MINOR is an operation that

applies to a domain consisting of *A₁, A₂, … Aₙ*, where *A₁, A₂, … Aₙ* are major constituents

of the same clause, and create a mental representation where a specific group, which is

'grabbed' from some cognitive domain other than the lexicon of the language on the basis

of the lexical information of an NP/a QP in the domain of the operation, is associated

with one place predicate, which is formed on the basis of the lexical information of the

rest of the elements in the domain. I speculate that the wide scope reading of *three pro-*

fessors over *more than two students* in (58) is, for example, due to the representation in

(59).

(58) (Context: You investigate how many students visited Prof. A, Prof. B, and

Prof. C, and report the result.)

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[24] A partial illustration of this generalization is given in Hayashishita 2000a:Section 5, p. 295.

More than two students visited three professors.

(59)   {a, b, c} --- λx ∃y (*visited* (x, y) ∧ *more-than-two* (y) ∧ *student* (y))

One may wonder why the generalization holds that when WSR<α, β> obtains due to MINOR, where α and β are QPs, some interpretive restriction is imposed on β, as well as the verbal negation that is a clause-mate of α. Regarding this question, I would like to speculate as follows. MINOR, I believe, is an operation that associates a specific group with one place predicate, crucially without making reference to c-command relation. Within the predicate, therefore, the c-command relations of the elements are not defined, and as a consequence, the scope order cannot be defined. Hence, when WSR<α, β> obtains due to MINOR, where α and β are QPs, β cannot take scope above another QP or bind a dependent term. The reason why the scope of a verbal negation in the situation under discussion is limited to the verb itself is that what a verbal negation can do without making reference to c-command information is only to negate the verb next to it, and as a consequence, it appears to take scope below all of its clause-mate QPs.

I would also like to attribute the generalization that WSR<α, β> obtains due to MINOR, where α and β are QPs, only if both α and β stay in an A-position to the assumption that MINOR does not make reference to c-command relation. Since c-command relation is not available information for MINOR, if an element α is in an A'-position, the binding relation between it and its trace cannot be interpreted, and as a consequence, the information regarding which verb α is an argument of and which theta role

α has cannot be retrieved. Hence, MINOR is not possible if an element in its domain

is not in an A-position.[25]

3.5.3. Can MINOR be considered as *Predication* in the sense of Kuroda 1992:Ch.1?

The properties of MINOR spelled out in Section 3.5.1 and the speculative remark

regarding MINOR in Section 3.5.2 remind us of *Predication* in the sense of Kuroda

1992:Ch.1.

Traditionally, it is understood that the speaker, uttering a declarative sentence, as-

serts a proposition to be true. Kuroda (1992:Ch.1), drawing on Marty's work, maintains

that there are two distinct cognitive acts with which a proposition can be formed. They

are called *Predication* and *Description*.

Kuroda assumes that Predication is a cognitive act in which some entity, *Subject*,

is substantiated beyond mere perception, and it is associated with an attribute, *Predicate*.

According to his claim, when the speaker utters (60), for example, some cat is substanti-

ated, and the entity is associated with an attribute λx (*x sleeps-well*).

(60)   (= Kuroda 1992:Ch.1 (7))

The cat sleeps well.

If every declarative sentence were to involve Predication, the recognition of such a

cognitive act would be trivial. Kuroda argues, however, that such is not the case. He

claims, for example, when the speaker utters (61) upon observing that a cat is sleeping,

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[25]   One may wonder if a representation by MINOR can be created without the generative procedure
of the grammar. Although I acknowledge the possibility, I do not have an argument for, or against,
the view.

she or he does not substantiate a specific entity beyond the perception relevant for the observation; hence, Predication is not involved.

(61)   (= Kuroda's 1992:Ch.1 (21))

         A cat is sleeping there.

Note the resemblance between the characteristics of Predication and of MINOR. In Predication, some entity is substantiated in the speaker's mind, cf. Property 2 of MINOR in (53),[26] and this entity is associated with one place predicate. Furthermore, it is understood that Predication is allowed once per its domain, as one NP in a clause can correspond to the Subject of Predication, cf. Property 4 of MINOR in (56).

The similarity between Predication and MINOR is not limited to what is mentioned above. Ueyama (1998) extends Kuroda's (1992:Ch.1) intuition to embedded contexts. In our terms, she claims that the embedded clause of the perceptual report construction in (62) cannot express Predication.

(62)   John-ni   neko-ga neteiru   tokoro-ga   mieta.
         John-DAT cat-NOM is:sleeping moment-NOM saw

         'John saw a cat sleeping.'

Notice that the speaker in (62) is simply reporting that John had the perception of a certain event, namely, a cat is sleeping. It is reasonable to assume that the speaker does not

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[26]   Kuroda (1992:ch.1) assumes that an NP that corresponds to the Subject of Predication must be definite. This assumption is based on (i) another assumption that in Japanese, an NP that corresponds to the Subject of Predication must be a WA-marked NP and (ii) the fact that a WA-marked NP can be translated to a definite noun, but not to an indefinite noun in non-generic contexts. I wish to contend, however, that a non-WA-marked NP can also correspond to the Subject of Predication. To the extent that this contention is reasonable, Kuroda's characterization of the Subject of Predication is not founded; for a non-WA-marked NP can be translated into a definite or indefinite noun. And his claim regarding (61) must be modified as follows: when the speaker utters (61) upon observing that a cat is sleeping, she or he NEED NOT substantiate a specific entity beyond the relevant perception; hence Predication MAY NOT be involved.

substantiate any entity beyond the confines of John's perception and thus Predication is not involved in the embedded clause. What is of our interest is that MINOR seems unable to operate in the embedded clause of the perceptual report construction. As we will observe shortly, inverse scope readings, which emerge due to MINOR, cannot obtain in the embedded clause under discussion, but the availability of surface scope readings is unaffected.

First, inverse scope readings are possible in 'regular' embedded clauses. This is illustrated in (63).

(63) a. (Context: You have certain two professors in mind, Prof. A and Prof. B.)

John-wa [$_{IP}$ [$_S$ sanninizyoo-no gakusei]-ga [$_O$ hutari-no kyoozyu]-ni
John-TOP   three:more-GEN student-NOM   two-GEN   professor-DAT

hanasikaketeita] to   hookokusitekita.
was:speaking   that reported

'John reported that [$_{IP}$ [$_S$ three or more students] were speaking to [$_O$ two professors]]'

b. John-wa [$_{IP}$ [$_S$ sukunakutomo sannin-no kyoozyu]-ga [$_O$ subete-no gakusei]-o
John-TOP   at:least   three-GEN professor-NOM all-GEN   student-ACC

sikatteita]   to   itteita.
was:scolding that said

'John said that [$_{IP}$ [$_S$ at least three professors] were scolding at [$_O$ every student]].'

We can utter truthfully (63a), for example, in the situation that John reported that Mark, Luke, and John were speaking to Prof. A, and Paul, Barnabas, Timothy, and Peter were speaking to Prof. B.

However, inverse scope readings cannot obtain in the embedded clause of the perceptual report construction under discussion, as the examples in (64) illustrate.

(64) a. (Context: You have certain two professors in mind, Prof. A and Prof. B.)

John-ni [IP [S sanninizyoo-no gakusei]-ga [O hutari-no kyoozyu]-ni
John-DAT   three:more-GEN student-NOM   two-GEN professor-DAT

hanasikaketeiru] tokoro-ga   mieta.
is:speaking   moment-NOM saw

'John saw [IP [S three or more students] speaking to [O two professors]].'

b. John-ni [IP [S sukunakutomo sannin-no kyoozyu]-ga [O subete-no gakusei]-o
John-DAT   at:least   three-GEN professor-NOM all-GEN   student-ACC

sikatteiru] tokoro-ga   mieta.
is:rebuking moment-NOM saw

'John saw [IP [S at least three professors] scolding at [O every student]].'

We can also find a contrast that seems analogous to the one we have just observed in English. As the examples in (65) and (66) illustrate, inverse scope readings are possible in 'regular' embedded clauses, but not in the embedded clause of the perceptual report construction.

(65) a. (Context: You have certain two professors in mind, Prof. A and Prof. B.)

John reported that [IP [S more than three professors] were talking to [O two professors]].

b. John said that [IP [S at least three students] were greeting [O every professor]].

(66) a. (Context: You have certain two professors in mind, Prof. A and Prof. B.)

John saw [IP [S more than three professors] talking to [O two professors]].

b. John saw [IP [S at least three students] greeting [O every professor]].

The availability of surface scope readings, on the other hand, is insensitive to the clause type difference under discussion. As the examples in (67) and (68) illustrate, surface scope readings can obtain both in 'regular' embedded clauses and in the embedded clause of the perceptual report construction.

(67)   a. John-wa [$_{IP}$ [$_S$ sanninizyoo-no gakusei]-ga [$_O$ hutari-no kyoozyu]-ni
         John-TOP   three:more-GEN student-NOM two-GEN professor-DAT

         hanasikaketeita] to   hookokusitekita.
         was:speaking   that reported

       'John reported that [$_{IP}$ [$_O$ three or more students] were speaking to [$_O$ two professors]].'

    b. John-wa [$_{IP}$ [$_S$ subete-no gakusei]-ga [$_O$ sanninizyoo-no kyoozyu]-ni
         John-TOP   all-GEN   student-NOM three:more-GEN professor-DAT

         aisatusiteita] to   itteita.
         was:greeting that said

       'John said that [$_{IP}$ [$_S$ every student] was greeting [$_O$ three or more professors]].'

(68)   a. John-ni [$_{IP}$ [$_S$ sanninizyoo-no gakusei]-ga [$_O$ hutari-no kyoozyu]-ni
         John-DAT   three:more-GEN student-NOM two-GEN professor-DAT

         hanasikaketeiru] tokoro-ga   mieta.
         is:speaking   moment-NOM saw

       'John saw [$_{IP}$ [$_S$ three or more students] speaking to [$_O$ two professors]].'

    b. John-ni [$_{IP}$ [$_S$ subete-no gakusei]-ga [$_O$ sanninizyoo-no kyoozyu]-ni
         John-DAT   all-GEN   student-NOM three:more-GEN professor-DAT

         aisatusiteiru] tokoro-ga   mieta.
         is:greeting   moment-NOM saw

       'John saw [$_{IP}$ [$_S$ every student] greeting [$_O$ three or more professors]].'

The same seems to be true also in English, as illustrated in (69) and (70).

(69)   a. John reported that [$_{IP}$ [$_S$ more than three students] were talking to [$_O$ two professors]].

b. John said that [$_{IP}$ [$_S$ every student] was greeting [$_O$ more than two professors]].

(70) a. John saw [$_{IP}$ [$_S$ more than three students] talking to [$_O$ two professors]].

b. John saw [$_{IP}$ [$_S$ every student] greeting [$_O$ more than two professors]].

In summary, we have observed some similarities between MINOR and Predication in the sense of Kuroda 1992:Ch.1. In the absence of a rigorous description of the nature of cognitive domains other than the grammar and how they interact with the grammar, we are obviously not at the stage of determining whether or not we can equate MINOR with Predication. However, whatever proposal one may put forth for MINOR must account for the generalization that wide scope readings cannot obtain due to MINOR in a certain type of a clause.

3.6. Summary and further remarks

In this chapter, I have argued that there are two sources of wide scope readings, (i) LF compositional computation and (ii) MINOR, an extra-grammatical operation. It is demonstrated that the sources of surface scope readings may be either LF compositional computation or MINOR while inverse scope readings must be due to MINOR. I have also maintained that when WSR$<\alpha, \beta>$ obtains due to MINOR, where α and β are QPs, both α and β stay in A-positions. It is thus entailed that when WSR$<$QP$_{Sub}$, QP$_{Obj}>$ obtains in the basic order, the relevant LF may be either (71a) or (71b).

(71)   (Ψ stands for an element that denotes a one-place predicate.)

a. [$_\Psi$ QP$_{Sub}$ [$_\Psi$ QP$_{Obj}$ [$_\Psi$ … t$_{Sub}$ [… t$_{Obj}$ …]]]]

b. [$_\Psi$ … QP$_{Sub}$ [$_\Psi$ … QP$_{Obj}$ …]], where the QP$_{Sub}$ and QP$_{Obj}$ are in an A-position

As noted in Chapter 1, reported judgments regarding scope interpretations are often controversial. Given the discussion in this chapter, this state of affair is no longer surprising. It may well be the case that one reports his or her intuition regarding a given sentence, making reference only to LF compositional computation, and the other, considering both LF compositional computation and MINOR. Indeed, a reasonable interpretation of the conflict between Chomsky (1957) and Katz & Postal (1964) briefly sketched in Chapter 1 is precisely this, i.e., Chomsky (1957) being the former, and Katz & Postal (1964) being the latter. It is perhaps worth noting in this connection that Chomsky qualifies his generalization with "*under the normal interpretation of these sentences*", and Katz & Postal with "*although the facts are far from clear*".

This chapter has also provided us with the operational tests by which we can determine that a given scope interpretation of a given sentence emerges directly from LF compositional computation, thereby situating us in a better position to investigate LF properties than it has been. With the generalizations in (36) alone, repeated here, three such tests can be constructed.

(36)   a. WSR<α, β> can obtain due to MINOR, where α and β are QPs, only if all of the conditions, (i)-(iii), are met.

   b. WSR<α, β> can obtain through LF compositional computation, where α and β are QPs, even if it is not the case that all of the conditions, (i)-(iii), are met

   i. The speaker refers to a specific group with α.

   ii. If there is a QP γ that is not α or β or a potential dependent term δ, then β does not take wide scope with respect to γ or bind δ

    iii. If the verb of which α is an argument is negated, the scope of the verbal

       negation is limited to the verb itself.

Furthermore, it is demonstrated that covert movement is more limited than it has been thought. We have observed in Section 3.4 that an object QP cannot raise above its clause-mate negation through covert movement; the *shortest move* principle in Fox 2000:Ch.2 is an absolute principle, see FN 22. In addition, the generalization that surface scope readings may obtain in the basic order based on the LF in (4a) while inverse scope readings obtained in the basic order are not due to the LF in (4b) leads us to conclude that a QP α can c-commands a QP β at LF only if α c-commands β prior to covert movement (cf. Reinhart 1976, Huang 1982, Hoji 1985) in both English and Japanese. (4) is repeated here for convenience.

(4)   (Ψ stands for an element that denotes a one-place predicate.)

    a. LF: $[_\Psi \, QP_{Sub} \, [_\Psi \, QP_{Obj} \, [_\Psi \, \ldots \, t_{Sub} \, [\, \ldots \, t_{Obj} \, \ldots \,]]]]$

    b. LF: $[_\Psi \, QP_{Obj} \, [_\Psi \, QP_{Sub} \, [_\Psi \, \ldots \, t_{Sub} \, [\, \ldots \, t_{Obj} \, \ldots \,]]]]$

This conclusion is also consistent with the fact that the 'preposed' object QP in the scrambled order can take scope above the subject QP through LF compositional computation (see Section 3.2.2), under the unchallenged assumption that the 'preposed' object QP in the scrambled order can be understood as c-commanding the subject QP prior to covert movement (cf. Hoji 1985, Yoshimura 1992, Saito 1992, and Ueyama 1998, 2002, among others). Making reference only to the scope interaction between two QPs through LF compositional computation, therefore, we are now able (i) to investigate their c-command relation prior to covert movement, and (ii) to address the issue of the

base order in a given construction in languages whose word order is, or appears to be, free.[27]

Finally, I did not attempt to provide a concrete proposal regarding what MINOR exactly is, (though I have spelled out the properties that whatever proposal one may put forth must account for). As a consequence, a number of phenomena associated with the scope interaction due to MINOR were also left unaccounted for, e.g., no account was provided for (36a-ii) and (36a-iii). By definition, MINOR is not a grammatical operation, and we cannot define it with theoretical postulates in a theory of the grammar. As I have noted earlier, to put forth a reasonable proposal regarding MINOR requires a rigorous description of the properties of cognitive domains other than the grammar and their interaction with the grammar. Given that there is no study available in the field that seems to be useful for our present concern, it was inevitable that we would leave open the theoretical characterization of MINOR in the present study.

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[27]   Hayashishita (2000b) examines the base order of the *di*-transitive construction in Japanese, making use of some of the operational tests that are based on the materials in this chapter.

Chapter 4

Isomorphism Principle

4.1 Introduction

In Chapter 3, I have established the thesis that there are two sources for the scope interaction among *quantificational noun phrases* (= QPs): (i) LF compositional computation and (ii) MINOR, an extra-grammatical operation. In the course of the establishment, I have examined the scope interaction in the configuration in (1), where QP_{Sub} stands for a subject QP and QP_{Obj} an object QP, and concluded that the wide scope reading of the QP_{Sub} over the QP_{Obj} may be based on the *LF representation* (= *LF*) in (2a), but that of the QP_{Obj} over the QP_{Sub} is not based on the LF in (2b); hence, the former may emerge through LF compositional computation, but the latter does not.

(1)   [… QP_{Sub} [… QP_{Obj} …]], where the QP_{Sub} and the QP_{Obj} are clause-mates

(2)   (Ψ stands for an element that denotes a one-place predicate)

   a. LF: [$_\Psi$ QP_{Sub} [$_\Psi$ QP_{Obj} [$_\Psi$ … t_{Sub} [… t_{Obj} …]]]]

   b. LF: [$_\Psi$ QP_{Obj} [$_\Psi$ QP_{Sub} [$_\Psi$ … t_{Sub} [… t_{Obj} …]]]]

Given that covert movement is a syntactic operation that can apply freely, it is reasonable to interpret the conclusion (that the wide scope reading of the QP_{Sub} over the QP_{Obj} may be based on (2a), but that of the QP_{Obj} over the QP_{Sub} is not based on (2b)) as indicating that there is some independent principle that rules in (2a), but rules out (2b). And the isomorphism principle in (3) is one good candidate for such a principle, which

is originally argued in Huang 1982 on the basis of the scope interaction among QPs in Chinese, and in effect, in Hoji 1985 using similar phenomena in Japanese.[1]

(3) Isomorphism Principle

When two noun phrases undergo covert movement, their c-command relation prior to the movement cannot be altered.

The aim of this chapter is to motivate the isomorphism principle in (3) on independent grounds, thereby further confirming the thesis that there are two sources of the scope interactions among QPs.

The following sections are organized as follows. In Sections 4.2 and 4.3, I will demonstrate that the isomorphism principle holds (i) between a QP and a referential expression and (ii) between a QP and an NP plus an adnominal 'focus-sensitive' particle such as *only* and *even*. Each section consists of (i) an experimental design where I spell out how we can make sure the elements under examination undergo covert movement and how we can identify their c-command relation after the movement and (ii) a demonstration of the isomorphism principle. Both sections are based on Japanese empirical materials. In Section 4.4, I will conclude with a summary and a small remark on the nature of the isomorphism principle.

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[1] The original intuition of the isomorphism principle is found in Reihart 1976, who puts forth (i).

(i) (= Reinhart 1976 (39), p.191)
A logical structure in which a quantifier binding a variable x has wide scope over a quantifier binding a (distinct) variable y is a possible interpretation for a given structure S just in case in the surface structure of S the quantified expression corresponding to y is in the (c-command) domain of the quantified expression corresponding to x.

4.2. Between a QP and a referential expression[2]

In this section, I demonstrate that the isomorphism principle holds between a QP and a referential expression.

4.2.1. Experimental design

To demonstrate that the isomorphism principle holds between a QP and a referential expression, we need an environment where both of the elements undergo covert movement and their c-command relation after the movement can be examined, provided that their c-command relation prior to the movement is identified on an independent ground. I claim that *CM-comparatives*, exemplified in (4), which we have discussed in Chapter 3:Section 3.2.1, serve as such an environment.[3]

(4)   (= Chapter 3 (7))

$[_{IP} [_{AdvP} [_{CP}$ John-ni yorimo] sakini] $[_{IP}$ Kimura kyoozyu-ga   Bill-ni
            John-DAT than   early   Kimura professor-NOM Bill-DAT

Mary-o   syookaisita]] (to siyoo).
Mary-ACC introduced   that suppose

'(Suppose that) $[_{IP} [_{IP}$ Prof Kimura introduced Mary to Bill] $[_{AdvP}$ earlier $[_{CP}$ than to John]]].'

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[2]   This section is mostly based on Hayashishita 2003.

[3]   As mentioned in Chapter 3, FN 8, the NPs that serve the locus of comparison in a CM-comparative must be dative-marked (or marginally accusative-marked). For this reason, we will only consider CM-comparatives in which the locus NPs are dative-marked.

First of all, as in Chapter 3:Section 3.2.1, I adopt for CM-comparatives the LF copying analysis put forth by Hoji (1998b), and assume that (4), for example, is analyzes as (5).[4, 5]

(5)　　　(= Chapter 3 (8))

　　a. Before *to Bill* (the [L]NP of the antecedent clause) raises

　　　[IP [AdvP [CP to John [C' [IP　　ec　　] than]] early] [IP Prof. Kimura introduced Mary to Bill]]

　　b. After *to Bill* (the [L]NP of the antecedent clause) raises

　　　[IP [AdvP [CP to John [C' [IP　　ec　　] than]] early] [IP to Bill$_1$ [IP Prof. Kimura introduced Mary t$_1$]]]

　　c. After LF copying takes place　(= LF)

　　　[IP [AdvP [CP to John$_1'$ [C' [IP Prof. Kimura introduced Mary t$_1'$] than]] early] [IP to Bill$_1$ [IP Prof. Kimura introduced Mary t$_1$]]]

Under this analysis, the NP that serves as the locus of comparison in the antecedent clause must move out of the IP in which it originates (i.e., must undergo *constituent raising* in the sense of Reinhart 1991), so as to avoid non-constituent copying. We can therefore ensure that a referential expression undergoes covert movement when it serves as the locus of comparison in the antecedent clause. For convenience, as in Chapter 3, I

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[4]　The choice between LF copying and PF deletion does not affect any of the ensuring discussions. See also FN 11 and FN 12 in Chapter 3.

[5]　As mentioned in Chapter 3:Section 3.2.1, Hoji claims this analysis based on the assumption that the comparative clause of a CM-comparative is identical to its antecedent clause at LF, except the NPs that serve as the locus of comparison, which he independently substantiates on the basis of various kinds of bound variable anaphora (cf. Hoji 1998b:Section 3.3, and Hoji 2002:Sections 3.4, 4.2, and 5.2), see Chapter 3, FN 9. See also the quantifier scope based argument for this analysis I put forth in Chapter 3:Section 3.2.1.

will refer to the NPs that serve as the locus of comparison as *locus NPs* or simply

^{L}*NPs*, e.g., *John* and *Bill* in (4).

Let us now consider how we can make sure that a QP undergoes covert movement in a CM-comparative. Suppose that the antecedent clause of a CM-comparative contains a QP as one of its major constituents but not as the locus NP. In this situation, we can reasonably assume that the QP moves whenever it bears clausal scope. Let me explain why such is the case. It is argued in Chapter 3 that there are two ways for a QP to bear clausal scope: through LF compositional computation (i.e., through covert movement) and due to MINOR, an extra-grammatical operation. (Let us assume that the two ways are the only ways.) But for a QP to take clausal scope by means of MINOR, all of the clause-mates of the QP must be in an A-position (the conclusion drawn from the discussions in Chapter 3:Sections 3.3 and 3.5.2).[6] Given that for a CM-comparative the locus NP of the antecedent clause, which is a clause-mate of the QP, cannot stay in an A-position, the option of the scope taking due to MINOR is excluded. Hence, we can ensure that when the QP bears clausal scope, it undergoes covert movement.

We have so far concluded that the locus NP of the antecedent clause in a CM-comparative, even if it is a referential expression, undergoes covert movement, and so as a QP that is a clause-mate of the locus NP if it bears clausal scope. Now the question is how we can examine the c-command relation between the locus NP (when it is a referen-

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[6]   As in Chapter 3:Seciton 3.2.1, I adopt the definition of A-position in (i). See also FN 6 in Chapter 3.

(i)   (= Chapter 3 (6))
        A position α is an A-position if, and only if α is a theta position of a verb or a case position.

tial expression), and the QP under discussion, after they undergo covert movement. I claim that we can identify the c-command relation under discussion through the scope interaction between the QP and the AdvP containing the comparative clause.[7]

First, when a QP that is a major constituent of the antecedent clause takes scope above the AdvP, it is reasonable to assume that the QP c-commands the AdvP at LF (because the QP cannot bear clausal scope due to MINOR). In this situation, the QP must also c-command its clause-mate locus NP at LF, whether or not the isomorphism principle holds between the two, as illustrated in (6), where the copied IP is underlined.

(6)　　a.　$[_{IP}\ QP_j\ [_{IP}\ [_{AdvP}\ [_{CP}\ ^LNP_k\ [_{C'}\ [_{IP}\ \ldots\ t_j\ \ldots\ t_k\ \ldots]\ than]]\ early]\ [_{IP}\ ^LNP_k\ [_{IP}\ \ldots\ t_j\ldots\ t_k$

　　　　　$\ldots\ ]]]]$

　　　b.　$[_{IP}\ QP_j\ [_{IP}\ [_{AdvP}\ [_{CP}\ ^LNP_k\ [_{C'}\ [_{IP}\ \ldots\ t_k\ \ldots\ t_j\ \ldots]\ than]]\ early]\ [_{IP}\ ^LNP_k\ [_{IP}\ \ldots\ t_k\ldots\ t_j$

　　　　　$\ldots\ ]]]]$

Second, when a QP that is a major constituent of the antecedent clause takes scope below the AdvP (i.e., when we can safely assume that the QP is c-commanded by the AdvP at LF), the QP must be c-commanded by its clause-mate locus NP at LF, irrespective of the isomorphism principle, as schematized in (7). Otherwise, the QP-trace in the comparative clause (i.e., t_j) could not be bound, as illustrated in (8).

(7)　　a.　$[_{IP}\ [_{AdvP}\ [_{CP}\ ^LNP_k\ [_{C'}\ [_{IP}\ QP_j\ [_{IP}\ \ldots\ t_j\ \ldots\ t_k\ \ldots]]\ than]]\ early]\ [_{IP}\ ^LNP_k\ [_{IP}\ QP_j\ [_{IP}\ \ldots$

　　　　　$t_j\ \ldots\ t_k\ \ldots\ ]]]]$

　　　b.　$[_{IP}\ [_{AdvP}\ [_{CP}\ ^LNP_k\ [_{C'}\ [_{IP}\ QP_j\ [_{IP}\ \ldots\ t_k\ \ldots\ t_j\ \ldots]]\ than]]\ early]\ [_{IP}\ ^LNP_k\ [_{IP}\ QP_j\ [_{IP}\ \ldots$

　　　　　$t_k\ \ldots\ t_j\ \ldots\ ]]]]$

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[7]　As in Chapter 3, I assume that the AdvP in a CM-comparative is an existential quantifier over a degree variable plus its restrictor, cf. Larson 1988.

(8) a. *$[_{IP} [_{AdvP} [_{CP} {}^{L}NP_k [_{C'} [_{IP} \ldots t_j \ldots t_k \ldots]$ than]] early] $[_{IP} QP_j [_{IP} {}^{L}NP_k [_{IP} \ldots t_j \ldots$

   $t_k \ldots]]]]$

b. *$[_{IP} [_{AdvP} [_{CP} {}^{L}NP_k [_{C'} [_{IP} \ldots t_k \ldots t_j \ldots]$ than]] early] $[_{IP} QP_j [_{IP} {}^{L}NP_k [_{IP} \ldots t_k \ldots t_j$

   $\ldots]]]]$

In summary, the generalizations in (9) hold for CM-comparatives. Hence, we can identify the post-movement c-command relation between the locus NP of antecedent clause, which is a referential expression, and a QP that is a clause-mate of the locus NP through the scope interaction between the QP and the AdvP.

(9)   Generalizations for CM-comparatives

   Let α be a QP that is a major constituent of the antecedent clause, and β its

   clause-mate locus NP.

   a. α can take scope above the AdvP iff α c-commands β at LF.

   b. α can take scope below the AdvP iff α is c-commanded by β at LF.

4.2.2. Evidence for isomorphism principle

We can now demonstrate that the isomorphism principle holds between a referential expression and a QP, using CM-comparatives. If the movement of the locus NP of the antecedent clause and that of its clause-mate QP are subject to the isomorphism principle, we obtain (10). From (9) and (10), the generalizations in (11) are derived.

(10)   Let α be a QP that is a major constituent of the antecedent clause, and β its

   clause-mate locus NP.

   a. α can c-commands β at LF iff α c-commands β prior to covert movement.

b. α can be c-commanded by β at LF iff α is c-commanded by β prior to covert movement.

(11)   Generalizations for CM-comparatives with Isomorphism Principle

Let α be a QP that is a major constituent of the antecedent clause, and β its clause-mate locus NP.

a. α can take scope above the AdvP iff α c-commands β prior to covert movement.

b. α can take scope below the AdvP iff α is c-commanded by β prior to covert movement.

If the isomorphism principle is irrelevant for the two elements under discussion, on the other hand, the generalizations in (12) should hold.

(12)   Generalizations for CM-comparatives without Isomorphism Principle

Let α be a QP that is a major constituent of the antecedent clause, and β its clause-mate locus NP.

a. α may take scope above the AdvP, whether or not α c-commands β prior to covert movement.

b. α may take scope below the AdvP, whether or not α is c-commanded by β prior to covert movement.

The following empirical materials, however, indicate that the generalizations in (11) can be maintained, while those in (12) cannot. First, consider the example in (13), which is a CM-comparative whose antecedent clause has the configuration of [QP-*ga* [^{L}NP-*ni* Verb]].

(13)　　　[IP [AdvP [CP John-ni　yorimo] sakini] [IP sanninizyoo-no　sensei-ga
　　　　　　　　　　John-DAT than　　　early　　　three:more-GEN　teacher-NOM

　　　　　Mary-ni　tikazuita]]　koto
　　　　　Mary-DAT approached　that

　　　　　'That [IP [IP three or more teachers approached Mary] [AdvP earlier [CP than
　　　　　John]]]'

Given that the NP$_1$ c-commands the NP$_2$ in the configuration of [NP$_1$-*ga* NP$_2$-*ni/o* Verb]

prior to covert movement (cf. Kuroda 1969/70, Hoji 1985, Hayashishita 2000b), we ex-

pect from the generalizations in (11) that (13) can give rise to the interpretation in (14a)

but not that in (14b). Under the generalizations in (12), on the other hand, we expect

that (13) may give rise to both of the interpretations. Our intuition confirms that (13) is

taken to mean (14a) but not (14b), indicating the generalizations in (11) must be adopted

over those in (12); in particular, (11b) can be maintained while (12b) cannot.

(14)　a.　The QP>AdvP reading

　　　　There are three or more xs, x is a teacher such that the time at which x

　　　　approached Mary precedes the time at which x approached John.

　　　b.　The AdvP>QP reading

　　　　The time (span) at which there are three or more xs, x is a teacher such that x

　　　　approached Mary precedes the time (span) at which there are three or more ys,

　　　　y is a teacher such that y approached John.

　　　To truth-conditionally substantiate the intuition under discussion, we may consider

the following situations.

(15)　　　There are six and only six teachers, A, B, C, D, E, and F.

　　　a.　Situation 1

　　　　A and B approached Mary at the time (span) Δ_1 and John at the time Δ_2.

C and D approached Mary at the time (span) Δ_3 and John at the time Δ_4.

E and F did not approach Mary or John.

$\Delta_1 \neq \Delta_3$, $\Delta_2 \neq \Delta_4$, and Δ_1 and Δ_3 precedes Δ_2 and Δ_4 respectively.

b. Situation 2

A, B, C, and D approached Mary at the time (span) Δ_1, but did not approach John.

C, D, E, and F approached John at the time (span) Δ_2, but did not approach Mary.

Δ_1 precedes Δ_2.

If (13) is taken to mean (14a), we should be able to truthfully utter it in (15a), but not in (15b). If the meaning of (13) is (14b), on the other hand, (13) is true in (15b), but not in (15a). The fact seems to be that (13) can be truthfully uttered only in (15a), substantiating the intuition that (13) can give rise to (14a), but not (14b), and indicating that the generalization in (11b) must be adopted over that in (12b).[8]

The examples in (16), which are with other types of QPs, further indicate that the generalizations in (11) must be adopted over those in (12). Their configurations are

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[8]   Incidentally, (i) gives rise to both (14a) and (14b), despite the fact that it minimally differs from (13) in regard to the absence of the case-marker attached to the NP in the comparative clause.

(i)   [$_{IP}$ [$_{AdvP}$ [$_{CP}$ John yorimo] sakini] [$_{IP}$ sanninizyoo-no sensei-ga   Mary-ni   tikazuita]] koto
                    John than   early   three:more-GEN teacher-NOM Mary-DAT approached that
            'That [$_{IP}$ [$_{IP}$ three or more teachers approached Mary] [$_{AdvP}$ earlier [$_{CP}$ than John]]]'

     This seems consistent with Hoji's (2002) analysis that the construction exemplified by (i) does not involve LF copying (or PF deletion) and the comparative clause contains a (covert) deep anaphor. If the deep anaphor in (i) is understood to be *the same set of three or more teachers approached x*, then the reading that emerges is analogous to (14a). On the other hand, if the deep anaphor is understood to be *three or more y, y is a teacher such that y approached x*, what emerges is analogous to (14b).

identical to that of (13), and they can give rise to the QP>AdvP reading, but not the

AdvP>QP reading.

(16) a. [$_{IP}$ [$_{AdvP}$ [$_{CP}$ Kimura sensei-ni   yorimo] sakini] [$_{IP}$ oozei-no   gakusei-ga
                         Kimura teacher-DAT than   early   many-GEN student-NOM

       Tanaka sensei-ni   aisatusita]] to   siyoo.
       Tanaka teacher-DAT greeted   that suppose

       'Suppose that [$_{IP}$ [$_{IP}$ many students greeted Prof. Tanaka] [$_{AdvP}$ earlier [$_{CP}$ than Prof. Kimura]]].'

    b. [$_{IP}$ [$_{AdvP}$ [$_{CP}$ Toyota-ni   yorimo] sakini] [$_{IP}$ 15%izyoo-no kyoozyu-ga
                         Toyota-DAT than   early   15%:more-GEN professor-NOM

       Nissan-ni   gakusei-o   syookaisita]] to   siyoo.
       Nissan-DAT student-ACC introduced   that suppose

       'Suppose that [$_{IP}$ [$_{IP}$ 15% or more of the professors introduced students to Nissan] [$_{AdvP}$ earlier [$_{CP}$ than to Toyota]]].'

    Comparing (13) with (17), we receive further support for the generalization in

(11b).

(17)   [$_{IP}$ [$_{AdvP}$ [$_{CP}$ John-ni   yorimo] sakini] [$_{IP}$ Mary-ni   sanninizyoo-no sensei-ga
                         John-DAT than   early   Mary-DAT three:more-GEN teacher-NOM

       tikazuita]]   koto
       approached that

       '(Lit.) That [$_{IP}$ [$_{IP}$ Mary, three or more teachers approached] [$_{AdvP}$ earlier [$_{CP}$ than John]]]'

(17) minimally differs from (13) such that the word order between the subject QP and

the locus NP is 'scrambled' in the antecedent clause. Nevertheless, (17) can give rise to

the AdvP>QP reading in (14b), which (13) lacks, in addition to the QP>AdvP reading in

(14b). Given the assumption that the NP$_2$ can c-command, or be c-commanded by, the

NP$_1$ in the configuration [NP$_2$-*ni/o* NP$_1$-*ga* Verb], prior to covert movement (cf., Hoji

1985, Saito 1992, and Ueyama 2002, among others), the contrast between (13) and (17)

with regard to the availability of the AdvP>QP reading in (14b) is fully consistent with (11b), but not with (12b).

We now turn to a demonstration that the generalization in (11a) must be adopted over that in (11b). Consider the example in (18), which is a CM-comparative whose antecedent clause has the configuration of [NP-*ga* [^{L}NP-*ni* [QP-*o* Verb]]].

(18)   [$_{IP}$ [$_{AdvP}$ [$_{CP}$ John-ni yorimo] sakini] [$_{IP}$ Kimura kyoozyu-ga   Mary-ni
                        John-DAT than   early   Kimura professor-NOM Mary-DAT

         mittuizyoo-no   kaisya-o   syookaisita]] koto
         three:more-GEN company-ACC introduced   that

         '(Lit.) That [$_{IP}$ [$_{IP}$ Prof. Kimura introduced to Mary three or more companies]
         [$_{AdvP}$ earlier [$_{CP}$ than to John]]]'

Under the assumption that the NP$_2$ c-commands the NP$_3$ in the configuration [NP$_1$-*ga* NP$_2$-*ni* NP$_3$-*o* Verb], prior to covert movement (cf. Hoji 1985 and Hayashishita 2000b), the generalizations in (11) leads us to expect that (18) can give rise to the AdvP>QP reading in (19b), but not the QP>AdvP reading in (19a). Under the generalizations in (12), on the other hand, we expect that (18) may give rise to both readings. The fact seems to be that (18) can be taken to mean (19b), but not (19a), indicating that (11) can be maintained but not (12), in particular, (11a) must be adopted over (12a).

(19)   a. The QP>AdvP reading

           There are three or more *x*s, *x* is a company such that the time at which Prof.

           Kimura introduced *x* to Mary precedes the time at which Prof. Kimura

           introduced *x* to John.

       b. The AdvP>QP reading

The time (span) at which there are three or more xs, x is a company such that Prof. Kimura introduced x to Mary precedes the time (span) at which there are three or more ys, y is a company such that Prof. Kimura introduced y to John.

The intuition under discussion is, for example, substantiated by the fact that (18) can be truthfully uttered in (20b), but not in (20a) (since (19a) is true in (20a), but false in (20b) while the converse holds for (19b)).[9]

(20)   There are six and only six companies, A, B, C, D, E, and F.

a. Situation 1

Prof. Kimura introduced A and B to Mary at the time (span) Δ_1, and to John at the time Δ_2, and C and D to Mary at the time (span) Δ_3, to John at the time Δ_4, but did not introduce E and F to Mary or John.

$\Delta_1 \neq \Delta_3$, $\Delta_2 \neq \Delta_4$ and Δ_1 and Δ_3 precede Δ_2 and Δ_4 respectively.

b. Situation 2

Prof. Kimura introduced A, B, C, and D to Mary at the time (span) Δ_1 but did not introduced them to John, and introduced D, E, and F to John at the time (span) Δ_2 but did not introduce them to Mary.

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[9]   (i) contrasts with (18) in giving rise to both (19a) and (19b), and this is not surprising for the reason mentioned in FN 8.

(i)   [$_{IP}$ [$_{AdvP}$ [$_{CP}$ John yorimo] sakini] [$_{IP}$ Kimura kyoozyu-ga   Mary-ni   mittuizyoo-no
                  John than   early   Kimura professor-NOM Mary-DAT three:more-GEN
         kaisya-o   syookaisita]] koto
         company-ACC introduced   that
         '(Lit.) That [$_{IP}$ [$_{IP}$ Prof. Kimura introduced to Mary three or more companies] [$_{AdvP}$ earlier [$_{CP}$ than John]]]'

Δ_1 precedes Δ_2.

We can also provide support for the generalization in (11a), using other types of QPs. For instance, the sentences in (21), which have the same configuration as that in (18), can give rise to the AdvP>QP reading, but not the QP>AdvP reading.

(21) a. [IP [AdvP [CP Toyota-ni yorimo] sakini] [IP Kimura sensei-ga   Nissan-ni
                    Toyota-DAT than   early   Kimura teacher-NOM Nissan-DAT

     oozei-no gakusei-o   suisensita]]   koto
     many-GEN student-ACC recommended that

     '(Lit.) That [IP [IP Prof. Kimura recommended to Nissan many students] [AdvP
     earlier [CP than to Toyota]]]'

   b. [IP [AdvP [CP John-ni   yorimo] sakini] [IP Kimura sensei-ga   Mary-ni
                    John-DAT than   early   Kimura teacher-NOM Mary-DAT

     10-satu-no hon-o   kasiataeta]] koto
     10-CL-GEN book-ACC lent   that

     '(Lit.) That [IP [IP Prof. Kimura lent to Mary 10 books] [AdvP earlier [CP than to
     John]]]'

Furthermore, note that (18) contrasts with (22) in which the order of the QP and the locus NP in the antecedent clause is 'scrambled'; the latter can give rise to the QP>AdvP reading in (19a), as well as the AdvP>QP reading in (19b).

(22)   [IP [AdvP [CP John-ni   yorimo] sakini] [IP Kimura kyoozyu-ga   mittuizyoo-no
                      John-DAT than   early   Kimura professor-NOM three:more-GEN

     kaisya-o   Mary-ni   syookaisita]] koto
     company-ACC Mary-DAT introduced   that

     'That [IP [IP Prof. Kimura introduced three or more companies to Mary] [AdvP
     earlier [CP than to John]]]'

Under the assumption that the NP_3 can c-command, or be c-commanded by, the NP_2 in the configuration of [NP_1-*ga* NP_3-*o* NP_2-*ni* Verb], prior to covert movement (cf. Hoji

1985 and Kitagawa 1994), this contrasts can be nicely accounted for under the generalization in (11a), but not under that in (12a).[10]

We have thus demonstrated that the generalizations in (11), repeated here, hold for CM-comparatives.

(11)   Generalizations for CM-comparatives with Isomorphism Principle

Let α be a QP that is a major constituent of the antecedent clause, and β its

clause-mate locus NP.

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[10]   To argue for the generalization in (11a) over that in (12a), I have utilized CM-comparatives whose antecedent clause has the configuration of [NP-*ga* [^{L}NP-*ni* [QP-*o* Verb]]], adopting Hoji's (1985) generalization that the NP_2 c-commands the NP_3 in the configuration of [NP_1-*ga* NP_2-*ni* NP_3-*o* Verb], prior to covert movement. Although the Hoji generalization is challenged by Kitagawa (1994) and Miyagawa (1997), Hayashishita (2000b) demonstrates that (i) the generalizations they put forth, which are based on quantifier scope and binding, emerge due to the failure to differentiate the two sources of scope interaction argued in Chapter 3, i.e. LF compositional computation and MINOR, and (ii) once we confine our attention to the LF-based scope interaction, the Hoji generalization is proven to be correct.
    We can also argue for (11a) over (12a), using CM-comparatives of different configurations. For example, consider (i).

(i)   [$_{IP}$ [$_{AdvP}$ [$_{CP}$ Kimura kyoozyu-ni   yorimo] sakini] [$_{IP}$ sootyoo-ga Tanaka kyoozyu-ni
                  Kimura professor-DAT than   early   dean-NOM Tanaka professor-DAT
         sanninizyoo-no gakusei-o   suisensaseta]]   koto
         three:more-GEN student-ACC made:recommend that
         'That [$_{IP}$ [$_{IP}$ the dean made Prof. Tanaka recommend three or more students] [$_{AdvP}$ earlier [$_{CP}$
         than Prof. Kimura]]]'

The antecedent clause of (i) has the configuration of [NP-*ga* [^{L}NP-*ni* [QP-*o* Verb]] CAUSE]. Since the locus NP and the QP are the subject and the object in the inner clause, we can safely assume that the former asymmetrically c-commands the latter. As expected from the generalization in (11a), but not from that in (12a), (i) can give rise to the Adv>QP reading, but not the QP>Adv reading.
    Furthermore, the CM-comparative in (ii), a scrambled counterpart of (i), contrasts with (i), in allowing the QP>Adv reading, in addition to the AdvP>QP reading. This contrast is once again nicely accounted for by the generalization in (11a), but not by that in (12a).

(ii)   [$_{IP}$ [$_{AdvP}$ [$_{CP}$ Kimura kyoozyu-ni   yorimo] sakini] [$_{IP}$ sootyoo-ga sanninizyoo-no gakusei-o
                  Kimura professor-DAT than   early   dean-NOM three:more-GEN student-
         ACC
         Tanaka kyoozyu-ni   suisensaseta]]   koto
         Tanaka professor-DAT made:recommend that
         'That [$_{IP}$ [$_{IP}$ the dean made Prof. Tanaka recommend three or more students] [$_{AdvP}$ earlier [$_{CP}$
         than Prof. Kimura]]]'

> a. α can take scope above the AdvP, iff α c-commands β prior to covert
>
> movement.
>
> b. α can take scope below the AdvP, iff α is c-commanded by β prior to covert
>
> movement.

Since (11) is derived straightforwardly from the inherent properties of CM-comparatives (i.e., (9)) and the assumption that the isomorphism principle holds between a QP and a referential expression, the above empirical materials are considered as a demonstration of the isomorphism principle between the two elements.[11]

4.3. Between a QP and an adnominal 'focus-sensitive' particle[12]

In this subsection, I demonstrate that the isomorphism principle holds also between a QP and an NP plus an *adnominal 'focus-sensitive' particle* (= FP), such as *only* and *even*.

4.3.1. Experimental design

As we did for the previous demonstration in Section 4.2, to demonstrate that the isomorphism principle holds between a QP and an NP plus an FP, we must first identify an environment where both of the elements undergo covert movement and their c-

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[11] One may wonder if the generalizations in (11) can be replaced with those in (i). But such is not the case, given the facts mentioned above in passing that (17) gives rise to the QP>AdvP reading, and (22) and (ii) in FN 10 allow the AdvP>QP reading.

(i) Generalizations for CM-comparatives with Linear Principle
   Let α be a QP that is a major constituent of the antecedent clause, and β its clause-mate locus NP.
   a. α can take scope above the AdvP, iff α precedes β prior to covert movement.
   b. α can take scope below the AdvP, iff α is preceded by β prior to covert movement.

[12] Some of the empirical materials in this section are also found in Hayashishita to appear.

command relation after the movement can be examined, provided that the c-command relation prior to the movement can be identified on an independent ground. To this end, I must make some preparatory remarks on 'focus-sensitive' particles before the introduction of an experimental design, using the next two subsections, i.e., Sections 4.3.1.1 and 4.3.1.2.

4.3.1.1. Two types of adnominal 'focus-sensitive' particles

In the generative tradition, 'focus-sensitive' particles in their adnominal uses (and adverbial uses) are uniformly treated as having the property of being a scope-bearing element, i.e. taking sentential scope, (henceforth scope properties), cf. Kuroda 1965, Peters & Karttunen 1979, Hoji 1985, Rooth 1985, and Büring & Hartmann 2001, among others. For example, the meaning of (23a) is assumed to be (23b).

(23) a. John greeted only Mary.

b. There is no one other than Mary such that John greeted him or her.

I claim, however, that some instances of FPs cannot be considered as having scope properties; therefore, there are (at least) two distinguished types of FPs. My arguments are based on empirical materials in Japanese (although the claim should hold also in languages other than Japanese) for the reason that the language distinguishes the two types of FPs morphologically.

In Japanese, adnominal 'focus-sensitive' particles can precede or follow a *case-marker or postposition* (henceforth simply *CM*), as illustrated in (24)-(25).[13]

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[13] The nominative-marker *ga* and the accusative-marker *o*, in contrast with the dative-marker *ni* and postpositions, can follow, but not precede, an FP, as illustrated in (i)-(ii).

(i) a. *?Kimura sensei-ga John-o-dake/sae suisensita (to siyoo).
Kimura teacher-NOM John-ACC-only/even recommended that suppose

(24) a. John-wa Kimura sensei-ni-dake/sae   aisatusita.
          John-TOP Kimura teacher-DAT-only/even greeted

      'John greeted only/even Prof. Kimura.'

    b. John-wa Kimura sensei-dake/sae-ni aisatusita.

      'John greeted only/even Prof. Kimura.'

(25) a. John-wa Kyoto daigaku-de-dake/sae enzetusita.
          John-TOP Kyoto university-at-only/even spoke

      'John spoke only/even at Kyoto University.'

    b. John-wa Kyoto daigaku-dake/sae-de enzetusita.

      '(Lit.) John spoke at only/even Kyoto University.'

In the following discussion, I will refer to the FP in an NP-CM-FP (e.g., (24a) and (25a))

as an *NP external FP* and to the FP in an NP-FP-CM (e.g., (24b) and (25b)) as an *NP*

internal FP.

When simple cases are considered, NP internal FPs and NP external FPs appear to

have scope properties on a par with each other. For example, both (26a) and (26b), for

example, can be truthfully uttered in (27a), but not in (27b).

(26) a. John-wa Kimura sensei-ni-dake   soodansita.
          John-TOP Kimura teacher-DAT-only consulted

      'John consulted only with Prof. Kimura.'

        '(Suppose that) Prof. Kimura recommended only/even John.'

    b. Kimura sensei-ga John-dake/sae-o suisensita (to siyoo).
        '(Suppose that) Prof. Kimura recommended only/even John.'

(ii) a. *Kimura sensei-ga-dake/sae   John-o   suisensita   (to siyoo).
           Kimura teacher-NOM-only/even John-ACC recommended that suppose
        '(Suppose that) only/even Prof. Kimura recommended John.'

    b. Kimura sensei-dake/sae-ga John-o suisensita (to siyoo).
        '(Suppose that) only/even Prof. Kimura recommended John.'

b. John-wa Kimura sensei-dake-ni soodansita.

'(Lit.) John consulted with only Prof. Kimura.'

(27)   There are two and only two professors, Profs. Kimura and Yamada.

a. Situation 1

John consulted with Prof. Kimura, but not with Prof. Yamada.

b. Situation 2

John consulted both with Prof. Kimura and with Prof. Yamada.

And one may take this observation as evidence that they both can be taken to mean (28),

the interpretation that is expected under the assumption that *dake* 'only' has scope

properties.

(28)   There is no one other than Prof. Kimura such that John consulted with him or

her.

Similarly, one may assume that both (29a) and (29b) can be understood to mean

(30), the interpretation expected under the assumption that *sae* 'even' has scope proper-

ties.

(29) a. John-wa Kimura sensei-ni-sae   soodansita.
         John-TOP Kimura teacher-DAT-even consulted

'John consulted even with Prof. Kimura.'

b. John-wa Kimura sensei-sae-ni soodansita.

'(Lit.) John consulted with even Prof. Kimura.'

(30)   Each person in a given context α has the property that John consulted with him

or her, and Prof. Kimura is the least likely person to have that property in α.

Once we consider more complex examples, however, the difference between NP-external FPs and NP-internal FPs emerges.[14] It seems that the former can be understood as having scope properties while the latter cannot. For example, consider the examples in (31) together with the situations in (32).

(31) a. John-wa Kimura sensei-ni-dake   email-de   soodansita.
       John-TOP Kimura teacher-DAT-only email-with consulted

    'John consulted only with Prof. Kimura through email.

   b. John-wa Kimura sensei-dake-ni email-de soodansita.

    '(Lit.) John consulted with only Prof. Kimura through email.'

(32)   There are two and only two professors, Profs. Kimura and Yamada.

   a.   Situation 1

        John consulted with Prof. Kimura through email and with Prof. Yamada

        through phone.

   b.   Situation 2

        John consulted with Prof. Kimura through email, but with no other person.

(31a) can be truthfully uttered in both of the situations. (32a) is a situation where John

consulted someone other than Prof. Kimura but Prof. Kimura is the only person that he

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[14]   Works in the functional grammar (e.g., Morita 1974 and Kuno & Monane 1979) observe that there are some semantic/functional differences between NP external FPs and NP internal FPs. Morita (1974), for example, points out that (i-a) is taken to mean that this disease can be cured by injection, but not by any other method; however, (i-b) can be used to indicate that this disease can be cured by injection alone (but something other than injection may also cure it). Sections 4.3.1.1 & 4.3.1.2 thus serve in effect as providing a theoretical characterization for the intuition reported by these works.

(i)   a. Kono byooki-wa tyuusya-de-dake   naoru.
          this   disease-TOP injection-with-only cure
          'This disease is cured only with injection.'

     b. Kono byooki-wa tyuusya-dake-de naoru.
          '(Lit.) This disease is cured with only injection.'

consulted through email, and (32b) is a situation where John consulted no one except Prof. Kimura. By contrast, (31b) can be true in (32b), but false in (32a). In other words, (31b) cannot be true if John consulted with someone other than Prof. Kimura even with something other than email. We can thus conclude that (31a), but not (31b), can be taken to mean (33), i.e., the interpretation we expect under the assumption that *dake* has scope properties.

(33)   There is no one other than Prof. Kimura such that John consulted with him or

          her through email.

A similar contrast can be observed with *sae* 'even'. For example, consider (34), together with the situations in (35).

(34) a. John-wa Kimura sensei-ni-sae   email-de soodansita.
          John-TOP Kimura teacher-DAT-even email-with consulted

          'John consulted even with Prof. Kimura through email.

      b. John-wa Kimura sensei-sae-ni email-de soodansita.

          '(Lit.) John consulted with even Prof. Kimura through email.

(35)   There are two and only two professors, Prof. Kimura and Yamada.

      a. Situation 1

          John consulted with both Prof. Kimura and Prof. Yamada though email. In

          general, Prof. Yamada is less likely to be consulted with than Prof. Kimura.

          However, Prof. Kimura dislikes email to the extent that he is less likely to be

          consulted with through email than Prof. Yamada.

b. Situation 2

John consulted with both Prof. Kimura and Prof. Yamada through email. In general, Prof. Kimura is less likely to be consulted with than Prof. Yamada. The situation is the same even when the consultation is though email.

(34a) can be truthfully uttered in both (35a) and (35b). (35a) is a situation where Prof. Kimura is generally more approachable to John than Prof. Yamada, but he is hard to approach through email. (35b) is a situation where it is always the case that Prof. Kimura is difficult to approach. (34b), by contrast, is true in (35b), but false in (35a). This indicates that (34a), but not (34b), can be taken to mean (36), i.e., the interpretation we expect under the assumption that *sae* 'even' has scope properties.

(36)   Each person in a given context α has the property that John consulted with him

         or her through email, and Prof. Kimura is the least likely person to have that

         property in α.

We can also demonstrate a similar contrast in the case where a given CM is a postposition. (37a), for example, can be true in both of the situations in (38); however, (37b) is true only in (38b).

(37) a. John-wa email-de-dake Kimura sensei-ni   renrakusita.
         John-TOP email-with-only Kimura teacher-DAT contacted

         'John contacted Prof. Kimura only through email.

      b. John-wa email-dake-de Kimura sensei-ni renrakusita.

         '(Lit.) John contacted with Prof. Kimura through only email.

(38)   There are two and only two methods of contacting people for John, email and

         telephone.

   a. Situation 1

       John used email, telephone, and fax to contact people. To contact Prof.

       Kimura, however, he used only email.

   b. Situation 2

       John used only email to contact people, and he contacted Prof. Kimura.

It is thus indicated that the meaning of (37a), but not that of (37b), can be (39), the inter-

pretation expected under the assumption that *dake* has scope properties.

(39)   There is no method other than email such that John contacted Prof. Kimura

         through it.

   Based on the set of the contrasts just observed (i.e., (i) (31a), but not (31b), can be

taken to mean (33), (ii) (34a), but not (34b), can be understood to mean (36), and (iii)

(37a), but not (37b), can be used to indicate (39)), I conclude that NP-external FPs can

have scope properties while NP-internal FPs cannot.

4.3.1.2. Theoretical assumptions

   Our interest is to demonstrate that the isomorphism principle holds between a QP

and an NP plus an FP. It is thus necessary to determine whether or not NP-external FPs

and/or NP-internal FPs can be used for the demonstration, i.e., whether or not we can

ensure that NP-external FPs and/or NP-internal FPs undergo covert movement and ex-

amine their positions after the movement. In this subsection, as a part of the determina-

tion processes, I will put forth analyses for NP-external FPs and NP-internal FPs.

   As noted above, works in the generative grammar uniformly treat 'focus-sensitive'

particles as having scope properties. Proposed analyses are thus meant to account for the

scope properties, and they are roughly divided into two types. One, exemplified by Ku-

roda 1965, Peters & Karttunen 1979, and Hoji 1985, among others, in effect assumes that an NP plus an FP undergoes covert movement (henceforth the QR analysis). The other, exemplified by Rooth 1985, 1992, and Buring & Hartmann 2001, is based on the theory of association of focus developed in Rooth 1985 (henceforth the Roothian analysis). Given the conclusion above that NP-external FPs can have scope properties while NP-internal FPs cannot, we must consider which should be adopted for NP-external FPs, the QR analysis or the Roothian analysis.[15, 16] We must, however, seek a new analysis for NP-internal FPs.

4.3.1.2.a. NP-external FPs

Let us begin with NP-external FPs. I will first briefly introduce the QR analysis and the Roothian analysis, along with their fundamental assumptions, and then argue that the QR analysis must be adopted over the Roothian analysis for NP-external FPs.

Proponents for the QR analysis adopt the assumptions in (40) or their notational variants.

(40)   Assumptions adopted by the QR analysis

　　　a. An NP plus an FP (e.g., *only Mary*) is an instance of a generalized quantifier,

　　　　i.e., of type $<et, t>$.

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[15]   One may wonder if the scope properties associated with NP-external FPs are due to MINOR, an extra-grammatical scope-taking strategy. I assume without further discussion that such is not the case, since (i) one of the necessary conditions for a QP α to take clausal scope due to MINOR is that the speaker refers to a specific group with α, and (ii) an NP plus an FP, both NP-external and NP-internal ones, is difficult to understand as having such a property.

[16]   Having excluded the possibility that the scope properties associated with NP-external FPs are due to MINOR, an extra-grammatical scope taking strategy, see FN 15, I assume without further discussion that the scope properties under discussion emerge solely based on LF compositional computation. Assuming that the QR analysis and the Roothian analysis are the only viable options, I will justify myself to chose one for NP-external FPs by rejecting the other.

    b. An NP plus an FP (e.g., *only Mary*) undergoes QR for interpretive

       purposes, i.e., to avoid a type mismatch problem.

Under this analysis, (41a), for example, is represented as (41b) at LF. The mean-

ing of *only Mary* is roughly (42a), and compositionally combining *only Mary* and *John*

kissed t, the scope properties of *only* is derived as in (42b).

(41)   a. PF: John kissed only Mary

     b. LF: [$_{IP}$ only Mary$_1$ [$_{IP}$ John kissed t$_1$]]

(42)   a. ⟦ [$_{DP}$ only Mary] ⟧ = the set of all properties p which no one other than Mary

       has

     b. ⟦ [$_{IP}$ only Mary$_1$ [$_{IP}$ John kissed t$_1$]] ⟧ = the set of worlds in which the property

       of John's kissing is one which no one other than Mary has

We now turn to the Roothian analysis whose crucial assumptions are summarized

in (43).[17]

(43)   Assumptions adopted by the Roothian analysis

     a. No element needs to undergo QR.

     b. *Focus* is a grammatical concept: focused elements are marked at LF with 'F',

       which is realized as a pitch accent on the main stress-bearing syllable.

     c. Each node is interpreted with its *ordinary semantic value* and its *focus*

       semantic value.

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[17] I acknowledge that the clear exposition by Büring & Hartmann (2001) facilitated my understanding of the Roothian analysis.

  i. The focus semantic value of any node X, $[\![X]\!]^f$, consists of a set of alternatives to its ordinary semantic value $[\![X]\!]$.

  ii. The set of alternatives is derived by substitution of the meaning of the focused constituent by alternatives.

  iii. If X contains no 'F' at all, $[\![X]\!]^f$ is the singleton set containing X's ordinary semantic value, e.g., $[\![\textit{kissed}]\!]^f = \{[\![\textit{kissed}]\!]\}$

To illustrate how this analysis derives the scope properties associated with FPs, let us consider (44), where the capitalization of *Mary* indicates that it receives a pitch accent on the main stress-bearing syllable.

(44) a. PF: John kissed only MARY.

   b. LF: [$_{IP}$ John kissed only Mary$_F$]

First of all, the phonetic form in (44a) corresponds to the LF in (44b), where 'F'-making is placed on *Mary*. As mentioned above, this analysis crucially assumes that each node is interpreted with its ordinary semantic value and its focus semantic value, i.e., (43c). The ordinary and focus semantic values of *Mary*, for example, are (45a) and (45b), respectively.

(45) a. $[\![$ [$_{DP}$ Mary$_F$] $]\!]$ = the set of all properties p which Mary has.

   b. $[\![$ [$_{DP}$ Mary$_F$] $]\!]^f$ = the set of all sets P of properties p such that there is an alternative to Mary who has the properties p in P.

Assuming the interpretive rule for *only* in (46), which manipulates ordinary and focus semantic values, we can derive the ordinary and focus semantic values of *only Mary* as in (47a) and (47b), respectively.

(46)   The interpretive rule for *only* (= Büring & Hartmann 2001 (31), p.248)

If *A* is of type <α, t>, *only A* is of type <α, t>, too, and ⟦*only A*⟧ is the set of all

B of type α such that *B* has the property ⟦*A*⟧ (i.e., *B* ∈ ⟦*A*⟧), and no other

property that is an alternative to that (i.e., in ⟦*A*⟧^{f}); ⟦*only A*⟧^{f} = {⟦*only A*⟧}.

(47)   a. ⟦ [$_{DP}$ only Mary$_F$] ⟧ = the set of all properties p that Mary has and that no

alternative to Mary has.

b. ⟦ [$_{DP}$ only Mary$_F$] ⟧^{f} = ⟦ [$_{DP}$ only Mary$_F$] ⟧

And, compositionally combining the semantic values of *only Mary* and those of the rest

of the sentence, the scope properties of *only* can be derived as in (48).

(48)   a. ⟦ [$_{IP}$ John kissed only Mary$_F$] ⟧ = the set of worlds in which the property of

John's kissing is one that Mary has and that no alternative to Mary has.

b. ⟦ [$_{IP}$ John kissed only Mary$_F$] ⟧^{f} = ⟦ [$_{IP}$ John kissed only Mary$_F$] ⟧

I claim, however, that the Roothian analysis cannot be adopted for Japanese for

two reasons.[18] As mentioned above, the analysis under discussion manipulates ordinary

and focus semantic values. Informally speaking, focus semantic values of a given

proposition α is a set of alternative propositions, and it is crucially assumed that the form

of alternative propositions is determined by the location of focus, i.e., 'F'-marking at LF.

As I demonstrate below, this very assumption seems not to be valid in Japanese, al-

though it appears to be correct in English.

Let us first consider the English sentence in (49a).

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[18]   The third reason is given in Section 4.3.2, FN 23.

(49) a. PF: Prof. Kimura introduced JOHN to Mary.

b. LF: Prof. Kimura introduced John$_F$ to Mary.

Under the Roothian analysis, when (49a) is uttered, its LF must be (49b), and the form of the alternative propositions must be (50). This intuition is supported by the literature such as Rooth 1985, and it is compatible with the fact that (49a) can be felicitously uttered in response to the question in (51).

(50)   {p | ∃x (person(x) ∧ p = Prof. Kimura introduced x to Mary)}

I.e., {that Prof. Kimura introduced Ken to Mary,

that Prof. Kimura introduced Jim to Mary,

that Prof. Kimura introduced Bill to Mary, …}

(51)   Who did Prof. Kimura introduce to Mary?

Japanese does not work in the same way, however. Under the Roothian analysis, when (52a) is uttered, its LF must be (52b) and the form of the alternative propositions must be (50).

(52) a. PF: Kimura sensei-wa JOHN-o Mary-ni syookaisita.
           Kimura teacher-TOP John-ACC Mary-DAT introduced

'Prof. Kimura introduced JOHN to Mary.'

b. LF: Kimura sensei-wa John$_F$-o Mary-ni syookaisita.

It seems, however, that when (52a) is uttered, the alternative set cannot be (50). This intuition is confirmed by the fact that (52a) cannot be a felicitous answer to the question in (53). Intuitively, the repetition of *Mary* makes the sentence inappropriate.

(53)   Kimura sensei-wa dare-o   Mary-ni   syookaisita no.
        Kimura teacher-TOP who-ACC Mary-DAT introduced Q

'Who did Prof. Kimura introduce to Mary?'

When (52a) is uttered, the possible alternative sets seem to be the ones in (54) instead.

(54)   a. $\{p \mid \exists x \, \exists y \, (\text{person}(x) \wedge \text{person}(y) \wedge p = \text{Prof. Kimura introduced } x \text{ to } y)\}$

I.e., {that Prof. Kimura introduced Ken to Jane,

that Prof. Kimura introduced Jim to Susan,

that Prof. Kimura introduced Bill to Kati…}

b. $\{p \mid \exists x \, (\text{person}(x) \wedge p = \text{Prof. Kimura introduced } x \text{ to someone})\}$

I.e., {that Prof. Kimura introduced Ken to someone,

that Prof. Kimura introduced Jim to someone,

that Prof. Kimura introduced Bill to someone, …}

This intuition is compatible with the fact that (52a) can be felicitously uttered in response to the questions in (55).

(55)   a.   Kimura sensei-wa   dare-o   dare-ni   syookaisita no.
Kimura teacher-TOP who-ACC who-DAT introduced   Q

'Who did Prof. Kimura introduce to whom?'

b.   Kimura sensei-wa dare-o syookaisita no.

'Who did Prof. Kimura introduce (to someone)?'

Based on the above observations, I conclude (56), and maintain that the Roothian analysis cannot be adopted for NP-external FPs in Japanese.

(56)   In Japanese, the form of the alternative set is NOT determined by focus, i.e.,'F'-marking at LF.

One may counter my conclusion, by saying that focus, 'F'-marking at LF, may not be realized as a pitch accent on the main stress-bearing syllable in Japanese.[19] Admittedly, this possibility remains. But, how can we know the location of focus, 'F'-marking at LF, then? To answer the question is rather difficult, to say the least. Even if one can provide a reasonable answer to this, the Roothian analysis is yet to overcome another counterargument, to which I will come directly.

First, observe that (57a) is infelicitous while (57b) is felicitous, despite the fact that they only differ from each other with respect to the location of the FP.

(57)　a.　#Boku-wa kimi-ni-dake meguriau tameni　　umaretekita.
　　　　　　I-TOP　　you-DAT-only meet　　in:order:to　was:born

　　'I was born in order to meet only you.'

　　b.　Boku-wa kimi-dake-ni meguriau tameni umaretekita.

　　'I was born in order to meet only you.'

I interpret this contrast as indicating (58), for the embedded scope reading is infelicitous while the matrix scope reading is felicitous, as indicated in (59).

(58)　a.　The scope of NP-external FPs is clause-bounded.

　　b.　NP-internal FPs may appear to take scope beyond the clause they originate in.

(59)　a.　The embedded scope reading

　　　#I was born so that I meet no one other than you.

　　b.　The matrix scope reading

　　　There is no one other than you that I was born to meet (i.e., my birth is for

　　　you!)

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[19]　I thank John Whitman for making me aware of this possibility (p.c. August 2003).

We can also demonstrate a similar contrast, varying the location of an FP with respect to a postposition, as illustrated in (60), and the contrast between (60a) and (60b) confirms the generalization in (58), since the embedded scope reading is odd while the matrix reading is felicitous, as indicated in (61).

(60) a. #John-wa Tokyo-de-dake odoru koto-o   yumemiteiru.
          John-TOP Tokyo-at-only   dance that-ACC is:dreaming

      'John is dreaming of dancing only at Tokyo.'

      b. John-wa Tokyo-dake-de odoru koto-o yumemiteiru.

      '(Lit.) John is dreaming of dancing at only Tokyo.'

(61) a. The embedded scope reading

      #John is dreaming that there is no place other than Tokyo that he dances at.

      b. The matrix scope reading

      There is no place other than Tokyo that John is dreaming to dance at.

I claim that the Roothian analysis cannot account for the generalization that the scope of NP-external FPs is clause-bounded, since in order to derive the scope properties of FPs, this analysis manipulates the type-shifting operation (e.g., the ordinary semantic value of *Mary* is not of type $<e>$, but of type $<et, t>$, see (45) above), rather than covert movement.[20] One may stipulate that an NP plus an NP-external FP undergoes focus movement and such movement is clause-bounded. But such a stipulation forces us to assume that an NP plus an NP-internal FP raises for the same reason, and the generalizations in (58), the contrast between NP-external and NP-internal FPs with regard to the

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[20] I thank John Whitman for pointing out to me (p.c. August 2003) that this generalization speaks against the Roothian analysis.

locality effects, cannot be accounted for. Hence, I reject the Roothian analysis for NP-external FPs.

The QR analysis, on the other hand, does not face the problems the Roothian analysis fails to overcome. First, it need not assume focus, 'F'-marking at LF, to be a grammatical notion. Second, it can naturally account for the generalization that the scope of NP-external FPs is clause-bounded, provided that QR is clause-bounded. I thus adopt the QR analysis for NP-external FPs. For the sake of concreteness, I provide two sets of sample derivations in (62)-(65).

(62) a. PF: John-ga Mary-ni-dake soodansita (koto).

'(That) John consulted only with Mary.'

b. LF: [$_{IP}$ Mary-ni-dake$_1$ [$_{IP}$ John-ga t$_1$ soodansita]]

(63) a. ⟦ Mary-ni-dake⟧ = the set of all properties p which no one other than Mary has.

b. ⟦ John-ga Mary-ni-dake soodansita ⟧ = the set of worlds in which the property of John's consulting is one which no one other than Mary has

(64) a. PF: John-ga Mary-ni-sae soodansita (koto).

'(That) John consulted even with Mary.'

b. LF: [$_{IP}$ Mary-ni-sae$_1$ [$_{IP}$ John-ga t$_1$ soodansita]]

(65) a. ⟦John-ni-sae⟧ = the set of all properties p which each person in a given context α has and John is the least likely person to have in α.

b. ⟦ John-ga Mary-ni-dake soodansita ⟧ = the set of worlds in which the

property of John's consulting is one which each person in a given context α

has and John is the least likely person to have in α.

4.3.1.2.b. NP-internal FPs

Let us now turn to the analysis of NP-internal FPs. As noted above, neither the

QR analysis nor the Roothian analysis can be adopted for NP-internal FPs, for both are

meant to capture the scope properties of FPs, and NP-internal FPs cannot be considered

as having scope properties (though they appear to have them when simple cases are con-

sidered). We thus need a new analysis for NP-internal FPs.

I claim that the phonetic string in (66a), for example, is represented as (66b) at LF,

and interpreted as in (67). Note that we must assume that *Mary-dake-ni* 'with only Mary'

stays in situ in order to account for the generalization in (58b); see also FN 21 for an-

other piece of evidence in support of the assumption.

(66)   a. PF: John-ga Mary-dake-ni soodansita (koto).

'(Lit.) (That) John consulted with only Mary.'

b. LF: [$_{IP}$ John-ga Mary-dake-ni soodansita]

(67)   a. ⟦Mary-dake-ni⟧ = Mary, who is the unique individual that satisfies the

contextually most salient proposition under consideration.

b. ⟦John-ga Mary-dake-ni soodansita⟧ = the set of worlds in which John consulted

with Mary, who is the unique individual that satisfies the contextually most

salient proposition under consideration.

Similarly, I maintain that the phonetic string in (68a) is represented as (68b) at LF, and

interpreted as in (69).

(68)   a.   PF: John-ga Mary-sae-ni soodansita (koto).

'(Lit.) (That) John consulted with even Mary.'

b.   LF: [_IP John-ga Mary-sae-ni soodansita]

(69)   a.   ⟦Mary-sae-ni⟧ = Mary, who is the least likely individual that satisfies the contextually most salient proposition under consideration.

b.   ⟦John-ga Mary-sae-ni soodansita⟧ = the set of worlds in which John consulted with Mary, who is the least likely individual that satisfies the contextually most salient proposition under consideration.

Notice that the proposed analysis can account for the apparent scope properties of NP-internal FPs. In the cases of (66a) and (68a), assuming the contextually most salient proposition to be *John consulted with x*, the derived meanings become indistinguishable from the meanings of the NP-external FPs counterparts. Furthermore, the observations regarding (57b) and (60b) above that NP-internal FPs appear to take scope wider than the clause they originate in are consistent with the proposed analysis. In the case of (57b), for example, we may assume the contextually most salient proposition to be *I was born in order to meet x*.

One may wonder how we can account for the observations in Section 4.3.1.1 that (31b), (34b), and (37b) can be truthfully uttered in the situations, (32b), (35b), and (38b), but not in the situations, (32a), (35a), and (38a), respectively, with which I have argued that NP-internal FPs do not have scope properties.

Under the proposed analysis, (31b), which is repeated here as (70a), for example, is interpreted as (70b).

(70) a. John-wa Kimura sensei-dake-ni email-de soodansita.

'(Lit.) John consulted with only Prof. Kimura through email.'

b. ⟦John-wa Kimura sensei-dake-ni email-de soodansita⟧ = the set of worlds in

which John consulted through email with Prof. Kimura, who is the unique

individual that satisfies the contextually most salient proposition under

consideration.

In order to account for the fact that (70a) can be true in (32b), but not in (32a) (both are

repeated here), we must assume that the contextually most salient proposition under con-

sideration must not be (71a); it should be (71b).

(32) There are two and only two professors, Profs. Kimura and Yamada.

a. Situation 1

John consulted with Prof. Kimura through email and with Prof. Yamada

through phone.

b. Situation 2

John consulted with Prof. Kimura through email, but with no other person.

(71) a. John consulted with x through email.

b. John consulted with x.

I assume that the pragmatic principle in (72) rules out (71a), but not (71b).

(72) Pragmatic Principle (Cf. Kuno's 1978 discourse principles.)

Do not repeat old information in the matrix clause, except a verb and a WA-

marked NP.

Given the assumption that the contextually most salient proposition under consideration

consists of old information, (72) disallows *email-de* 'through email' in (i) to be part of the

contextually most salient proposition; hence, (71a) is ruled out. Excluding (71a), (71b) is likely to be the proposition under consideration; hence, (70a) cannot be true in the situation, (32a).

4.3.1.3 Experimental Design

Having theoretically characterized NP-external FPs and NP-internal FPs, we are in a position to spell out an experimental design. Once again, to demonstrate that the iso-morphism principle holds between a QP and an NP plus an FP, what is necessary is an environment where both of the elements undergo covert movement and their c-command relation after the movement can be examined, provided that the c-command relation prior to the movement can be identified on an independent ground.

First of all, NP-internal FPs cannot be utilized for the demonstration since nothing ensures that an NP plus an NP-internal FP can undergo covert movement. Even if it turns out that my analysis is wrong and it does undergo covert movement, we have no way to examine its position after the movement with respect to a given QP, since it does not have scope properties.

NP-external FPs, on the other hand, seem to be useful. As argued above, the scope properties of NP-external FPs are best accounted for by the QR analysis, which assumes an NP plus an NP-external FP obligatorily undergoes covert movement for interpretation purposes, i.e., to avoid the type-mismatch problem.[21] Now suppose that a

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[21] We can independently motivate the assumption that an NP plus an NP-external FP obligatorily undergoes covert movement while an NP plus an NP-internal FP need not, using one of the conclusions in Chapter 3. In Chapter 3, we have concluded that the wide scope reading of the QP_{Obj} over the QP_{Sub} in [… QP_{Sub} [… QP_{Obj} …]] must be due to MINOR, and one of the necessary conditions for MINOR is that all of the clause-mates of the QP_{Obj} must be in an A-position (the conclusion drawn

QP exists as a clause-mate of an NP plus an NP-external FP. In this situation, the QP must undergo covet movement in order to bear clausal scope for the reason that you are familiar with by now. As scope-taking strategies, there are two options available for a QP in general: (i) LF compositional computation (i.e., through covet movement) and (ii) MINOR, an extra-grammatical operation. (Once again, I am assuming that the two ways are the only ways.) But for a QP to take clausal scope due to MINOR, all of the clause-mates of the QP must be in an A-position (the conclusion drawn from the discussions in Chapter 3:Sections 3.3 and 3.5.2).[22] Given that an NP plus an NP-external FP obligato-rily undergoes covert movement, the possibility of the QP taking clausal scope due to MINOR is excluded; hence, the QP must raise in order to bear clausal scope. Provided that when a QP exists as a clause-mate of an NP plus an NP-external FP, these elements need to undergo covert movement to bear clausal scope, we can examine their c-

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from the discussions in Chapter 3:Sections 3.3 and 3.5.2), see FN 6 for the definition of A-position. With the assumption under discussion, we thus predict that the generalizations in (i) emerge.

(i) a. The wide scope reading of the QP_{Obj} over the QP_{Sub} cannot obtain in [… QP_{Sub} [… QP_{Obj} …]], if an NP plus an NP-external FP exists as a clause-mate of the QP_{Obj}.

   b. The wide scope reading of the QP_{Obj} over the QP_{Sub} may obtain in [… QP_{Sub} [… QP_{Obj} …]], even if an NP plus an NP-internal FP exists as a clause-mate of the QP_{Obj}.

As illustrated in (ii), the prediction seems to be borne out; (ii-a) cannot give rise to the wide scope reading of the direct object QP over the subject QP while (ii-b) can.

(ii) a. Sanninizyoo-no sensei-ga   Toyota-ni-dake rei-no   hutari-no gakusei-o suisensita.
      three:more-GEN teacher-NOM Toyota-DAT-only that-GEN two-GEN student-ACC recommended
      (to siyoo)
      that suppose
      '(Suppose that) three or more professors recommended the two students only to Toyota.'

   b. Sanninizyoo-no sensei-ga Toyota-dake-ni rei-no hutari-gakusei-o suisensita (to siyoo).
      '(Lit.) (Suppose that) three or more professors recommended the two students to only Toy-ota.'

[22]   See FN 6 for the definition of A-position.

command relation after the movement through their scope interaction. In other words, we can safely assume that the following generalizations hold.

(73)   Let a QP be α, and an NP plus an NP-external FP β (where α and β are clause-mates).

    a. α can take wide scope with respect to β iff α c-commands β at LF.

    b. α can take narrow scope with respect to β iff α is c-commanded by β at LF.

4.3.2. Evidence for isomorphism principle

We are now in a position to demonstrate that the isomorphism principle holds between a QP and an NP plus an NP-external FP. Under the assumption that the isomorphism principle holds between them, we obtain (74), and from (73) and (74), the generalizations in (75) are derived.

(74)   Let a QP be α, and an NP plus an NP-external FP β.

    a. α can c-command β at LF iff α c-commands β prior to covert movement.

    b. α can be c-commanded by β at LF iff α is c-commanded by β prior to covert movement.

(75)   Generalizations with Isomorphism Principle

    Let a QP be α, and an NP plus an NP-external FP β (where α and β are clause-mates).

    a. α can take wide scope with respect to β iff α c-commands β, prior to covert movement.

    b. α can take narrow scope with respect to β iff α is c-commanded by β, prior to covert movement.

If the isomorphism principle does not hold between a QP and an NP-CM-FP, on the other hand, the generalizations in (76) should hold.

(76)   Generalizations without Isomorphism Principle

Let a QP be α, and an NP plus an NP-external FP β (where α and β are clause-mates).

a. α may take wide scope with respect to β even if α does not c-commands β, prior to covert movement.

b. α may take narrow scope with respect to β even if α is not c-commanded by β, prior to covert movement.

The following empirical materials indicate that (75) can be maintained, while (76) cannot.[23] First consider (77).

(77) a. Sanninizyoo-no sensei-ga   Toyota-ni-dake John-o   suisensita   (koto)
         three:more-GEN teacher-NOM Toyota-DAT-only John-ACC recommended that

'(That) three or more professors recommended John only to Toyota'

b. Takusan-no gakusei-ga   Kimura sensei-ni-dake   aisatusita (koto).
         many-GEN   student-NOM Kimura teacher-DAT-only greeted   that

'(That) many students greeted only Prof. Kimura'

Under the assumption that the NP$_1$ c-commands the NP$_2$ in [NP$_1$-*ga* NP$_2$-*o/ni* Verb] (cf. Kuroda 1969/70, Hoji 1985), we except from the generalizations in (75) that the examples in (77) give rise to the QP>FP reading but not the FP>QP reading. Under the generalizations in (76), on the other hand, we expect that they may give rise to either scope

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[23]   It should be noted that the generalizations in (75) cannot be accounted for by the Roothain analysis; hence, demonstrating the generalizations, we obtain yet another piece of evidence against the analysis.

orders. Our intuition confirms that they give rise to the QP>FP reading but not the FP>QP reading. (77a), for example, can be taken to mean (78a), but not (78b). We thus conclude that the generalizations in (75) must be adopted over those in (76); in particular, (75b) can be maintained while (76b) cannot.

(78)   a. The QP>FP reading

There are three or more xs, x is a professor such that there is no company other than Toyota to which x recommended John.

b. The FP>QP reading

There is no company other than Toyota such that there are three or more xs, x is a professor such that x recommended John to it.

We can truth-conditionally substantiate the intuition that (77a) can be taken to mean (78a), but not (78b), by considering the situations in (79).

(79)   There are six and only six professors, A, B, C, D, E, and F, and three and only three companies, Toyota, Nissan, and GM.

a.   Situation 1

A, B, and C all recommended John to Toyota, but not to Nissan or GM.

D, E, and F all recommended John to GM, but not to Toyota or Nissan.

b.   Situation 2

A recommended John to Toyota and Nissan, but not to GM.

B and C recommended John to Toyota, but not to Nissan or GM.

D recommended John to Nissan, but not to Toyota or GM.

E and F recommended John to GM, but not to Toyota or Nissan.

The situation in (79a) is a situation where there are three professors who recommended John only to Toyota, and it is not the case that Toyota is the only company to which three professors recommended John. In (79a), therefore, the reading in (78a) is true, but that in (78b) is false. The situation in (79b) is the opposite case, in which it is not the case that there are three professors who recommended John only to Toyota, but Toyota is the only company to which three professors recommended John. In (79b), therefore, the reading in (78a) is false, but that in (78b) is true. The fact confirms the generalizations under discussion, i.e., the sentence in (77a) is true in (79a) but false in (79b).[24]

A similar illustration can be given with *sae* 'even'. The examples in (80), for instance, give rise to the QP>FP reading but not the FP>QP reading.

(80) a. Sanninizyoo-no sensei-ga   Toyota-ni-sae   John-o   suisensita   (koto)
         three:more-GEN teacher-NOM Toytoa-DAT-even John-ACC recommended that

         '(That) three or more professors recommended John even to Toyota'

---

[24] If we replace the NP-external FPs of the examples in (77) with the NP-internal FPs, a different picture emerges. As illustrated in (i), they appear to give rise to both the QP>FP reading and the FP>QP reading; (i-a), for example, appears to allow both of the readings in (78).

(i)   a. Sanninizyoo-no sensei-ga   Toyota-dake-ni John-o   suisensita   (koto)
         three:more-GEN teacher-NOM Toyota-only-DAT John-ACC recommended that
         '(Lit.) (That) three or more professors recommended John to only Toyota'

      b. Takusan-no gakusei-ga   Kimura sensei-dake-ni   aisatusita (koto).
         many-GEN   student-NOM Kimura teacher-only-DAT greeted   that
         '(That) many students greeted only Prof. Kimura'

This observation seems compatible with the proposed analysis for NP-internal FPs above. Under the analysis, *Toyota-dake-ni* 'to only Toyota' in (i-a), for example, is taken to mean *Toyota, who is the only individual that satisfies the contextually most salient proposition under consideration*. When the contextually most salient proposition in this situation is understood to be: *there are three or more xs, x is a professor, such that x recommended John to y*, a reading analogous to the FP>QP reading emerges. When the contextually most salient proposition in this situation is: *the same set of three or more professors recommended John to y*, a reading analogous to the QP>FP reading is derived.

b. 15%izyoo-no toosika-ga   Toyota-ni-sae   toosisita (to syoo).
   15%:more-GEN investor-NOM Toyota-DAT-even invested that suppose

'(Suppose that) 15% or more of the investors invested even in Toyota.'

We can, for example, substantiate the intuition that (80a) can be understood to mean (81a), but not (81b), by considering the situations in (82).

(81)   a. The QP>FP reading

        There are three or more *x*s, *x* is a professor such that each company in a given

        context α has the property that *x* recommended John to it and Toyota is the

        least likely company to have that property in α.

       b. The FP>QP reading

        Each company in a given context α has the property that there are three or

        more *x*s, *x* is a professor such that *x* recommended John to it and Toyota is the

        least likely company to have that property in α.

(82)   Toyota, Nissan, and Honda are under discussion. The professors relevant to

         the context are only A, B, C, D, E, F, and G.

       a. Situation 1

        A, B, and C, but not D, E, F, or G, recommended John to Toyota.

        A, B, and C, but not D, E, F, or G, recommended John to Nissan.

        A, B, and C, but not D, E, F, or G, recommended John to Honda.

        For A, B, and C, Toyota is the least likely company to recommend John to.

        But Nissan is the least likely company to have the property that three or more

        professors recommend John to it.

b. Situation 2

A, B, and C, but not D, E, F, and G, recommended John to Toyota.

B, C, and D, but not A, E, F, and G, recommended John to Nissan.

A, B, and D, but not C, E, F, and G, recommended John to Honda.

Toyota is the least likely company to have the property that three or more

professors recommend John to it.

In (82a), the reading in (81a) is true, but that in (81b) is false; however, in (82b), the

reading in (81a) is false, but that in (81b) is true. The fact seems to be that (80a) can be

truthfully uttered in (82a), but not in (82b), supporting the conclusion that the generaliza-

tions in (75) must be adopted over those in (76), in particular, (75b) can be maintained

while (76b) cannot.[25, 26]

We receive further support for the generalization in (75b) by comparing the exam-

ples in (77) with their 'scrambling' counterparts in (83).

(83) a. Toyota-ni-dake sanninizyoo-no sensei-ga   John-o   suisensita   (koto)
       Toyota-DAT-only three:more-GEN teacher-NOM John-ACC recommended that

       '(Lit.) (That) only to Toyota, three or more professors recommended John'

    b. Kimura sensei-ni-dake   takusan-no gakusei-ga aisatusita (koto).
       Kimura teacher-DAT-only many-GEN student-NOM greeted   that

       '(Lit.) (That) only Prof. Kimura, many students greeted'

---

[25] A remark similar to the one in FN 24 applies here.

[26] English facts seem to support the generalizations under discussion as well. The examples in (i),
for instance, give rise to the QP>FP reading, but not the FP>QP reading.

(i) a. Three professors recommended John only to Toyota.

     b. 10% of the professors introduce John even to Mary.

The examples in (83), unlike those in (77), give rise to the FP>QP reading, in addition to the QP>FP reading. (83a), for example, seems to give rise to both of the readings in (78), and this intuition is truth-conditionally substantiated because it can be truthfully uttered in both of the situations in (79). Given the assumption that the NP$_2$ can c-command, or be c-commanded by, the NP$_1$ in the configuration of [NP$_2$-*ni/o* NP$_1$-*ga* Verb], prior to covert movement (cf. Hoji 1985, Ueyama 1998, 2002), the contrast between (77) and (83) with regard to the availability of the FP>QP reading is consistent with the generalization in (75b), but not with that in (76b).

Let us now turn to a demonstration that the generalization in (75a) can be maintained while that in (76a) cannot, and for this purpose, consider (84).

(84) a. Kimura sensei-wa Toyota-ni-dake   sanninizyoo-no gakusei-o   suisensita.
        Kimura teacher-TOP Toyota-DAT-only three:more-GEN student-ACC recommended

        '(Lit.) Prof. Kimura recommended only to Toyota three or more students.'

      b. Kimura sensei-wa   John-ni-dake 10%izyoo-no hon-o   susumeta.
        Kimura teacher-TOP John-DAT-only 10%:more-GEN book-ACC recommended

        '(Lit.) Prof. Kimura recommended only to John 10% or more of the books.'

Under the assumption that the NP$_2$ c-commands the NP$_3$ in the configuration of [NP$_1$-*ga* NP$_2$-*ni* NP$_3$-*o* Verb], prior to covert movement (cf. Hoji 1985 and Hayashishita 2000b), the generalizations in (75) lead us to expect that the examples in (84) give rise to the FP>QP reading but not the QP>FP reading. Under the generalizations in (76), on the other hand, we expect that they may give rise to both of the readings. According to our intuition, the facts are what the generalizations in (75) lead us to expect; (84a), for example, can be taken to mean (85b), but not (85a). Hence, I conclude that (75a) can be maintained while (76a) cannot.

(85)   a. The QP>FP reading

There are three or more *x*s, *x* is student such that there is no company other than Toyota to which Prof. Kimura recommended *x*.

b. The FP>QP reading

There is no company other than Toyota such that there are three or more *x*s, *x* is a student such that Prof. Kimura recommended *x* to it.

The following situations, for example, allow us to truth-conditionally substantiate the intuition that (84a) gives rise to (85b), but not (85a).

(86)   There are six and only six students, A, B, C, D, E, and F, and three and only three companies, Toyota, Nissan and GM.

a. Situation 1

Prof. Kimura recommended A, B, and C to Toyota but not to Nissan or GM.

Prof. Kimura recommended D, E, and F to GM, but not to Toyota or Nissan.

b. Situation 2

Prof. Kimura recommended A to Toyota and Nissan, but not to GM.

Prof. Kimura recommended B and C to Toyota, but not to Nissan or GM.

Prof. Kimura recommended D to Nissan, but not to Toyota or GM.

Prof. Kimura recommended E and F to GM, but not to Toyota or Nissan.

(86a) is a situation where there are three students who Prof. Kimura recommended only to Toyota, and it is not the case that Toyota is the only company to which Prof. Kimura recommended three students. In (86a), therefore, (85a) is true, but (85b) is false. The situation in (86b) is the opposite case. It is a situation where it is not the case that there are three students who Prof. Kimura recommended only to Toyota, but Toyota is the

only company to which Prof. Kimura recommended three students. In (86b), there-

fore, (85b) is true, but (85a) is false. The fact seems to be that (84a) can be truthfully

uttered in (86b) but not in (86a), confirming the generalizations in (75).[27]

Let us go through a similar illustration with *sae* 'even'. The examples in (87), for

instance, give rise to the FP>QP reading but not the QP>FP reading.

(87) a. Kimura sensei-wa Toyota-ni-sae   sanninizyoo-no gakusei-o   suisensita.
          Kimura teacher-TOP Toyota-DAT-even three:more-GEN student-ACC recommended

          '(Lit.) Prof. Kimura recommended even to Toyota three or more students.'

      b. Kimura sensei-wa John-ni-sae   10%izyoo-no   zidoosya gaisya-o
          Kimura teacher-TOP John-DAT-even 10%:more-GEN car   company-ACC

          syookaisita.
          introduced

          '(Lit.) Prof. Kimura introduced even to John 10% or more of the automobile
          companies.'

The fact that (87a) can be taken to mean (88b), but not (88a), for example, can be

truth-conditionally substantiated by considering the situations in (89).

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[27]   The examples in (i) contrast with those in (84), and they give rise to both the QP>FP reading and
the FP>QP reading. This observation seems compatible with the proposed analysis for NP-internal
FPs above for the reason mentioned in FN 24.

(i)   a. Kimura sensei-wa   Toyota-dake-ni   sanninizyoo-no gakusei-o   suisensita.
           Kimura teacher-TOP Toyota-only-DAT three:more-GEN student-ACC recommended
           '(Lit.) Prof. Kimura recommended to only Toyota three or more students.'

       b. Kimura sensei-wa   John-dake-ni   10%izyoo-no   hon-o   susumeta.
           Kimura teacher-TOP John-only-DAT 10%:more-GEN book-ACC recommended
           '(Lit.) Prof. Kimura recommended to only John 10% or more of the books.'

(88)　a.　The QP>FP reading

There are three or more *x*s, *x* is a student such that each company in a given context α has the property that Prof. Kimura recommended x to it, and Toyota is the least likely company to have that property in α.

b.　The FP>QP reading

Each company in a given context α has the property that there are three or more *x*s, *x* is a student such that Prof. Kimura recommended *x* to it, and Toyota is the least likely company to have that property in α.

(89)　　Toyota, Nissan, and Honda are under discussion. The students relevant to the context are only A, B, C, D, E, F, and G.

a.　Situation 1

Prof. Kimura recommended A, B, and C, but not D, E, F, and G, to Toyota.

Prof. Kimura recommended A, B, and C, but not D, E, F, and G, to Nissan.

Prof. Kimura recommended A, B, and C, but not D, E, F, and G, to Honda.

For A, B, and C, Toyota is the least likely company for Prof Kimura to recommend them to.

But Nissan is the least likely company to have the property that Prof. Kimura recommends three or more students to it.

b.　Situation 2

Prof. Kimura recommended A, B, and C, but not D, E, F, and G, to Toyota.

Prof. Kimura recommended B, C, and D, but not A, E, F, and G, to Nissan.

Prof. Kimura recommended A, B, and D, but not C, E, F, and G, to Honda.

Toyota is the least likely company to have the property that Prof. Kimura

recommends three or more students to it.

In (89a), the reading in (88a) is true, but that in (88b) is false; however, in (89b), the

reading in (88a) is false, but that in (88b) is true. The fact seems to be that (87a) can be

truthfully uttered in (89b), but not in (89a), supporting the conclusion that the generaliza-

tions in (75) must be adopted over those in (76), in particular, (75a) can be maintained

while (76b) cannot.[28]

Once again, we can further confirm the generalization in (75a) by considering

'scrambling' examples. For instance, the examples in (90) contrast with those in (84) in

that the former, but not the latter, gives rise to the QP>FP reading, in addition to the

FP>QP reading.

(90)   a. Kimura sensei-wa   sanninizyoo-no gakusei-o   Toyota-ni-dake   suisensita
           Kimura teacher-TOP three:more-GEN student-ACC Toyota-DAT-only recommended

       'Prof. Kimura recommended three or more students only to Toyota.'

       b. Kimura sensei-wa   10%izyoo-no hon-o   John-ni-dake   susumeta.
           Kimura teacher-TOP 10%:more-GEN book-ACC John-DAT-only recommended

       'Prof. Kimura recommended 10% or more of the books only to John.'

Under the assumption that the NP_3 can c-command, or be c-commanded by, the NP_2 in

the configuration of [NP_1-*ga* NP_3-*o* NP_2-*ni* Verb], prior to covert movement (cf. Hoji

1985 and Kitagawa 1994), the contrast can be accounted for by the generalization in

(75a), but not by that in (76a).[29]

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[28]   A remark similar to the one in FN 27 applies here.

[29]   A remark similar to the one in FN 10 applies here.

In summary, we have observed that the generalizations in (75), repeated here, hold.

(75)   Generalizations with Isomorphism Principle

Let a QP be α, and an NP plus an NP-external FP β (where α and β are clause-mates).

a. α can take wide scope with respect to β iff α c-commands β, prior to covert movement.

b. α can take narrow scope with respect to β iff α is c-commanded by β, prior to covert movement.

Given that (75) can be straightforwardly accounted for under the assumption that the isomorphism principle holds between a QP and an NP plus an NP-external FP, together with the inherent properties of both of the elements, (75) demonstrates the effects of the isomorphism principle.[30]

4.4. Summary and additional remarks

In summary, I have argued above that the isomorphism principle in (3) holds (i) between a QP and a referential expression, and (ii) between a QP and an NP plus an FP. (3) is repeated here for convenience.

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[30]   As in the case of the previous demonstration in Section 4.2, one may wonder if the generalizations in (75) can be replaced with those in (i). Such is however not the case, given the facts mentioned above that the examples in (83) give rise to the QP>FP reading, and those in (90) allow the FP>QP reading.

(i)   Generalizations with Linear Principle
       Let a QP be α, and an NP plus an NP-external FP β (where α and β are clause-mates).
    a. α can take wide scope with respect to β iff α precedes β, prior to covert movement.
    b. α can take narrow scope with respect to β iff α is preceded by β, prior to covert movement.

(3)   Isomorphism Principle

When two noun phrases, α and β, undergo covert movement, their c-command

relation prior to the movement cannot be altered.

This chapter thus confirms the generalization in Chapter 3 that in the configuration of

[… QP$_{Sub}$ [… QP$_{Obj}$ …]], the wide scope reading of the QP$_{Sub}$ over the QP$_{Obj}$ may obtain

based on the LF in (2a) while that of QP$_{Obj}$ over the QP$_{Sub}$ is not based on the LF in (2b),

supporting the thesis that the former may emerge through LF compositional computation

while the latter does not. (2) is also repeated here for convenience.

(2)   (Ψ stands for an element that denotes a one-place predicate.)

a. LF: [$_Ψ$ QP$_{Sub}$ [$_Ψ$ QP$_{Obj}$ [$_Ψ$ … t$_{Sub}$ [… t$_{Obj}$ …]]]]

b. LF: [$_Ψ$ QP$_{Obj}$ [$_Ψ$ QP$_{Sub}$ [$_Ψ$ … t$_{Sub}$ [… t$_{Obj}$ …]]]]

Before leaving this chapter, I would like to make a remark on the nature of the iso-

morphism principle itself. Although I have argued for the isomorphism principle above,

this principle is difficult to state in terms of theoretical primitives. In the general

framework of the minimalist program (cf. Chomsky 1995), for example, covert move-

ment is stated in terms of Copy and Merge. Thus, the incorporation into the grammar of

this principle as it is stated requires us to put constraints on these primitive operations. It

would therefore be desirable to derive its effects of this principle independently.

In Chapter 3, I have argued that the *shortest move* principle in (91) is an absolute

principle, contra Fox (2000), who claims that a QP, after moving to the closest position

in which it is interpretable, can continue to raise as long as the *scope economy* principle

is not violated.

(91)   (= Fox 2000:Ch.2 (6), p.23)

Shortest Move

QR must move a QP to the closest position in which it is interpretable. In other words, a QP must always move to the closest clause-denoting element that dominates it.

Given (91) as an absolute principle, together with the isomorphism principle, it is always the case that the landing site of a given QP after covert movement is identified from its pre-movement position. It would therefore be possible to remove covert movement from the generative procedure of the grammar altogether, and the problem alluded to above would cease to be a problem. Acknowledging a number of arguments for covert movement (cf. Mar 1985:Ch.1), however, I leave open the issue of whether or not covert movement can be dispensed with, and continue to assume covert movement with the two principles in the following chapters.

Chapter 5

Functional and Pair-List Readings

5.1. Introduction

In Chapter 3, I have maintained that there are two sources of scope interaction among QPs: (i) LF compositional computation and (ii) MINOR, an extra-grammatical operation. Given the reasonable assumption that a *wh*-word is analyzed as an existential quantifier (cf. Kuroda 1965, Hamblin 1971, Karttunen 1977), we expect that the LF/MINOR dichotomy emerges in the scope interaction between a QP and a *wh*-word. The aim of this chapter is to demonstrate that such is indeed the case, providing further support for the very thesis.

In the rest of the chapter, I will investigate the scope interaction between a QP and a *wh*-word in the configuration of (1), exemplified by (2a), making reference to functional answers as in (2b) and pair-list answers as in (2c).

(1)   [… QP [… WH …]] prior to A'-movement[1]

(2)   a. Please tell me what everyone brought today.

    b. A dish that she or he likes.

    c. Boaz pomegranates, Ruth olives, and Naomi maize.

The main thesis of this chapter is that for a *wh*-question whose configuration is (1), the scope interaction between the QP and the *wh*-word can be based on through LF compositional computation when it is responded by functional answers, but not so when it is

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[1]   A'-movement includes both overt and covert A'-movement.

replied by pair-list answers. The scope interaction in the latter case must be due to MINOR. It thus turns out that the mental representation associated with pair-list answers may radically differ from that associated with functional answers.

The following sections are organized as follows. Section 5.2 establishes the main thesis of the chapter, by demonstrating that for a *wh*-question whose configuration is (1), pair-list answers are possible only if all of the necessary conditions for a QP to take clausal scope due to MINOR are met, while functional answers can be used even if it is not the case that all of the conditions are met. Section 5.3 argues three generalizations that directly follow from the very thesis. Section 5.4 considers the current debate regarding the status of pair-list readings in the light of the discussion in the previous sections. I conclude in Section 5.5 with a brief summary and a few additional remarks.

In the following discussion, for expository purposes, when a *wh*-question is responded by a functional answer, it is said that the question has a functional reading. Similarly, when a *wh*-question is replied by a pair-list answer, it is said that the question has a pair-list reading. The empirical materials to be presented are from English and Japanese.

5.2. Functional readings may emerge through LF compositional computation while pair-list readings must be due to MINOR.

In Chapter 3, I have maintained the following generalizations, where WSR$<\alpha, \beta>$ signifies the wide scope reading of α over β.

(3)　　　(= Chapter 3 (36))

  a. WSR<α, β> can obtain due to MINOR, where α and β are QPs, only if all of the conditions, (i)-(iii), are met.

  b. WSR<α, β> can obtain through LF compositional computation, where α and β are QPs, even if it is not the case that all of the conditions, (i)-(iii), are met.

  i. The speaker refers to a specific group with α.

  ii. If there is a QP γ that is not α or β, or a potential dependent term δ, then β does not take wide scope with respect to γ or bind δ.

  iii. If the verb of which α is an argument is negated, the scope of the verbal negation is limited to the verb itself.

As the evidence that functional readings may emerge through LF compositional computation while pair-list readings must be due to MINOR, I will demonstrate that pair-list readings are possible only if all of the necessary conditions for a QP to bear clausal scope due to MINOR are met, but the availability of functional readings is not subject to such conditions. In particular, I will argue that the generalizations in (4) hold.

(4) a. A *wh*-question whose configuration is [… QP [… WH …]] prior to A'-movement can be answered with pair-list answers only if all of the conditions, (i)-(iii), are met.

  b. A *wh*-question whose configuration is [… QP [… WH …]] prior to A'-movement can be answered with functional answers even if it is not the case that all of the conditions, (i)-(iii), are met.

  i. The speaker refers to a specific group with the QP.

ii. If there is a potential dependent term δ, then the *wh*-word does not bind δ.[2]

iii. If the verb of which the QP is an argument is negated, the scope of the verbal

negation is limited to the verb itself.

In the following three subsections, Sections 5.2.1, 5.2.2, and 5.2.3, the contrast be-

tween pair-list and functional readings will be addressed with regard to the conditions

(i), (ii) and (iii), respectively.

5.2.1. Presence or absence of specificity effects

While it is uncontroversial that *wh*-questions whose configuration is [… QP […

WH …]] prior to A'-movement may or may not be answered by pair-list answers, the

issue of precisely which QPs support, or do not support, pair-list readings is difficult to

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[2]   To make (4) completely parallel to (3), the condition (4-ii) should be stated as follows.

(i)   If there is a QP γ that is not the QP or the *wh*-word, or a potential dependent term δ, then the
          wh-word does not take wide scope with respect to γ or bind δ.

Although I think that (i) should hold, it is not easy to demonstrate that a *wh*-word can take scope with
respect to a QP for the following reason.
      As mentioned in FN 1 in Chapter 2, readings like (i-b) for (i-a) and (ii-b) for (ii-a) are often
treated as instances of wide scope readings in the literature; however, it is not clear that they are such
instances,

(i)   a.   Three boys love some girl.
       b.   There is some *y*, *y* is a girl, such that there are three *x*s, *x* is a boy such that *x* loves *y*.

(ii)   a.   Some girl loves three boys.
       b.   There is some *x*, *x* is a girl, such that there are three *y*s, *y* is a boy such that *x* loves *y*.

As Kuroda (1994) correctly points out, (i-b), for example, is truth-conditionally equivalent with the
branching reading in (iii-a), where neither element takes wide scope with respect to the other, and
similarly, (ii-b) cannot be truth-conditionally differentiated from (iii-b).

(iii) a.   There is some *y*, *y* is a girl and there are three *x*s, *x* is a boy such that *x* loves *y*.
       b.   There is some *x*, *x* is a girl and there are three *y*s, *y* is a boy such that *x* loves *y*.

      To the extent that branching readings must be recognized independently from wide scope read-
ings in a theory of the grammar, therefore, we cannot take readings like (i-b) and (ii-b) as evidence for
the object QP or the subject QP takes scope above the other. And given that a *wh*-word is analyzed as
a singular existential quantifier (cf. Kuroda 1965, Hamblin 1971, Karttunen 1977), we must face a
similar difficulty in determining whether or not a *wh*-word can takes scope over a QP.

settle. Groenendijk and Stokhof (1984), for example, maintain the generalization that only universal quanitifiers support pair-list readings. But this is challenged by researchers such as Chierchia (1993) and Lahiri (2002), among others, who claim that in principle, all quantifiers except monotone decreasing quantifiers support pair-list readings. For example, Lahiri (2002) states on p.21 as follows.

> *[The] claim that only universal quantifiers can be quantified into questions is clearly false, since it is definitely possible to quantify in two, at least two, most(?), many(?). While judgments on these are rather slippery […], the only quantifiers that strongly disallow quantifying into questions are monotone decreasing quantifiers like no, few, at most n, etc.*

In support of his factual assessment, Lahiri refers to the contrast between (5a) and (5b): (5a) can be replied with pair-list answers while (5b) cannot.

(5)   (= Lahiri 2002 (60), p.21)

   a. (Tell me) what at least a few people did.

   b. (Tell me) what few people did.

Szabolcsi (1997a), on the other hand, argues that the distribution of pair-list readings in matrix clauses is different from that in embedded clauses. Regarding the matrix *wh*-questions, she claims based on the contrast between (6) and (7) that universal quantifiers support pair-list readings but modified numerals do not.

(6)   (= Szabolcsi 1997a (23), p.320, slightly adapted)

   a. Who/which boys did every dog bite?   ^OK Fido bit X, Spot bit Y, …

   b. Which boy/what boy did every dog bite?   ^% Fido bit X, Spot bit Y, …

(7)   (= Szabolcsi 1997a (24), p.320, slightly adapted)

    a. Who/which boys did more than two dogs bite?

                                    * Fido bit X, Spot bit Y, …

    b. Which boy/what boy did more than two dogs bite?

                                      * Fido bit X, Spot bit Y, …

She, however, maintains that the contrast disappears when the questions in (6)-(7) are embedded as the compliment of *to find out* as in (8)-(9).

(8)   (= Szabolcsi 1997a (25), p.320, slightly adapted)

    a.   John found out who/which boys every dog bit.

    b.   John found out which boy every dog bit.

(9)   (Based on Szabolcsi 1997a (26), p.320)

    a. John found out who/which boys more than two dogs bit.

    b. John found out which boy more than two dogs bit.

According to her, the sentences in (8) can be taken to mean that John found out about each dog regarding which boy he bit, and similarly, those in (9) can be understood to mean that John found out about more than two dogs regarding which boy each of the dogs bit. She attributes the contrast between (7) and (9) to some semantic property that distinguishes embedded clauses from matrix clauses, see Szabolcsi 1997a:Section 2.2, pp.321-4.

It seems, however, that neither the Chierchia/Lahiri generalization nor the Szabolcsi generalization can be maintained. First, the Chierchia/Lahiri generalization must be rejected because examples like (7) do not give rise to pair-list readings. Second, the matrix/embedded dichotomy Szabolcsi puts forth lacks empirical justification; for the embedded questions in (10) are very difficult to associate with pair-list answers.

Hence, we are yet to see a generalization that captures the distribution of pair-list readings.

(10)   (Context: Someone asks you, "At the end of each year, what does John need to do as a part of his job?" You reply with the following sentences).

    a. He needs to find out who/which boys more than two dogs will have bitten.

    b. He needs to find out which boy more than two dogs will have bitten.

I maintain that the notion necessary to capture the distribution of pair-list readings is specificity, a pragmatic notion. In particular, I claim that the generalization in (11) holds.[3]

(11)   A *wh*-question whose configuration is [… QP [… WH …]] prior to A'-movement can be answered with pair-list answers only if the speaker refers to a specific group with the QP.

Notice that (11) captures the contrast between (9) and (10) with regard to the (un)availability of pair-list readings. To utter the sentences in (9), the speaker must know which dogs she or he is talking about. But the question in the context of (10) has to do with John's annual task, and since (10a) and (10b) are uttered in response to that, it is unlikely that the speaker refers to a specific group with *more than two dogs*. I wish to maintain that the contrast between (7) and (9) also follows from (11). Given (11), the intuition shared by Chierichia and Lahiri is not surprising since monotone decreasing

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[3]   Williams (1986:296-8) reports a similar intuition. He claims that pair-list readings emerge only if the relevant QP is construed as a group, partly based on the fact that examples like *who did they dance with?* give rise to pair-list readings.

quantifiers are unlikely to be used to refer to a specific group in the sense of the present discussion.

The generalization in (11) is also supported in Japanese. When (12a) and (12b) are uttered, for example, we can reasonably assume that the speakers refer to specific groups with *subete-no gakusei* 'every student' and *rei-no sannin-no sotugyoosei* 'the three graduates'.

(12) a. Subete-no gakusei-ga   dare-o   tazuneteitta ka osiete kudasai.
          all-GEN   student-NOM who-ACC visited   Q   teach please

       'Please tell me who every student visited.'

      b. Rei-no sannin-no sotugyoosei-ga doko-ni   syuusyokusita ka osiete kudasai.
         the-GEN three-GEN graduates-NOM where-DAT obtained:job   Q teach   please

       'Please tell me where the three graduates obtained a job.'

And upon hearing (12a) and (12b), we may respond, for example, with the pair-list answers, (13a) and (13b), respectively.

(13) a. Taroo-ga Mary-o, Jiroo-ga   Susan-o, Saburoo-ga   Jennifer-o,
          Taroo-NOM Mary-ACC Jiroo-NOM Susan-ACC Saburoo-NOM Jennifer-ACC

       Shiroo-ga   Kati-o   desu.
       Shiroo-NOM Kati-ACC COPULA

       'Taroo Mary, Jiroo Susan, Saburoo Jennifer, and Shiroo Kati.'

      b. Toroo-ga   Toyota-ni, Jiroo-ga   Nissan-ni desu.
         Taroo-NOM Toyota-DAT Jiroo-NOM Nissan-DAT COPULA

       'Taroo to Toyota, and Jiroo to Nissan.'

However, I find (almost) impossible to reply with pair-list answers to the questions in (14), where we can safely assume that the speaker does not refer to a specific group with the QP.

(14) a. Maitosi [15%izyoo-no sinnyuusei]-ga [dare]-o tazuneteiku ka
every:year 15%:more-GEN new:student-NOM who-ACC visit Q

osiete kudasai.
teach please

'Please tell me who 15% or more of the new students visit each year.

b. Maitosi [sanninizyoo-no sotugyoosei]-ga [doko]-ni syuusyokusuru ka
every:year three:more-GEN graduates-NOM where-DAT obtain:job Q

osiete kudasai.
teach please

'Please tell me where three or more graduates obtain a job each year.'

It should also be noted that the fact that the examples in (14) cannot give rise to a pair-list reading cannot be attributed to the nature of the QPs, since pair-list readings are possible for the examples in (15). (15a), for instance, can be taken to mean that John found out about 15% or more of the students regarding who each of them visited.

(15) a. John-wa [15%izyoo-no sinnyuusei]-ga [dare]-o tazuneta ka tukitometa.
John-TOP 15%:more-GEN new:student-NOM who-ACC visited Q found:out

'John found out who 15% or more of the new students visited.'

b. John-wa [sanninizyoo-no sotugyoosei]-ga [doko]-ni syuusyokusita ka
John-TOP three:more-GEN graduates-NOM where-DAT obtained:job Q

tukitometa.
found:out

'John found out where three or more graduates obtained a job.'

The availability of functional readings is not limited in the way that of pair-list readings is. The generalization in (16) seems to hold.

(16) A *wh*-question whose configuration is [… QP [… WH …]] prior to A'-movement may be answered with functional answers whether or not the speaker refers to a specific group with the QP.

Chierchia (1993) points out, for example, that both universal QPs and monotone decreasing quantifiers (the latter of which are unlikely to be taken as referring to a specific group) support functional readings. Both of the questions in (17), for example, can be answered with *his mother-in-law*.

(17) (Based on Chierchia 1993 (32), p.195)

a. Who does every Italian married man like?

b. Who does no Italian married man like?

Functional readings obtain also when the QP under consideration is not monotone decreasing quantifiers and used non-specifically in the sense of the present discussion; e.g., (18) can be answered with *the picture of his favorite actress*.

(18) What does at least one student bring to the first class of Prof. Smith's each year?

The same story holds also in Japanese. The questions, (19a) and (19b), where we can reasonably assume that the speaker refers to a specific group with the QP, can be responded, for example, with the functional answers, (20a) and (20b), respectively.

(19) a. Subete-no kaisya-ga   dare-ni   kabu-o   uriwatasita ka osiete kudasai.
         all-GEN   company-NOM who-DAT stock-ACC sold   Q teach   please

   'Please tell me to whom every company sold stocks.'

   b. Rei-no hutatu-no kaisya-ga   doko-o   uttaeta ka osiete kudasai.
         the-GEN two-GEN   company-NOM where-ACC sued   Q teach   please

   'Please tell me who the two companies sued.'

(20) a. Soko-o   tuneni ooensiteiru   ginkoo(-ni) desu.
         that:place-ACC always is:supporting bank-DAT   COPULA

   'It is (to) the bank that always supports it.'

b. Soko-no   kanrengaisya(-o) desu.
   that:place-GEN affiliate-ACC   COPULA

'It is its affiliate.'

Similarly, the questions, (21a) and (21b), where we can safely assume that the speaker does not refer to a specific group with the QP, can be replied by the functional answers, (20a) and (20b).

(21) a. Maitosi takusan-no kaisya-ga   dare-ni   kabu-o   uriwatasu ka
            every:year many-GEN company-NOM who-DAT stock-ACC sell   Q

            osiete kudasai.
            teach   please

            'Please tell me to whom many companies sell stocks each year.'

  b. Maitosi   10%izyoo-no kaisya-ga   doko-o   uttaeru ka osiete kudasai.
            every:year 10%:more-GEN company-NOM where-ACC sue   Q   teach please

            'Please tell me who 10% or more of the companies sue each year.'

The generalizations that have emerged are repeated in (22).

(22)   Let ρ be a *wh*-question whose configuration is [… QP [… WH …]] prior to A'-movement

    a. ρ can be answered with pair-list answers only if the speaker refers to a specific group with the QP.

    b. ρ can be answered with functional answers whether or not the speaker refers to a specific group with the QP.

5.2.2. Presence or absence of freezing effects

We have confirmed above that pair-list readings require one of the conditions for MINOR, the specificity condition, to be met, while functional readings do not. This sub-section demonstrates that pair-list readings also contrast with functional readings with

with respect to another condition for MINOR. In particular, I argue that the generalizations in (23) hold.

(23)   Let ρ be a *wh*-question whose configuration is [… QP [… WH …]] prior to

        A'-movement.

    a. When ρ is answered with pair-list answers, the *wh*-word cannot bind a

       dependent term.

    b. When ρ is answered with functional answers, the *wh*-word can still bind a

       dependent term.

To illustrate the generalizations in (23), some preparatory remarks are in order. Ueyama (1998) claims that among phenomena so-called binding, some do not involve binding, based on the observation that some QPs/*wh*-words may 'bind' either an element that has a large semantic content (such as a demonstrative plus an NP) or an element whose semantic content is minimal (such as a pronoun), while others can only 'bind' the latter, as illustrated in (24)-(27).[4, 5]

(24)   a.   (= Evans 1977, p.491)

       <u>Every logician</u> was walking with a boy near <u>that logician</u>'s house.

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[4]   (Intended) 'binding' is marked with underlines.

[5]   Regarding the distinction between elements whose semantic content is large and those whose semantic content is small, Ueyama (1998) states on p.126 as follows:

Following Hoji [1995], I assume that the distinction between [large]NPs and [small]NPs is basically determined based on the 'amount of semantic content' on N. Since the 'amount of semantic content' is a matter of degree, it follows that it is a partition relative to each other, rather than an absolute distinction. Since the 'amount of semantic content' is subjective in nature, it is well expected that the ways of classification vary depending on speakers and contexts. Therefore, these notions – [large]NPs and [small]NPs – should be regarded as purely for the sake of description, rather than as theoretical terms.

b. <u>Every logician</u> was walking with a boy near <u>his</u> house.

c. (= Ueyama 1998 (71a), p.157, slightly adapted)

<u>Which logician</u> was walking with a boy near <u>that logician</u>'s house?

d. <u>Which logician</u> was walking with a boy near <u>his</u> house?

(25) a. (= Ueyama 1998 (72a), p.157, slightly adapted)

*<u>Even this logician</u> was walking with a boy near <u>that logician</u>'s house.

b. <u>Even this logician</u> was walking with a boy near <u>his</u> house.

(26) (= Ueyama 1998 (15) and (17), pp.128-129, slightly adapted)

a. <u>Dono zidoosya gaisya</u>-ga <u>soko</u>-no kogaisya-o suisensita
which automobile company-NOM that:place-GEN subsidiary-ACC recommended

no ?
COMP

'<u>Which automobile company</u> recommended <u>its</u> subsidiary?'

b. <u>Dono zidoosya gaisya</u>-ga <u>sono zidoosya gaisya</u>-no kogaisya-o
which automobile company-NOM that automobile company-GEN subsidiary-ACC

suisensita no ?
recommended COMP

'<u>Which automobile company</u> recommended <u>that automobile company</u>'s subsidiary?'

(27) (= Ueyama 1998 (14) and (16), pp.128-9, slightly adapted)

a. <u>Toyota-sae</u>-ga <u>soko</u>-no kogaisya-o suisensita.
Toyota-even-NOM that:place-GEN subsidiary-ACC recommended

'<u>Even Toyota</u> recommended <u>its</u> subsidiary.'

b. *?<u>Toyota-sae</u>-ga <u>sono zidoosya gaisya</u>-no kogaisya-o suisensita.
Toyota-even-NOM that automobile company-GEN subsidiary-ACC recommended

'<u>Even Toyota</u> recommended <u>that automobile company</u>'s subsidiary.'

Under the assumption that the general principle of recoverability of deletion in the sense of Chomsky 1986:70 disallows an element whose semantic content is large to be a variable, Ueyama concludes that the anaphoric relation between a QP/*wh*-word and an element whose semantic content is large is not an instance of binding, and attributes the anaphoric relation under discussion to a mechanism analogous to *E-type link* in the sense of Evans 1977. In other words, Ueyama maintains that the 'binding' of some QPs/*wh*-words may be based on either true binding or E-type link.[6]

Ueyama furthermore claims, based on the acceptable statuses of the examples in (28)-(29), that E-type link-based 'binding' is not subject to the c-command condition in the sense of Reinhart 1983.

(28)   (Based on Ueyama 1998 (73) p.158)

    a. ?<u>Which student</u> did <u>his/that student's</u> professor recommend for a lucrative project?

    b. ?<u>Which one of these boys</u> did <u>his</u> wife divorce?

(29)   (Based on Ueyama 1998 (37)-(38), p.136-137)

    a. Kyonen Toyota-ga   <u>dono zidoosya gaisya</u>-o   uttaeta koto-ga
       last:year Toyota-NOM which automobile company-ACC sued   fact-NOM

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[6]   According to Ueyama (1998), the elements in (i-b) and (ii-b), but not those in (i-a) and (ii-a), allow E-type link-based 'binding'.

(i)   (= Ueyama 1998:Ch.3 (12), p.124, slightly adapted)
    a. NP-*sae* 'even NP', *kanarinokazu-no* NP 'most of the NPs',
      10 izyoo-no NP 'ten or more NPs'   *55%-no* NP '55% of the NPs'
      NP1 *to* NP2 (*to*) 'NP1 and NP2' NP1 *ka* NP2 (*ka*) 'either NP1 or NP2'
    b. *dono* NP 'which NP'   *dono* NP-*mo* 'every NP'
      (*subete-no* NP 'every NP')

(ii)   (= Ueyama 1998:Ch.3 (69), p.157, slightly adapted)
    a. even NP, (who)
    b. which NP, (every NP), (no NP)

soko / sono zidoodya gaisya-o toosan-ni oiyatta no ?
that:place that automobile company-ACC bankrupt-DAT drove COMP

'(Lit.) [The fact that Toyota sued <u>which automobile company</u> last year] caused <u>it / that automobile company</u> to go bankrupt?'

b. Kyonen <u>dono zidoosya gaisya</u>-ga Toyota-o uttaeta toyuu riyuu-de,
last:year which automobile company-NOM Toyota-ACC sued COMP reason-with

John-ga <u>soko / sono zidoosya gaisya</u>-o tyoosasiteiru no ?
John-NOM that:place that automobile company-ACC is:investigating COMP

'(Lit.) [For the reason that <u>which automobile company</u> sued Toyota last year], is John investigating <u>it / that automobile company</u>?'

And she argues, based on the contrast between (30a), (30b), and (31a) on the one hand, and (30c), (30d), and (31b) on the other, that E-type link based 'binding' is subject to the PF precedence constraint, and not possible in an environment where 'reconstruction' is necessitated.

(30) (= Ueyama 1998 (75)-(76), pp.158-159, slightly adapted)

  a. ?*Which evaluation of <u>that linguist</u> did <u>every linguist</u> insist that John had demanded?

  b. ?*A special evaluation of <u>that linguist</u>, <u>every linguist</u> insisted that John had demanded.

  c. Which evaluation of <u>him</u> did <u>every linguist</u> insist that John had demanded?

  d. A special evaluation of <u>him</u>, <u>every linguist</u> insisted that John had demanded.

(31) (= Ueyama 1998 (57)-(58), pp.149-150, slightly adapted)

  a *<u>Sono zidoosya gaisya</u>-no kogaisya-o <u>dono zidoosya gaisya</u>-ga
  that automobile company-GEN subsidiary-ACC which automobile company-NOM

  suisensita no ?
  recommended COMP

'Which automobile company recommended that automobile company's subsidiary?'

b. Soko-no   kogaisya-o   dono zidoosya gaisya-ga   suisensita
   that:place-GEN subsidiary-ACC which automobile company-NOM recommended

   no   ?
   COMP

'Which automobile company recommended its subsidiary?'

We are now ready to demonstrate the generalizations in (23). For a demonstration, it is necessary that a given anaphoric relation between a *wh*-word and a dependent term is of true binding, but not E-type link-based 'binding'. To ensure such, I will use examples where a potential dependent term precedes a given *wh*-word (i.e., environments where 'reconstruction' is forced), and since such examples can be easily constructed in Japanese, utilizing 'scrambling', but not in English, I only provide a demonstration in Japanese.[7]

Let us first observe that the question in (32a) can be replied by the pair-list answer in (32b).

(32) a. Seihin-o   subete-no kaisya-ga   doko-ni   okurikaesita ka osiete kudasai.
        product-ACC all-GEN   company-NOM where-DAT returned   Q teach please

    'Please tell me to whom every company returned a product.'

   b. Toyota-ga IBM-ni, Nissan-ga Toshiba-ni, Honda-ga Dell-ni   desu.
      Toyota-NOM IBM-DAT Nissan-NOM Toshiba-DAT Honda-NOM Dell-DAT COPULA

    'Toyota to IBM, Nissan to Toshiba, and Honda to Dell.'

---

[7]   I thank Ayumi Ueyama for pointing out to me (p.c. March 2001) that the generalizations in (23) can be illustrated, using 'scrambling' contexts, i.e., utilizing 'reconstruction' contexts.

Next, confirm that the question in (33a) is compatible with *doko* 'where' binding *soko* 'it'; we can, for example, use (33b) to answer (33a), intending that Toyota returned IBM's product to IBM.

(33) a. <u>Soko</u>-no   seihin-o   Toyota-ga <u>doko</u>-ni okurikaesita ka osiete
       that:place-GEN product-ACC Toyota-NOM where-DAT returned   Q teach

       kudasai.
       please

       'Please tell me to <u>whom</u> Toyota returned <u>its</u> product.'

    b. IBM(-ni) desu.
       IBM-DAT COPULA

       '(To) IBM.'

Now, let us consider the question in (34), which is the combination of (32a) plus the binding in (33a). Interestingly, (34) cannot be replied with pair-list answers like (32b), although it can be answered with a single answer like (33b).[8]

(34)   <u>Soko</u>-no   seihin-o   subete-no kaisya-ga   <u>doko</u>-ni okurikaesita ka
       that:place-GEN product-ACC all-GEN   company-NOM where-DAT returned   Q

       osiete kudasai.
       teach   please

       'Please tell me to <u>whom</u> every company returned <u>its</u> product.'

---

[8] Incidentally, the non-scrambling counterparts of (32a) and (34) may not contrast with each other in regard to the availability of pair-list readings, as illustrated in (i). This is not surprising since the anaphoric relation under discussion in (i-b) can be E-type link-based 'binding'.

(i)   a. Subete-no kaisya-ga   doko-ni   seihin-o   okurikaesita ka osiete kudasai.
       all-GEN   company-NOM where-DAT product-ACC returned   Q teach please
       'Please tell me to whom every company returned a product.'

    b. Subete-no kaisya-ga   <u>doko</u>-ni <u>soko</u>-no   seihin-o   okurikaesita ka osiete ku-
       dasai.
       all-GEN   company-NOM where-DAT that:place-GEN product-ACC returned   Q teach
       please
       'Please tell me to <u>whom</u> every company returned <u>its</u> product.'

On the other hand, the question in (34) can be replied with the functional answer in (35) with the interpretation that every company₁ returned its₂ product to a company₂ that it₁ has been doing business with for a long time. Hence, we have confirmed the generalizations in (23).

(35)   Soko-to   naganen torihikisiteiru   kaisya(-ni) desu.
         that:place-with long:time is:doing:business company-DAT COPULA

         '(To) a company with whom it has been doing business for a long time.'

The following set of examples further illustrates the generalizations in (23). The question in (36a) allows all of the answers in (37). However, when the *wh*-word binds a dependent term as in (36b), the single and functional answers in (37b) and (37c) are possible, but not the pair-list answer in (37a).

(36) a. Ronbun-o rei-no   hutatu-no kaisya-ga   dare-ni   happyoosaseta ka
         paper-ACC that-GEN two-GEN   company-NOM who-DAT made:present   Q

         osiete kudasai.
         teach   please

         'Please tell me who the two companies made present a paper.'

      b. <u>Soitu</u>-no   ronbun-o rei-no   hutatu-no kaisya-ga   <u>dare</u>-ni
         that:guy-GEN paper-ACC that-GEN two-GEN   company-NOM who-DAT

         happyoosaseta ka osiete kudasai.
         made:present   Q   teach please

         'Please tell me <u>who</u> the two companies made present <u>his or her</u> paper.'

(37) a. Toyota-ga John-ni Nissan-ga Ken-ni desu.
         Toyota-NOM John-DAT Nissan-NOM Ken-DAT COPULA

         'Toyota (made) John (do that), and Nissan Ken.'

b. John(-ni) desu.
   John-DAT COPULA

   '(To) John.'

c. Soko-no   yuusyuuna kenkyuuin(-ni) desu.
   that:place-GEN capable   researcher-DAT COPULA

   '(To) its capable researcher.'

We have thus observed that the generalizations in (23), repeated here, hold.

(23)   Let ρ be a *wh*-question whose configuration is [… QP [… WH …]] prior to

        A'-movement.

    a. When ρ is answered with pair-list answers, the *wh*-word cannot bind a

       dependent term.

    b. When ρ is answered with functional answers, the *wh*-word can still bind a

       dependent term.

5.2.3. Presence or absence of scope minimizing effects on negation

In this section, we will observe that the availability of pair-list readings is subject

to yet another condition for MINOR while that of functional readings is not. In particu-

lar, I will argue that the generalizations in (38) hold.

(38)   Let ρ be a *wh*-question whose configuration is [… QP [… WH …]] prior to

        A'-movement, where the verb of which the QP is an argument is negated.

    a. When ρ answered with pair-list answers, the scope of the negation is limited to

       the verb itself.

    b. When ρ is answered with functional answers, the scope of the negation is not

       limited to the verb itself.

First observe that the questions in (39a) and (40a) can be replied with both pair-list and functional answers: (39a), for example, can be answered by (39b) and (39c), and (40a) by (40b) and (40c).

(39) a. Tell me who every professor did not introduce to more than three companies.

b. Prof. Smith John, Prof. Brown Bill, and Prof. Johnson Susan.

c. Her or his favorite student.

(40) a. Tell me what the two professors did not recommend to three students.

b. Prof. Smith Syntactic Structure, Prof. Brown LGB.

c. A book written by their former student.

However, there is a difference between when (39a) and (40a) are answered by pair-list answers and when they are replied by functional answers regarding how wide the scope of the negation can be.

Here I explain the point in detail, using (39), but a similar remark also applies to (40). Regarding (39a), there are three logical scope orders among the two QPs and the negation, as listed in (41), provided *every professor* takes scope over *more than three companies*.

(41) a. *every > more than three >* negation

b. *every >* negation *> more than three*

c. negation *> every > more than three*

When the question in (39a) is replied by the pair-list answer in (39b), however, (41a) is the only possible scope orders among the three logically possible orders. That is, (39b) can be understood to mean (42a), but not (42b) or (42c).

(42) a. Each of Prof. Smith, Prof. Brown, and Prof. Johnson has more than three

companies to which he did not introduce the relevant student, where John is the

student relevant for Prof. Smith, Bill for Prof. Brown, and Susan for Prof.

Johnson.

b. For each of Prof. Smith, Prof. Brown, and Prof. Johnson, it is not the case that

he introduced the relevant student to more than three companies, where John is

the student relevant for Prof. Smith, Bill for Prof. Brown, and Susan for Prof.

Johnson.

c. It is not the case that each of Prof. Smith, Prof. Brown, and Prof. Johnson

introduced the relevant student to more than three companies, where John is the

student relevant for Prof. Smith, Bill for Prof. Brown, and Susan for Prof.

Johnson.

By contrast, when (39a) is responded by the functional answer in (39c), the scope

orders, (41a), (41b) and marginally (41c) are available; i.e., (39c) can be taken to mean

(43a), (43b), or marginally (43c).[9]

(43) a. Each of Prof. Smith, Prof. Brown, and Prof. Johnson has more than three

companies to which he did not introduce his favorite student.

b. For each of Prof. Smith, Prof. Brown, and Prof. Johnson, it is not the case that

he introduced his favorite student to more than three companies.

---

[9]   In Chapter 3:Section 3.4, I have maintained that an object QP cannot raise above its clause-mate
verbal negation via covert movement. Given this, we are lead to conclude that when (39a) is replied
by the functional answer, (39c), with the interpretation of (43a), the scope interaction between *every
professor* and *who* must involve MINOR.

    c. It is not the case that each of Prof. Smith, Prof. Brown, and Prof. Johnson

       introduced his favorite student to more than three companies.

It is perhaps worth pointing out that the assertive counterparts of the embedded

questions in (39a) and (40a) allow all of the scope orders that are possible when the

questions are replied by functional answers. This is illustrated in (44).

(44)   a. Every professor did not introduce John to more than three companies.

     b. The two professors did not recommend LGB to three students.

(44a), for example, allows the scope orders, (41a), (41b), and marginally (41c); i.e.,

(44a) can be construed as (45a), (45b), or possibly (45c).

(45)   a. Each professor has more than three companies to which he or she did not

       introduce John.

     b. For each professor, it is not the case that he or she introduced John to more

       than three companies.

     c. It is not the case that each professor introduced John to more than three

       companies.

The generalizations in (38) are also supported in Japanese. The questions in (46a)

and (47a), for example, can be replied with both pair-list and functional answers: both

(46b) and (46c) are appropriate for (46a), and similarly, both (47b) and (47c) are felici-

tous for (47a). However, the scope range of the negation in (46a) and (47b) differs de-

pending on whether they are responded by pair-list answers or functional answers.

(46)   a. Nihon seihu-wa   [subete-no oote denki gaisya-ga   doko-ni
       Japan government-TOP all-GEN   large electric company-NOM where-DAT

       sanninizyoo-no kenkyuusya-o okurikom-ana-katta] koto-o   mondai-ni
       three:more-GEN researcher-ACC send-NEG-PAST   fact-ACC problem-DAT

siteiru no desu ka.
is:doing COMP COPULA Q

'(Lit.) Japanese government has been treating as a problem the fact that [every large electric company did not send three or more researchers to whom]?'

b. Sony-ga   Itaria-ni, Toshiba-ga Amerika-ni, Panasonic-ga   Doitsu-ni
Sony-NOM Italy-DAT Toshiba-NOM USA-DAT   Panasonic-NOM Germany-DAT

desu.
COPULA

'Sony to Italy, Toshiba to USA, and Panasonic to Germany.'

c. Soko-no   kenkyuu-ni kyoomi-o   simesiteiru kuni(-ni)   desu.
that:place-GEN research-DAT interest-ACC is:showing   country-DAT COPULA

'(To) a country that is interested in its research.'

(47) a. Mosi [rei-no hutatu-no ginkoo-ga mittu-no kaisya-ni   doko-o
         if   the-GEN two-GEN   bank-NOM three-GEN company-DAT where-ACC

syookaisi-na-katta ra, zidoosya sangyoo-wa ayaukunaru no   desu   ka.
introduce-NEG-PAST if   automobile industry-TOP is:jeopardized COMP COPULA Q

'(Lit.) If [the two banks does not introduce whom to three companies], the automobile industry will be jeopardized?'

b. Sumitomo ginkoo-ga Toyota-o,   Mitsubishi ginkoo-ga Nissan-o   desu.
Sumitomo bank-NOM Toyota-ACC Mitsubishi bank-NOM Nissan-ACC COPULA

'Sumitomo Bank Toyota, and Mitsubishi Bank Nissan.'

c. Soko-ga   naganen torihikisiteiru   zidoosya gaisya(-o)   desu.
that:place-NOM long:time is:doing:business automobile company-ACC COPULA

'An automobile company that it has been doing business with for a long time.'

Take the question in (46a) as an example. There are three logical scope orders among the two QPs and the negation, as listed in (48), provided that *subete-no oote denki gais*ya 'every large electric company' takes scope above *sanninizyoo-no ken-kyuusya* 'three or more researchers'.

(48) a. *subete* 'all' > *sanninizyoo* 'three or more' > negation

   b. *subete* 'all' > negation > *sanninizyoo* 'three or more'

   c. negation > *subete* 'all' > *sanninizyoo* 'three or more'

When (46a) is replied by the pair-list answer in (46b), however, the possible scope order is only (48a) among the three scope orders. By contrast, when (46a) is answered by the functional answer in (46c), the scope order in (48c) is possible in addition to that in (48a).[10]

Furthermore, the assertive counterparts of the embedded questions in (46a) and (47a) allow the same scope orders that are possible when the questions are replied with functional answers, as illustrated in (49).

(49) a. Nihon seihu-wa   [subete-no oote denki   gaisya-ga   Doitsu-ni
      Japan   government-TOP all-GEN   large electric company-NOM Germany-DAT

      sanninizyoo-no kenkyuusya-o okurikom-ana-katta] koto-o mondai-ni
      three:more-GEN researcher-ACC send-NEG-PAST   fact-ACC problem-DAT

      siteiru
      is:doing

      'Japanese government has been treating as a problem the fact that [every large electric company did not send three or more researchers to Germany].'

   b. Mosi [rei-no   hutatu-no ginkoo-ga mittu-no   kaisya-ni   Toyota-o
      if   the-GEN two-GEN   bank-NOM three-GEN company-DAT Toyota-ACC

      syookaisi-na-katta] ra, zidoosya   sangyoo-wa ayaukunaru   daroo.
      introduce-NEG-PAST if automobile industry-TOP is:jeopardized probably

---

10   As mentioned in FN 20 in Chapter 2, I suspect that the contrast between English and Japanese regarding the absence or presence of the *subject>negation>object* order is derived from a fundamental difference between the two languages, namely the presence or absence of subject raising (cf. Fukui 1986, Kitagawa 1986, Kuroda 1988).

'If [the two banks does not introduce Toyota to three companies], the automobile industry will probably be jeopardized.'

We have thus confirmed that the generalizations in (38), repeated here, hold.

(38)   Let ρ be a *wh*-question whose configuration is [… QP [… WH …]] prior to

A'-movement, where the verb of which the QP is an argument is negated.

   a. When ρ answered with pair-list answers, the scope of the negation is limited to

   the verb itself.

   b. When ρ is answered with functional answers, the scope of the negation is not

   limited to the verb itself.

5.2.4. Summary

To sum up Sections 5.2.1-5.2.3, we have observed that pair-list readings are possible only if the necessary conditions for a QP to bear scope due to MINOR are met, but the availability of functional readings is not subject to such conditions. In particular, I have demonstrated that the generalizations in (4), repeated here, hold.

(4)   a. A *wh*-question whose configuration is [… QP [… WH …]] prior to A'-

   movement can be answered with pair-list answers only if all of the conditions,

   (i)-(iii), are met.

   b. A *wh*-question whose configuration is [… QP [… WH …]] prior to A'-

   movement can be answered with functional answers even if it is not the case

   that all of the conditions, (i)-(iii), are met.

   i. The speaker refers to a specific group with the QP.

   ii. If there is a potential dependent term δ, then the *wh*-word does not bind δ.

iii. If the verb of which the QP is an argument is negated, the scope of the

verbal negation is limited to the verb itself.

I take the generalizations in (4) as evidence that functional readings may emerge through LF compositional computation while pair-list readings must be due to MINOR by which the QP takes wide scope with respect to the *wh*-word.[11]

5.3. Predictions and confirmation

To paraphrase the conclusion in the previous section, functional readings need not be due to MINOR, but pair-list readings must be, in particular MINOR by which the QP takes wide scope with respect to the *wh*-word. In Chapter 3, I have spelled out a number of properties that are attributed to MINOR (although the rigorous theoretical characterization of MINOR was left open). From these properties, several generalizations are predicted to hold. In the following subsections, I will consider three such predictions and demonstrate that they are indeed borne out, providing further support for the conclusion in Section 5.2.

5.3.1. CM-comparatives

In Chapter 3:Sectoin 3.3, I have concluded (50), where WSR<α, β> signifies the wide scope reading of α over β. As the definition of A-position, I have adopted (51).[12]

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[11]   Aoun & Li (2003:Section 3.2) also argue based on Lebanese Arabic that pair-list readings must be distinguished from functional readings. However, their claim is rather different from what is presented in this chapter; for they attempt to capture the distinction between the two readings within a theory of the grammar, stipulating syntactic principles. Since I do not have a means to examine Lebanese Arabic empirical materials in detail, I leave their claim unevaluated in this work.

[12]   See also FN 6 in Chapter 3.

(50)   (= Chapter 3 (37))

When WSR<α, β> obtains in a given clause due to MINOR, where α and β are

QPs, both α and β stay in A-positions at LF.

(51)   (= Chapter 3 (6))

A position α is an A-position if, and only if α is a theta position of a verb or a

case position.

Given that pair-list readings must be due to MINOR while functional readings need not,

we predict that pair-list readings fail to obtain if the QP or the *wh*-word is not in an A-

position at LF, while the availability of functional readings may not be affected by such

a condition. To verify the prediction, I will demonstrate that the generalization in (52)

holds.

(52)   For a *wh*-question ρ whose configuration is [… QP [… WH …]] prior to A'-

movement, if the QP or the *wh*-word is not in an A-position at LF, ρ may be

replied by functional answers, but not by pair-list answers.

To illustrate that the generalization in (52) hold, we must utilize a construction in

which an element is forced not to be in an A-position for an independent syntactic rea-

son. As in Chapter 3, I assume that a CM-comparative, exemplified by (53), is one such

instance.[13]

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[13]   As mentioned in Chapter 3, FN 8, the locus NPs in a CM-comparative must be dative-marked (or
marginally accusative-marked). Accordingly, in all of the CM-comparatives we will consider, the
locus NPs are dative-marked.

(53)   (= Chapter 3 (7))

[IP [AdvP [CP John-ni   yorimo] sakini] [IP Kimura kyoozyu-ga   Bill-ni
              John-DAT than   early   Kimura professor-NOM Bill-DAT

Mary-o   syookaisita]] (to siyoo).
Mary-ACC introduced   that suppose

'(Suppose that) [IP [IP Prof Kimura introduced Mary to Bill] [AdvP earlier [CP than to John]]].'

Adopting the LF copying analysis in Hoji 1998b, (53), for example, is analyzed as (54).[14, 15]

(54)   (= Chapter 3 (8))

a. Before *to Bill* (the [L]NP of the antecedent clause) raises

[IP [AdvP [CP to John [C' [IP   ec   ] than]] early] [IP Prof. Kimura introduced

Mary to Bill]]

b. After *to Bill* (the [L]NP of the antecedent clause) raises

[IP [AdvP [CP to John [C' [IP   ec   ] than]] early] [IP to Bill$_1$ [IP Prof. Kimura

introduced Mary t$_1$]]]

c. After LF copying takes place (= LF)

[IP [AdvP [CP to John$_1'$ [C' [IP Prof. Kimura introduced Mary t$_1$] than]] early] [IP to

Bill$_1$ [IP Prof. Kimura introduced Mary t$_1$]]]

---

[14]   The choice between LF copying and PF deletion does not affect any of the ensuring discussions. See also FN 11 and FN 12 in Chapter 3.

[15]   As noted in Chapter 3:Section 3.2.1, Hoji claims this analysis based on the assumption that the comparative clause of a CM-comparative is identical to its antecedent clause at LF, except the NPs that serve as the locus of comparison, which he independently substantiates on the basis of various kinds of bound variable anaphora (cf. Hoji 1998b:Section 3.3, and Hoji 2002:Sections 3.4, 4.2, and 5.2). See also the quantifier-scope-based argument I put forth for this analysis in Chapter 3:Section 3.2.1.

Crucially, under this analysis the NP that serves as the locus of comparison in the antecedent clause (i.e., *Bill* in the case of (53)) is forced to raise so as to avoid non-constituent copying and cannot stay in an A-position. In the following discussion, as in Chapter 3, I will refer to NPs that serve as the locus of comparison as *locus NPs*, or simply ^{L}*NPs,* e.g., *John* and *Bill* in (53).

I also assume, following Hoji 2002, that Non-CM-comparatives exemplified by (55), on the other hand, do not involve LF copying (or PF deletion), despite the fact that they are only different from CM-comparatives in the presence or absence of the case-marker attached to the locus NP in the comparative clause.[16] Hence, we may assume that Non-comparatives do not prevent an element from staying in an A-position in the way CM-comparatives do.

(55)   [$_{IP}$ [$_{AdvP}$ [$_{CP}$ John yorimo] sakini] [$_{IP}$ Kimura kyoozyu-ga   Bill-ni   Mary-o
                      John   than   early   Kimura professor-NOM Bill-DAT Mary-ACC

syookaisita]] (to   siyoo).
introduced   that suppose

'(Suppose that) [$_{IP}$ [$_{IP}$ Prof Kimura introduced Mary to Bill] [$_{AdvP}$ earlier [$_{CP}$ than John]]].'

Under the analyses of CM-comparatives and Non-CM-comparatives sketched above, we expect from (52) that the generalizations in (56) hold. As we will observe directly, such is indeed the case.

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[16]   As I mentioned in Chapter 3:Section 3.2.1, Hoji's arguments for this position are based on various kinds of bound variable anaphora. See also the scope-based argument I put forth for this view in Chapter 3:Section 3.2.1 and FN 17 in the same chapter.

(56) a. A *wh*-question, which is a CM-comparative whose antecedent clause is […

      QP [… WH …]], where the QP or the *wh*-word is the locus NP, cannot be

      answered by pair-list answers but may be answered by functional answers.

   b. A *wh*-question, which is a Non-CM-comparative whose antecedent clause is [

      … QP [… WH …]], where the QP or the *wh*-word is the locus NP, may be

      answered by pair-list and functional answers.

First the *wh*-questions in (57), which are not comparative constructions, can be re-

plied by pair-list answers. (58a) and (58b), for example, are felicitous answers to (57a)

and (57b) respectively.

(57) a. Subete-no kaisya-ga   dare-ni   kenkyuu keikaku-o motikaketa ka
         all-GEN   company-NOM who-DAT research plan-ACC brought   Q

         osiete kudasai.
         teach please

         'Please tell me to whom every company brought a research plan.'

   b. Rei-no hutatu-no daigaku-ga   doko-ni   gakusei-o suisensita   ka
      the-GEN two-GEN   university-NOM where-DAT student-ACC recommended Q

      osiete kudasai.
      teach   please

      'Please tell me to whom the two universities recommended students.'

(58) a. Toyota-ga   Yamada kyoozyu-ni, Nissan-ga   Tanaka kyoozyu-ni,
         Toyota-NOM Yamada professor-DAT Nissan-NOM Tanaka professor-DAT

         Honda-ga   Bessyo kyoozyu-ni   desu.
         Honda-NOM Bessyo professor-DAT COPULA

         'Toyota to Prof. Yamada, Nissan to Prof. Tanaka, and Honda to Prof. Bessyo.'

   b. Kyoto daigaku-ga   Nissan-ni Kyusyu daigaku-ga   Honda-ni desu.
      Kyoto university-NOM Nissan-DAT Kyusyu university-NOM Honda-DAT COPULA

      'Kyoto University to Nissan, and Kyusyu University to Honda.'

Now consider the *wh*-questions in (59), which are CM-comparative counter-
parts of the questions in (57), where the *wh*-word is the locus NP of the antecedent
clause and hence cannot stay in an A-position.

(59) a. Subete-no kaisya-ga [AdvP [CP Kimura kyoozyu-ni   yorimo] sakini] dare-ni
          all-GEN   company-NOM   Kimura professor-DAT than   early who-DAT

          kenkyuu keikaku-o motikaketa ka osiete kudasai.
          research plan-ACC brought   Q teach please

          'Please tell me to whom every company brought a research plan [AdvP earlier [CP
          than to Prof. Kimura]].'

       b. Rei-no hutatu-no daigaku-ga   [AdvP [CP Toyota-ni   yorimo] sakini] doko-ni
          the-GEN two-GEN   university-NOM   Toyota-DAT than   early where-DAT

          gakusei-o   suisensita   ka osiete kudasai.
          student-ACC recommended Q teach   please

          'Please tell me to whom the two universities recommended students [AdvP earlier
          [CP than to Toyota]].'

Unlike the *wh*-questions in (57), they cannot be responded with pair-list answers. For
instance, it is difficult to answer (59a) and (59b) with (58a) and (58b), respectively.

However, the Non-CM-comparative counterparts seem able to be replied with
pair-list answers. We can, for example, felicitously respond to (60a) and (60b) with the
pair-list answers, (58a) and (58b), respectively.

(60) a. Subete-no kaisya-ga [AdvP [CP Kimura kyoozyu yorimo] sakini] dare-ni
          all-GEN   company-NOM   Kimura professor than   early   who-DAT

          kenkyuu keikaku-o motikaketa ka osiete kudasai.
          research plan-ACC brought   Q teach please

          'Please tell me to whom every company brought a research plan [AdvP earlier [CP
          than Prof. Kimura]].'

       b. Rei-no hutatu-no daigaku-ga [AdvP [CP Toyota yorimo] sakini] doko-ni
          the-GEN two-GEN   university-NOM   Toyota   than   early   where-DAT

gakusei-o   suisensita   ka osiete kudasai.
student-ACC recommended Q teach   please

'Please tell me to whom the two universities recommended students [AdvP earlier [CP than Toyota]].'

What is of our interest is that the CM-comparative questions in (59) can be replied with functional answers just in the same way as the *wh*-questions in (57) and the Non-CM-comparative counterparts in (60) can. We can, for example, use (61a) to reply to (57a), (59a), and (60a), intending the value of *soko* 'it' to depend on the individuals de-noted by *subete-no kaisya* 'every company'. Similarly, (61b) can be utilized to answer (57b), (59b), and (60b), with *soko* 'it' being bound by *rei-no hutatu-no daigaku* 'the two universities'.

(61) a. Soko-no   kenkyuu-ni kyooryokusita koto-ga aru kyoozyu(-ni) desu.
           that:place-GEN research-DAT cooperated   fact-NOM exist professor-DAT COPULA

      '(To) a professor that has participated in its research.'

      b. Soko-ni   kihu-o   okutteiru kaisya(-ni)   desu.
           that:place-DAT donation-ACC is:sending company-DAT COPULA

      '(To) a company that has being donating money to it.'

We have so far observed that when the *wh*-word in [… QP [… Wh …]] prior to A'-movement is forced not to be in an A-position, functional readings can obtain, but pair-list readings cannot. The same holds in the situation where the QP is disallowed to stay in an A-position.

First observe that the *wh*-questions in (62), which are not comparative construc-tions, can be answered with pair-list readings in (63).

(62) a. Seihu-ga   subete-no kaisya-ni   doko-o   hihansaseta ka
           governement-NOM all-GEN   company-DAT where-ACC made:criticize Q

osiete kudasai.
teach please

'Please tell me whom the government made every company criticize.'

b. NSF-ga   rei-no   hutatu-no daigaku-ni   dare-o   ano syoo-no
   NSF-NOM the-GEN two-GEN   university-DAT who-ACC that award-GEN

koohosya tosite suisensaseta   ka osiete kudasai.
nominee   as   made:recommend Q teach please

'Please tell me whom NSF made the two universities nominate for that award.'

(63) a. Nissan-ni   Sony-o,   Honda-ni Toshiba-o,   Suzuki-ni   Panasonic-o
        Nissan-DAT Sony-ACC Honda-DAT Toshiba-ACC Suzuki-DAT Panasonic-ACC

desu.
COPULA

'(It made) Nissan (criticize) Sony, Honda Toshiba, and Suzuki Panasonic.'

b. UCLA-ni   Smith kyoozyu-o   Stanford-ni   Brown kyoozyu-o   desu.
   UCLA-DAT Smith professor-ACC Stanford-DAT Brown professor-ACC COPULA

'(It made) UCLA (nominate) Prof. Smith, and Stanford Prof. Brown.'

However, the *wh*-questions in (64), the CM-comparative counterparts where the

QP is the locus NP of the antecedent clause, cannot be answered by pair-list answers.

For example, it is not possible to answer (64a) and (64b) with (63a) and (63b), respec-

tively.

(64) a. Seihu-ga   [AdvP [CP Toyota-ni   yorimo] sakini] subete-no kaisya-ni
        governement-NOM   Toyota-DAT than   early   all-GEN   company-DAT

doko-o   hihansaseta   ka osiete kudasai.
where-ACC made:criticize Q teach please

'Please tell me whom the government made every company criticize [AdvP
earlier [CP than Toyota]].'

b. NSF-ga [AdvP [CP USC-ni   yorimo] sakini] rei-no   hutatu-no daigaku-ni
   NSF-NOM   USC-DAT than   early   the-GEN two-GEN   university-DAT

    dare-o   ano syoo-no   koohosya tosite suisensaseta   ka osiete kudasai.
    who-ACC that award-GEN nominee   as   made:recommend Q teach please

    'Please tell me whom NSF made the two universities nominate for that award
    [AdvP earlier [CP than USC]].'

By contrast, the Non-CM-comparative counterparts in (65) can be replied with the

pair-list answers in (63).

(65) a. Seihu-ga   [AdvP [CP Toyota yorimo] sakini] subete-no kaisya-ni
        governement-NOM   Toyota than   early   all-GEN   company-DAT

        doko-o   hihansaseta   ka osiete kudasai.
        where-ACC made:criticize Q teach please

        'Please tell me whom the government made every company criticize [AdvP
        earlier [CP than Toyota]].'

    b. NSF-ga [AdvP [CP USC yorimo] sakini] rei-no hutatu-no daigaku-ni
        NSF-NOM   USC than   early   the-GEN two-GEN   university-DAT

        dare-o   ano syoo-no   koohosya tosite suisensaseta   ka osiete kudasai.
        who-ACC that award-GEN nominee   as   made:recommend Q teach   please

        'Please tell me whom NSF made the two universities nominate for that award
        [AdvP earlier [CP than USC]].'

Just as the above case, the CM-comparative questions in (64) can be answered

with functional answers in the same way as the *wh*-questions in (62) and the Non-CM-

comparative counterparts in (65) can. (62a), (64a), and (65a) can be answered, for ex-

ample, with (66a) where the value of *soko* 'it' depends on the individuals denoted by *su-*

bete-no kaisya 'every company', and similarly, (62b), (64b), and (65b) can be replied

with (66b) where the value of *soko* 'it' depends on the individuals denoted by *rei-no hu-*

tatu-no daigaku 'the two universities.'

(66) a. Soko-no   raibaru gaisya(-o)   desu.
        that:place-GEN rival   company-ACC COPULA

        'Its rival company.'

b. Soko-o   syootyoosuru kenkyuusya(-o) desu.
   that:place-ACC represent   researcher-ACC   COPULA

'Its representative researcher.'

We have thus demonstrated that the generalizations in (56), repeated here, hold, and since (56) is based on the generalization in (52), also repeated here, the preceding discussion serves as evidence in support of (52).

(56)   a.   A *wh*-question, which is a CM-comparative whose antecedent clause is [… QP

[… WH …]], where the QP or the *wh*-word is the locus NP, cannot be

answered by pair-list answers but may be answered by functional answers.

b.   A *wh*-question, which is a Non-CM-comparative whose antecedent clause is [

… QP [… WH …]], where the QP or the *wh*-word is the locus NP, may be

answered by both pair-list and functional answers.

(52)   For a *wh*-question ρ whose configuration is [… QP [… WH …]] prior to A'-

movement, if the QP or the *wh*-word is not in an A-position at LF, ρ may be

replied by functional answers, but not by pair-list answers.

The following English empirical materials seem to confirm (52) as well. First, compare the questions in (67) with those in (68). The former differs from the latter only with regard to the presence or absence of a preposition in the comparative clause. As in Chapter 3:Section 3.2.1, I will refer to the former as *PP-comparative* and the latter as *Non-PP comparative*.

(67)   a.   Tell me to whom every company brought a research plan earlier than to Prof.

Johnson.

    b. Tell me to whom the two universities recommended students earlier than to

       Toyota.

(68) a. Tell me to whom every company brought a research plan earlier than Prof.

       Johnson.

    b. Tell me to whom the two universities recommended students earlier than

       Toyota.

Despite their surface similarity, PP-comparatives contrast with Non-PP-comparatives in regard to the availability of pair-list readings. The pair-list answers, (69a) and (69b), for example, cannot be used to reply to the questions, (67a) and (67b); however, they are felicitous answers for the questions, (68a) and (68b).

(69) a. Toyota to Prof. Smith, Nissan to Prof. Kimura, Honda, to Prof. Brown, and

       Mazda to Prof. Yamada.

    b. USC to Honda, and UCLA to Nissan.

On the other hand, both PP-comparatives and Non-PP-comparatives allow functional readings. We can, for example, use (70a) to reply to (67a) and (68a), and (70b) to answer (67b) and (68b).

(70) a. A professor who has participated in its research.

    b. Their favorite company.

To the extent that PP-comparatives are analyzed on a par with Japanese CM-comparatives, while Non-PP-comparatives are (or can be) analyzed on a par with Japanese Non-CM-comparatives, the contrast we have just observed can be taken as evidence in support of the generalization in (52).

5.3.2. Domain restriction

In Chapter 3:Sectoin 3.5.1, I have concluded (71).

(71)   (= Chapter3 (55))

MINOR operates on a domain consisting of A_1, A_2, ... A_n, where A_1, A_2, ... A_n

are major constituents of the same clause.

Given that pair-list readings must be due to MINOR while functional readings need not, we predict that pair-list readings are not possible if the QP and *wh*-word under consideration are not clause-mates, but functional readings may not be subject to such a restriction. To verify the prediction, I demonstrate that the generalization in (72) holds.

(72)   A *wh*-question whose configuration is [… QP [… WH …]] prior to A'-
movement, where the QP and the *wh*-word are not clause-mates, can be replied
by functional answers but not by pair-list answers.

First, observe that the questions in (73) can be replied with both pair-list and functional answers. For example, both (74a) and (75a) are felicitous answers for (73a), and similarly, both (74b) and (75b) can be utilized to answer (73b).

(73)   a. Tell me to whom every male student talked.

b. Tell me who the two newspaper companies have been supporting.

(74)   a. John to Mary, Bill to Susan and Ken to Kati.

b. NY Times Sony, and LA Times Panasonic.

(75)   a. To his favorite female student.

b. A company that has contributed to the development of their facilities.

However, when the QP and *wh*-word under discussion are not clause-mates in a given question, functional answers can obtain while pair-list answers cannot. The ques-

tions, (76a) and (76b), for example, can be responded by the functional answers, (75a) and (75b), but not by the pair-list answers, (74a) and (74b).

(76)   a. Tell me to whom every male student said that Prof. Kimura talked.

     b. Tell me who the two newspaper companies think that the government has been

       supporting.'

The generalization in (72) also holds in Japanese. The questions in (77), where the QP and the *wh*-word under consideration are clause-mates, can be replied by both pair-list and functional answers, e.g., (77a) can be answered by both (78a) and (79a), and (77b) by both (78b) and (79b).

(77)   a. Subete-no dansi gakusei-ga   dare-ni   hanasikaketa ka osiete kudasai.
       all-GEN   male student-NOM who-DAT talked   Q teach please

       'Please tell me to whom every male student talked.'

     b. Rei-no hutatu-no sinbunsya-ga   doko-o   siensiteiru ka osiete
       the-GEN two-GEN   newspaper:company-NOM where-ACC is:supporting Q teach

       kudasai.
       please

       'Please tell me who the two newspaper companies have been supporting.'

(78)   a. John-ga   Mary-ni, Bill-ga   Susan-ni, Ken-ga   Kati-ni   desu.
       John-NOM Mary-DAT Bill-NOM Susan-DAT Ken-NOM Kati-DAT COPULA

       John to Mary, Bill to Susan and Ken to Kati.'

     b. Asahi shinbun-ga   Sony-o   Yomiuri shinbun-ga   Panasonic-o
       Asahi newspaper-NOM Sony-ACC Yomiuri newspaper-NOM Panasonic-ACC

       desu.
       COPULA

       'Asahi newspaper company Sony, and Yomiuri newspaper company
       Panasonic.'

(79) a. Soitu-ga   itiban sukina zyosi   gakusei(-ni) desu.
        that:guy-NOM most   favorite female student-DAT   COPULA

        '(To) his most favorite female student.'

     b. Soko-no   setubi-no   hatten-ni   kookensita kaisya(-o)   desu.
        that:place-GEN facility-GEN development-DAT contributed company-ACC COPULA

        'A company that has contributed to the development of its facilities.'

However, the questions in (80), where the QP and *wh*-word under discussion are not clause-mates, can be responded by functional answers but not by pair-list answers. We can, for example, use (79a), but not (78b), to answer (80a). Similarly, (79b), but not (78b), can be utilized to respond to (80b).

(80) a. Subete-no dansi gakusei-ga   Kimura sensei-ga   dare-ni   hanasikaketa to
        all-GEN   male student-NOM Kimura teacher-NOM who-DAT talked   COMP

        itteita   ka osiete kudasai.
        was:saying Q teach   please

        'Please tell me to whom every male student said that Prof. Kimura talked.'

     b. Rei-no   hutatu-no sinbunsya-ga   seihu-ga   doko-o
        The-GEN two-GEN newspaper:company-NOM government-NOM where-ACC

        siensiteiru   to   hoodoosita ka osiete kudasai.
        is:supporting COMP reported   Q teach please

        'Please tell me who the two newspaper companies reported that the government has been supporting.'

We have thus confirmed another generalization that follows from the thesis that pair-list readings must be due to MINOR while functional readings need not.

5.3.3. Single occurrence

In Chapter 3:Sectoin 3.5.1, I have concluded (81), where the domain of MINOR consists of $A_1, A_2, ... A_n$, and $A_1, A_2, ... A_n$ are major constituents of the same clause, cf. (71).

(81)   (= Chapter 3 (56))

MINOR is an operation that makes one QP to take clausal scope and is allowed only once per its domain.

Given that pair-list readings must be due to MINOR, in particular MINOR by which the QP takes wide scope with respect to the *wh*-word, while functional readings need not, we predict from (81) that multiple occurrences of pair-list readings are not possible in a given domain, but those of functional readings may be possible. In support of the prediction, I will demonstrate that the generalizations in (82) hold.

(82)   In a *wh*-question whose configuration is [… QP_α [… QP_β [… WH …]]] prior to A'-movement,

a. the pair-list reading based on the scope interaction between the QP_α and the *wh*-word cannot co-occur with that based on the scope interaction between the QP_β and the *wh*-word; however,

b. the functional reading based on the scope interaction between the QP_α and the *wh*-word can co-occur with that based on the scope interaction between the QP_β and the *wh*-word.

First, the questions in (83), in which the subject and the indirect object are QPs and the direct object is a *wh*-word, support pair-list readings based on the scope interaction between the subject QP and the *wh*-word, e.g, (83a) and (83b) can be answered by (84a) and (84b), respectively.

(83) a. Subete-no gakusei-ga   rei-no   hutatu-no kaisya-ni   nani-o   okurikaesita
        all-GEN   student-NOM that-GEN two-GEN   company-DAT what-ACC returned

      ka osiete kudasai.
      Q teach please

'Please tell me what every student has returned to the two companies.'

b. Abe hooritu zimusyo to   Bekkyo hooritu zimusyo-ga rei-no   hutari-no
   Abe law   office   and Bekkyo law   office-NOM the-GEN two-GEN

   gakusei-ni   doko-o   uttaesaseta ka osiete kudasai.
   student-DAT where-ACC made:sue   Q teach please

   'Please tell me who Abe law office and Bekkyo law office made the two
   students sue.'

(84) a. John-ga   konpyuutaa-o Bill-ga   sutereo-o Ken-ga   terebi-o   desu.
     John-NOM computer-ACC Bill-NOM stereo-ACC Ken-NOM television-ACC COPULA

     'John a computer, Bill a stereo set, and Ken a television.'

b. Abe hooritu zimusyo-ga Toyota-o,   Bekkyo hooritu zimusyo-ga Nissan-o
    Abe law   office-NOM Toyota-ACC Bekkyo law   office-NOM Nissan-ACC

    desu.
    COPULA

    'Abe law office Toyota and Bekkyo law office Nissan'

Second, the same questions also support pair-list readings based on the scope interaction between the indirect object QP and the *wh*-word. For example, (83a) and (83b) can be answered by (85a) and (85b), respectively.

(85) a. Sony-ni   konpyuutaa-o Panasonic-ni sutereo-o desu.
     Sony-DAT computer-ACC Panasonic-DAT stereo-ACC COPULA

     'To Sony a computer, and to Panasonic a stereo set.'

b. John-ni   Toyota-o   Bill-ni   Nissan-o   desu.
    John-DAT Toyota-ACC Bill-DAT Nissan-ACC COPULA

    '(They made) John (sue) Toyota, and Bill Nissan.'

However, the two instances of pair-list readings, which we have observed independently, cannot be supported simultaneously. (83a), for example, cannot be replied with (86a), and similarly, (83b) cannot be answered by (86b).

(86) a. John-ga   Sony-ni   konpyuutaa-o Panasonic-ni   sutereo-o,   Bill-ga
       John-NOM Sony-DAT computer-ACC Panasonic-DAT stereo-ACC Bill-NOM

       Sony-ni   sutereo-o Panasonic-ni terebi-o   Ken-ga   Sony-ni
       Sony-DAT stereo-ACC Panasonic-DAT television-ACC Ken-NOM Sony-DAT

       terebi-o   Panasonic-ni   sutereo-o desu.
       television-ACC Panasonic-DAT stereo-ACC COPULA

       '(Lit.) John (returned) to Sony a computer and to Panasonic a stereo set, Bill
       (returned) to Sony a stereo set and to Panasonic a television, and Ken
       (returned) to Sony a television and to Panasonic a stereo set.'

   b. Abe hooritu zimusyo-ga John-ni   Toyota-o   Bill-ni   Honda-o,   Bekkyo
      Abe law   office-NOM   John-DAT Toyota-ACC Bill-DAT Honda-ACC Bekkyo

      hooritu zimusyo-ga John-ni   Honda-o   Bill-ni   Nissan-o   desu.
      law   office-NOM John-DAT Honda-ACC Bill-DAT Nissan-ACC COPULA

      'Abe law office (made) John (sue) Toyota and Bill Honda, Bekkyo law office
      (made) John (sue) Honda and Bill Nissan.'

On the other hand, the questions in (83) allow two instances of functional readings

simultaneously, i.e., the functional reading based on the scope interaction between the

subject QP and the *wh*-word can co-occur with that based on the scope interaction be-

tween the indirect object and the *wh*-word. We can, for example, answer (83a) with

(87a), intending that each student$_1$ returned to each of the two companies$_2$ its$_2$ computer

that he$_1$ purchased after bargaining. Similarly, (87b) can be used to answer (83b), in-

tending that each of Abe law office and Bekkyo law office$_1$ made each of the two stu-

dents$_2$ sue a company that faired him$_2$ in the past on the basis of its$_1$ advise.

(87) a. Soitu-ga   negitte katta soko-no   konpyuutaa(-o) desu.
        that:guy-NOM bargain bought that:place-GEN computer-ACC   COPULA

        'Its computer that he purchased after bargaining.'

   b. Kakoni soko-no   sizi-de   soitu-o   kubinisita kaisya(-o)   desu.
      past   that:place-GEN advice-with that:guy-ACC fired   company-ACC COPULA

'A company that fired him or her in the past on the basis of its advice.'

We can also illustrate the generalization in (82) in English. The questions, (88a) and (88b), for example, support both pair-list readings based on the scope interaction between the subject QP and the *wh*-word and those based on the scope interaction between the direct object QP and the *wh*-word.

(88) a. Tell me to whom every professor introduced the two students.

b. Tell me to whom the two computer companies recommended every Japanese automobile company.

(88a), for example, can be replied by either (89a) or (90a), and similarly, we can answer (88b) with either (89b) or (90b).

(89) a. Prof. Kimura to Toyota, Prof. Smith to Nissan, Prof. Brown to Honda.

b. IBM to Asahi Beer Co. and Toshiba to Kirin Beer Co.

(90) a. John to Toyota and Bill to Nissan.

b. Toyota to Asahi Beer Co., Nissan to Kirin Beer Co., Honda to Sapporo Beer Co., Mazda to Ebisu Beer Co.

However, the simultaneous occurrence of the two instances of pair-list readings, which we have observed independently, is not possible. For example, it is not possible to answer the questions, (88a) and (88b), with (91a) and (91b) respectively.

(91) a. Prof. Kimura introduced John to Toyota and Bill to Nissan, Prof. Smith introduced John to Honda and Bill to Toyota, and Prof. Brown introduced John to Honda, and Bill to Nissan.

b. IBM recommended Toyota to Asahi Beer Co., Nissan to Kirin Beer Co., Honda to Sapporo Beer Co., Mazda to Ebisu Beer Co., and Toshiba recommended

Nisssan to Asahi Beer Co., Honda to Kirin Beer Co., Mazda to Sapporo

Beer Co., and Toyota to Ebisu Beer Co.

Just as in the case of Japanese, two instances of functional readings seem possible in one single clause. We can, for example, answer (88a) with (92a), intending that each professor$_1$ recommended each of the two students$_2$ to his or her$_2$ favorite company whose research project he$_1$ has participated in. Similarly, (92b) can be taken to mean that each of the two computer companies$_1$ recommended each Japanese automobile company$_2$ to a beer company who wishes to use its$_2$ automobile and its$_1$ computer for TV commercials, when we use it to answer (88b).

(92) a. To their favorite company whose research project he has participated in.

    b. To a beer company who wishes to use its automobile and their computer for

       TV commercial.

Confirming yet another generalization that follows from the thesis that pair-list readings must be due to MINOR while functional readings need not, we have thus obtained further evidence in support of the very thesis.

5.4. Implications on the current debate regarding the status of pair-list readings

Pair-list and functional readings are extensively discussed in the literature, and the status of functional readings is uncontroversial while that of pair-list readings is not. The aim of this section is to consider the current debate regarding the status of pair-list readings in the light of the preceding discussion.

There seems to be consensus in the field as to how functional readings ought to be analyzed. The standard analysis assumes that the trace of *wh*-word is a function variable

that is bound by the *wh*-operator. According to the analysis, (93), for example, is roughly interpreted to be (94b) when it is answered by (94a).

(93)   Who does every Englishman love?

(94) a. His mother.

  b. Which function f (from the set of Englishmen to the set of persons) is such that every Englishman x loves f(x)?

Regarding the status of pair-list readings, on the other hand, proposed analyses are classified into two types. The one group, exemplified by Engdahl 1986 and Chierchia 1993, treats pair-list readings as instances of functional readings (henceforth the functional analysis). The other, exemplified by Groenendijk & Stokhof 1984, May 1985, Higginbotham 1991, and Szabolcsi 1997a, among others, assumes that a pair-list reading emerges through the quantifying-in of a QP to a given *wh*-question (hereafter the quantifying-in analysis). With this approach, (93), for example, is interpreted to be (95), where the trace of the wh-word is a 'regular' individual variable, as opposed to a function variable.

(95)   For each x, x is an Englishman, which y, y is a person such that x loves y.

These analyses crucially differ from each other in that the functional analysis assumes that the *wh*-word takes scope above the QP while the quantifying-in analysis maintains the opposite. Since it is likely that the proponents of these analyses assume that all instances of scope interaction are based on LF compositional computation (the assumption rejected in the previous chapters), the following paraphrase is appropriate. The functional analysis attributes the availability of pair-list readings for ρ to the LF in

(96a), but the quantifying-in analysis associates it to the LF in (96b), where ρ is a *wh*-question whose configuration is [… QP [… WH …]] prior to A'-movement.[17]

(96)   a. [QP$_1$ [WH$_2$ [… t$_1$ [… t$_2$ …]]]]

    b. [WH$_2$ [QP$_1$ [… t$_1$ [… t$_2$ …]]]]

Given the conclusion in the previous sections that pair-list reading emerges due to MINOR by which the QP takes wide scope with respect to the *wh*-word, the functional analysis must be rejected. We also cannot maintain the quantifying-in analysis because when the *wh*-question under discussion gives rise to a pair-list reading, both of the QP and the *wh*-word must be in an A-position. (Recall that two elements scopally interact due to MINOR only if both of them must be in an A-position.) In other words, we are led to conclude that the *wh*-question must be represented as (97) at LF for pair-list readings, and this entails that even *wh*-words that undergo overt A'-movement may be found in an A-position at LF.

(97)   [… QP [… WH …]], where both the QP and the *wh*-word are A-positions.

In retrospect, the debate regarding the status of pair-list readings is interesting. Historically, the analysis of functional readings was not controversial, and the field has attempted to answer the question of whether or not pair-list readings can be deduced to functional readings. It turns out, however, that this very question is misguiding since the cognitive domain relevant for pair-list readings may not correspond to the domain that concerns functional readings.

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[17]   Mary (1985) is an exception to this interpretation; he stipulates a notion called *Σ-sequence* that allows the LF representation in (96b) map to (95).

5.5. Summary and further remarks

In this chapter, I have argued that functional readings may be through LF compositional computation while pair-list readings must be due to MINOR, an extragrammatical operation, thereby further confirming the thesis defended in the previous chapters that there are two sources of scope interaction. It is also pointed out that the question of whether or not pair-list readings are instances of functional readings (for which the field is eager to provide an answer) is misguiding since the cognitive domain relevant for pair-list readings may not correspond to the domain that concerns functional readings.

Functional readings due to MINOR are left unmentioned above (except FN9); however, such instances can be easily demonstrated. According to the literature such as Engdahl 1986, functional readings are possible for *wh*-questions whose configuration is [… QP [… WH …]], prior to A'-movement, but not for *wh*-questions whose configuration is [… WH [… QP …]], prior to A'-movement. Supposedly, therefore, (98a) can be answered by (99) while (98b) cannot, intending *he or she* to 'be bound by' *every student*. However, the judgments are not so clear, and many speakers in fact find functional readings available in both examples (although (98a) allows the reading more readily than (98b)).

(98)   a. Tell me who every student recommend?

       b. Tell me who recommended every student?

(99)   A professor he or she likes.

What is of interest is that the functional reading obtained in (98b) seems to be due to MINOR since it disappears if one of the necessary conditions for MINOR fails to be

met. For example, we cannot use (99) to answer (100), where we can reasonably assume that the QP is not taken as referring to a specific group.

(100)   Tell me who recommend at least one student each year?

Finally, pair-list readings are extensively utilized for the investigation of the LF properties. This work, however, indicates that the investigation of pair-list readings does not reveal LF structural properties, and suggests that theoretical claims made based on the (un)availability of pair-list readings be revaluated. Functional readings, on the other hands, remain to be useful tools for the study of LF properties, if researchers distinguish those that are through LF compositional computation from those that are due to MINOR.

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Appendix

On Some Current Proposals

A.1. Introduction

In the forgoing chapters, I have maintained that there are two sources of scope interaction. The wide scope reading of a QP α over a QP β (henceforth WSR<α, β>) may obtain (i) through LF compositional computation or (ii) due to MINOR, an extra-grammatical operation. Since the recognition of more than one scope-taking strategies is not uncommon in the recent tradition, one may wonder how the claims pursued in the previous chapters differ from those in other works. In this appendix, I will briefly review two of such works, namely Beghelli & Stowell (= B&S) 1997, and Reinhart 1997.

A.2 Remarks on Beghelli & Stowell 1997

B&S (1997) assume, on one hand, that all instances of wide scope readings are generated through LF compositional computation, and at the same time (i) create a system that is radically different from the standard system, and (ii) maintain that there are two distinguished bases for wide scope readings. My interest here is to evaluate if it is necessary to assume the dichotomy they put forth.

B&S (1997) claim that the grammatical basis of WSR<α, β>, where α is either *every NP* or *each NP* and β is a QP of any type, must be distinguished from that of WSR<α, β>, where α is a QP that is not *every NP* or *each NP* and β is a QP of any type. According to their claim, WSR<QP_{Sub}, QP_{Obj}> in (1a)-(1c) must be distinguished from

WSR<QP$_{Sub}$, QP$_{Obj}$> in (1d)-(1e), where QP$_{Sub}$ stands for a subject QP, and QP$_{Obj}$ for an object QP.

(1)   (= B&S 1997 (19))

   a. Tom, Dick, and Hary read two books about India.

   b. Three boys read two books about India.

   c. All the boys read two books about India.

   d. Every boy read two books about India.

   e. Each boy read two books about India.

To explain how they reach this conclusion, I must first introduce some of their fundamental assumptions, which are rather different from those in the standard approach. Under the standard approach, a given QP α has a quantificational interpretation (i.e., is of <et, t>); thus its ability to be distributed (= distributivity) is inherent in α. QR is optional, but a QP that is not the sister of an element that denotes a one-place predicate cannot be interpreted unless it undergoes QR. B&S (1997), on the other hand, adopt the assumptions in (2).

(2)   a. No QP inherently possesses distributivity; all QPs are interpreted as some kind
         of 'group', cf. B&S 1997: Section 2.7, p.85.

      b. QR is strictly feature-driven; each QP bears a feature depending on what type it
         is, and moves to the spec of a projection to check off its feature, B&S
         1997:Section 2.4, pp.77-78.

Besides [+ wh], [+ AgrS], and [+ AgrO], among the features that they claim to exist are, [+ dist$_{(ributive)}$], [+ Ref$_{(erential)}$], and [+ Share], and these features are checked off at

the specs of DistP, RefP, and ShareP respectively. The QP types listed in (3) are among the classifications they assume, cf. B&S, pp.73-77.

(3)   a. Distributive-Universal QPs

"These are QPs headed by *every* or *each*, which occur only with singular nouns," and they may carry [+ dist].

b. Group-Denoting QPs

These include "indefinite QPs headed by *a, some, several*, bare-numeral QPs like *one student*, *three students*, … , and definite QPs like *the students*," and they may carry [+ Ref] or [+ Share], but not [+ dist].

c. Counting QPs

"These include decreasing QPs with determiners like *few, fewer than five, at most six*, and generally cardinality expressions built by modified numerals (e.g., *more than five, between six and nine, more (students) than (teachers), …*), and they cannot carry [+ dist], [+ Ref], or [+ Share].

To motivate the two distinguished bases for wide scope readings noted above, they further adopt the following assumptions.

(4)   a. A QP receives distributivity at the spec of the DistP, but not at the spec of a functional projection other than the DisP, cf. B&S 1997, pp.91-92.

b. A QP in the spec of a projection other than the DistP must make use of an independent covert distributor in order to take wide scope with respect to another element, cf. B&S 1997, p.94.

Every NP and *each NP* carry the [+ dist] feature; hence, they receive distributivity from the DistP. The other types of QPs, on the other hand, must utilize an independent covet

distributor to give rise to wide scope readings. Hence, wide scope readings involving *every NP* or *each NP* must be distinguished from those with the other types of QPs.

In what follows, I do not evaluate the validity of the assumptions in (2) and (3) since such a task necessarily involves the evaluation of works other than the work under review, such as Beghelli (1995) and Szabolzci (1997b), which presumably establish these assumptions. I will instead assume for the sake of discussion that each of these assumptions is motivated independently, and focus on the arguments B&S provide in support of the assumptions in (4).

In support of the assumptions in (4), they provide three kinds of arguments. First, they argue, based on the contrast in (5), that the distributiviy associated with *every NP* or *each NP* is different from that accompanied by the other types of QPs.

(5)   (= B&S 1997 (17))

    a. All the boys surrounded the fort.

    b. ?Every boy surrounded the fort.

    c. ?Each boy surrounded the fort.

Second, they observe that (6d)-(6e) allow the reading where each boy read a book that no body except him or her read, but (6a)-(6c) does not, and the reading that (6a)-(6c) allow is only that some other book mentioned previously in the discourse is read by the people the subject QP refers to, and they conclude once again that the distributiviy associated with *every NP* or *each NP* is different from that accompanied by the other types of QPs.

(6)   (= B&S 1997 (20), slightly adapted)

    a. The boys read a different book.

b. Five boys read a different book.

c. All the boys read a different book.

d. Every boy read a different book.

e. Each (of the) boy(s) read a different book.

Third, they put forth the generalization that WSR<QP_{Obj}, QP_{Sub}> obtains in the basic order only if the QP_{Obj} is either *every NP* or *each NP*. They, for example, claim that (7d)-(7e) give rise to WSR<QP_{Obj}, QP_{Sub}>, but not (7a)-(7c).

(7)   (Based on B&S 1997 (21))

a. A boy read Ulysses and Dubliners.

b. A boy read two books.

c. A boy read all the books.

d. A boy read every book.

e. A boy read each book.

They argue that this generalization can be accounted for once we recognize the two grammatical bases for wide scope readings sketched above, together with the assumption that the DistP, other functional projections, and a covert distributor are represented at LF in a certain way.

I would like to point our, however, that none of their arguments is conclusive. First, the fact regarding (5) that *every NP* and *each NP* cannot have non-distributive construal while the other types of QPs can does not preclude the possibility that the latter possess the same distributivity that *every NP* and *each NP* have.

Second, the alleged contrast with *a different N* in (6) does not justify us to postulate the different types of distributivity. Recall that not only *every NP* and *each NP*, but

also the other types of QPs, can give rise to wide scope readings (e.g., (1)). Precisely for that reason, they make a stipulation that the other types of QPs make use of an independent covert distributor. Once the covert distributor is introduced, the other types of QPs can be semantically on a par with *every NP* and *each NP* in terms of their distributability over *a different N*, unless additional statements are made to differentiate them. This makes us doubt their factual evaluation regarding (6). If the reported judgments regarding (6) are correct, on the other hand, we are led to assume that a QP that is not *every NP* or *each NP* can never take wide scope with respect to another QP. Either way, we are yet to see the evidence that there are two distinguished grammatical bases for wide scope readings.

Finally, I disagree with the generalization on which they base the third argument. We have observed in Chapter 2 that WSR<QP_{Obj}, QP_{Sub}> may obtain in the basic order even when the QP_{Obj} is not *every NP* or *each NP* as long as the speaker can refer to a specific group with it. Furthermore, the observation in Chapter 2 that when WSR<QP_{Obj}, QP_{Sub}> can obtain in the basic order, the interpretive restriction is imposed on the clause-mates of the QP_{Obj}, whether or not the QP_{Obj} is *every NP*, *each NP*, or a QP of another type, suggest that WSR<QP_{Obj}, QP_{Sub}> where the QP_{Obj} is *every NP* or *each NP* should not be differentiated from WSR<QP_{Obj}, QP_{Sub}> where the QP_{Obj} is a QP of another type.

Hence, I conclude that it is not necessary to subdivide wide scope readings through LF compositional computation in the way B&S do.

A. 3. Remarks on Reinhart 1997

Renihart (1997) adopts the standard analysis that WSR<α, β>, where α and β are

QPs, obtains through the compositional computation applied to the LF in (8).

(8)   [$_\Psi$ α [$_\Psi$ β [$_\Psi$ … t_α/t_β [… t_β/t_α …]]]], where Ψ stands for an element that

    denotes a one-place predicate.

She, however, assumes an additional scope-taking strategy known as *the choice function*

strategy, which allows indefinites to take independent scope (but not wide scope) with

respect to another scope-bearing element.

In Sections A.3.1, I briefly summarize the choice function analysis Reinhart pro-

poses, as well as the empirical materials that motivate it. Section A.3.2 spells out how

the choice function strategy differs from MINOR, an extra-grammatical operation, pro-

posed in the foregoing chapters. I then suggest in Section A.3.3 that the empirical mate-

rials that motivate the choice function analysis are better captured by MINOR, and the

choice function strategy needs not be assumed.

A.3.1. The choice function analysis

To review how Reinhart (1997) puts forth the choice function analysis, let us first

consider (9).

(9)   a. (= Reinhart 1997 (51a), p.364)

        If we invite two philosophers, Max will be offended.

        b. (= Reinhart 1997 (62), p.367, which is cited from Ruys 1995)

        If three relatives of mine die, I will inherit a house.

We can truthfully utter (9a) in the situation where Max gets offended only if two specific

philosophers are invited, and the invitation of two philosophers may not be sufficient to

make Max mad. Similarly, (9b) can be true in the situation where the death of three relatives of the speaker may not get him or her a house. On the basis of this, Reinhart concludes (10).

(10)   Indefinites can take scope over an island.

One possible counterargument for (10) comes from Fodor & Sag (1982) who assume that an indefinite can be analyzed as either a quantificational element or a referential expression. Given their assumption, the observation regarding (9) above straightforwardly follows. Expecting such a counterargument, Reinhart puts forth examples like the following:

(11)   (= Reinhart 1997 (68a), p.374)

Most linguists have looked at every analysis that solves some problem.

Reinhart points out that (11) can be true in the situation where most of the linguists in a given context have each investigated one specific problem and looked at every analysis that solves it. She goes on to say that the availability of such an interpretation is not expected under the Fodor & Sag analysis since what the analysis gives us is only (i) the reading where most of the linguist investigated the same one problem or (ii) the reading where they have looked at every analysis that solves a problem, and each of them has possibly investigated more than one problems. Maintaining (10), she takes the interpretation of (11) under discussion as evidence that *some problem* takes intermediate scope between *most linguists* and *every analysis*.

A question is how to account for (10). She considers two possible approaches one might pursue and demonstrates that both fall short. One approach is to assume QR to be insensitive to island constraints at the expense of giving up the parallelism between overt

and covert movement (henceforth the QR approach). Reinhart argues that such an approach fails to generate the reading we need to account for, but generates an unattested reading. She, for example, points out that under this approach (9b) is represented as (12a) at LF, where *three relatives of mine* is moved out of the island, and the reading in (12b), an unavailable reading for (9b), is expected to be available. (12b) would mean that there are three relatives such that for each of them, I will inherit a house if she or he dies. Furthermore, the reading that (9b) has, namely, the one that the speaker gets a house only if three specific relatives of his or her die, cannot be accounted for.

(12)   (= Reinhart 1997 (63), p.367)

    a. [three relatives of mine]$_i$ [if e$_i$ die, I will inherit a house]

    b. $\exists$ three x (relative of mine (x) & (x dies $\rightarrow$ I inherit a house))

Reinhart's remarks on the QR approach are summarized as follows. In order to generate the 'specific-relative reading' for (9b), the operator, i.e., *three*, must scope out of an island while its distributor stays within the island. But such an option is not available under the QR approach, since this approach does not allow an operator to be separated from its distributor.

    The other approach she considers is to apply unselective binding, originally proposed in Heim 1982 independently of the issue that concerns Reinhart (1997), to island contexts (henceforth the unselective-binding approach). This line of thinking is actually executed in Beghelli 1993. In this approach, a QP is a restricted variable or set variable, and is bound by a higher existential quantifier that is inserted at LF; (9a), for example, is represented as (13) at LF.

(13)   (= Reinhart 1997 (51b), p.364)

$\exists Y((|Y|=2 \ \& \ Y = \{x \mid philosopher \ (x) \ \& \ we \ invite \ x\}) \rightarrow (Max \ will \ be$

offended))

This approach does not face the problem of the QR approach. Note that the operator $\exists$

in (13) is outside the island, but the relevant distribution is done within. Reinhart points

out, however, that this approach faces a serious semantic problem. She states on p.364

as follows: "[A]ll that [(13)] says is that there is some set, such that if it has two mem-

bers who are philosophers that we invite, Max will be offended. There are many sets

that meet this requirement (not only non-philosopher sets, but also the null set). So the

sentence ends up a necessary truth." According to her, the problem of this approach lies

in that the restrictor of a QP must stay within an island.

So how can we account for (10)? Reinhart proposes as a solution the choice func-

tion analysis, which is a modification of the unselective binding approach. In this analy-

sis, a QP is a choice function variable rather than a restricted variable or set variable, and

it is bound by a higher existential quantifier, just as in the unselective binding approach.

Three relatives of mine in (9b), for example, is analyzed as a choice function that selects

one set from sets of three relatives of the speaker, and the sentence as a whole is repre-

sented as (14).

(14)   (= Reinhart 1997 (81b), p.382)

$\exists f \ (CH \ (f) \wedge (f \ (three \ relatives \ of \ mine) \ die \rightarrow I \ inherit \ a \ house))$

The problem the QR approach faces does not concern this analysis just in the same way

that it is not a problem for the unselective-binding approach. Regarding this, Reinhart

makes the following remark on p.382. "The indefinite is interpreted in situ. … Thus, in

[(14)] there is no new predicate formed at the covert structure. The only predicate which takes a set argument is *die*, hence it is only this predicate that can distribute. So we derive only the interpretation the sentence indeed has: that there is a set of relatives, such that if each one of them dies, I inherit a house." It is also the case that the choice function analysis does not face the problem of the unselective binding approach. As noted above, *three relatives of mine* in (9b), for example, is analyzed as a choice function that selects one set from sets of three relatives of the speaker; crucially, the function ranges over only the speaker's relatives. In this approach, therefore, restrictors are not considered as a part of an LF; hence they need not stay within an island.

A.3.2. Differences between the choice function analysis and MINOR

The choice function differs from MINOR, an extra-grammatical operation, proposed in the forgoing chapters; for the choice function strategy, allowing the insertion of existential closure at LF, makes use of LF compositional computation to derive a given scope interpretation, but MINOR makes reference to a representation other than an LF.

We can also empirically differentiate the two. While MINOR is meant to capture certain kinds of wide scope readings, the choice function strategy does not generate wide scope readings; the latter allows a QP to take independent scope, but not wide scope, with respect to another scope-bearing element. Take (15a) as an example. Under the choice function analysis, (15a) is represented as (15b) if *two professors* is interpreted as a choice function variable, and *ten student* as a quantificational element, or as (15c) if both of them are interpreted as choice function variables.

(15)   a. Ten students greeted two professors.

       b. $\exists f\ (CH\ (f) \land (\exists 10\ x\ (student\ (x) \land (x\ greeted\ f\ (two\ professors)))))$

    c. $\exists f_2\ \exists f_1$ (CH (f_1) $\wedge$ CH (f_2) $\wedge$ (f_1 (ten students) greeted f_2 (two professors)))

Notice that neither (15b) nor (15c) express the reading in (16a) in which *two professors* takes wide scope with respect to *ten students*. (15b) and (15c) only express the readings in (16b) and (16c) respectively.

(16) a. There are two professors such that each of them has ten students who greeted him or her.

     b. There are two professors such that there are ten students who greeted them.

     c. There are two professors and ten students such that they greeted them.

It is therefore obvious that we must assume MINOR even if we adopt the choice function strategy. Now the question is whether or not we must assume the choice function analysis in addition to MINOR.

A.3.3. Do we really need the choice function strategy?

To determine if it is necessary to assume the choice function analysis in addition to MINOR, we must consider whether or not MINOR can account for the empirical materials that motivate the choice function analysis. In other words, we must see if MINOR can bring about the specific philosophers/relatives reading in (9) and the intermediate-scope reading in (11). (9) and (11) are repeated here for convenience.

(9)   a. (= Reinhart 1997 (51a), p.364)

       If we invite two philosophers, Max will be offended.

     b. (= Reinhart 1997 (62), p.367, which is cited from Ruys 1995)

       If three relatives of mine die, I will inherit a house.

(11)   (= Reinhart 1997 (68a), p.374)

       Most linguists have looked at every analysis that solves some problem.

In Chapter 3, we came to understand a number of properties associated with MINOR. Some of them are listed in (17).

(17) a. (= Chapter 3 (53))

MINOR includes the substantiation of a specific group that is 'compatible with' the denotation of a QP.

b. (= Chapter 3 (55))

MINOR operates on a domain consisting of A_1, A_2, ... A_n, where A_1, A_2, ... A_n are major constituents of the same clause.

c. (= Chapter 3 (56))

MINOR is an operation that makes one element to bear clausal scope, and is allowed only once per its domain.

Partly based on the properties in (17), I have speculated that MINOR is an operation that applies to a domain consisting of A_1, A_2, ... A_n, where A_1, A_2, ... A_n are major constituents of the same clause, and create a mental representation where a specific group, which is 'grabbed' from some cognitive domain other than the lexicon of a given language on the basis of the lexical information of an NP/a QP in the domain of the operation, is associated with one place predicate, which is formed on the basis of the lexical information of the rest of the elements in the domain. I have speculated that the wide scope reading of *three professors* over *more than two students* in (18) is, for example, due to the representation in (19).

(18)   (= Chapter 3 (58))

(Context: You investigate how many students visited Prof. A, Prof. B, and Prof. C, and report the result.)

More than two students visited three professors.

(19)   (= Chapter 3 (59))

{a, b, c} --- λx ∃y (*visited* (x, y) ∧ *more-than-two* (y) ∧ *student* (y))

To make the following discussion concrete, I assume below that MINOR is the operation I have just sketched, and consider if MINOR can give rise to the readings in (9) and (11) under discussion. First, the specific relative reading in (9b) can emerge if MINOR applies to the conditional clause. When (9b) is uttered, for example, in the situation where the speaker talked about the three relatives of her, John, Bill, and Tom, the conditional clause can be interpreted due to MINOR, i.e., due to the representation in (20).

(20)   {j, b, t} --- λx (*die* (x))

Note that (20) gives us the reading under discussion, i.e., in order for the speaker to inherit a house, John and Bill and Tom must die, and the death of three relatives of the speaker may not get him or her a house. Incidentally, this analysis does not face the problem that the QR approach fails to overcome (see Section A.3.1) since MINOR takes place within the antecedent clause, and thus the relevant distribution is executed locally. Furthermore, the problem that the unselective-binding approach faces (see Section A.3.1) is not a problem to this approach, just as it is not to the choice function analysis, i.e., the restrictor is not a part of the representation in (20).

This analysis receives support from the following empirical materials. First, it seems that a given QP α does not appear to take scope over an island if the speaker does not refer to a specific group with α. For instance, unlike (9b), the examples in (21) do not give rise to the specific relative reading. This contrast is expected from (17a), one of the properties associated with MINOR.

(21)   If three or more relatives of mine die, I will inherit a house.

         If 25% or more of my relatives die, I will inherit a house.

Second, it seems that in a given clause only one indefinite can appear to take scope over an island, as illustrated in (22), and this generalization also follows from (17c), one of the properties associated with MINOR.

(22)   a. If three boys approached two girls, John will be mad.

       b. If many professors recommended some student, John will be mad.

Let me explain the point in detail, using (22a). Suppose that Paul, Bill, and Ken each approached two girls. In this situation, (22a) does not necessary entail that John is mad if the boys that the speaker has in mind are, for example, Tom, Paul, and Tim. Now suppose that Tom, Paul, and Tim are the boys the speaker has in mind, and each of them approached two girls. In this situation, (22a) seems to entail that John is mad, indicating that only one indefinite can 'take scope over' an island. We can also illustrate the same point from a different perspective. Suppose that Mary and Sue are each approached by three boys. In this situation, (22a) does not necessary entail that John is mad if the girls that the speaker has in mind are, for example, Sue and Kathy. Now suppose that the girls that the speaker has in mind is Sue and Kathy, and each of them was approached by three boys. In this situation, (22a) entails that John is mad, pointing to the same conclusion.

Let us now turn to the intermediate scope reading in (11). How precisely MINOR can give rise to the reading under discussion is not straightforward. I wish to speculate that the reading emerges when two instances of MINOR occur; one applies to the relative clause, and the other to the matrix clause. To illustrate the proposal more con-

cretely, consider the scenario that the speaker utters (11) to describe the situation where the linguists under discussion are A, B, C, D, E, and F, and A, B, C, and D are interested in solving Problems 1, 2, 3, and 4, respectively. First, one instance of MINOR applies to the matrix clause, and the representation in (23) is constructed.

(23)   {a, b, c, d} --- λx ∃y (*look-at* (x, y) ∧ N (y) ∧ *analysis-that-solves-some-*

         problem (y)), where N = the total number of analyses that solve a given

         problem

Then, another instance of MINOR takes place, as (23) is unpacked with regard to each of the linguists, as illustrated in (24).

(24)   ∃y (*look-at* (a, y) ∧ N (y) ∧ [{1} --- λz (y solves z)]) ∧

         ∃y (*look-at* (b, y) ∧ N (y) ∧ [{2} --- λz (y solves z)]) ∧

         ∃y (*look-at* (c, y) ∧ N (y) ∧ [{3} --- λz (y solves z)]) ∧

         ∃y (*look-at* (d, y) ∧ N (y) ∧ [{4} --- λz (y solves z)]), where N = a total number

         of analyses that solve a given problem

     The following discussion supports this line of thinking, i.e., the 'intermediate scope' reading involves two instances of MINOR. First, the reading does not obtain if the speaker does not refer to a specific group with the matrix subject; it is difficult to take the examples in (25), for instance, as giving rise to the 'intermediate scope' reading. This observation follows, once we assume that the reading under discussion involves MINOR applying to the matrix clause.

(25)   a. If more than 40% of the linguists look at every analysis that solves some

         problem, the field will advance greatly.

b. If 10 or more linguists look at every analysis that solves some problem, the field will advance greatly.

Second, it seems also be the case that the 'intermediate scope' reading obtains only when MINOR takes place in the relative clause. For example, the reading under discussion does not obtain if a given indefinite in the relative clause cannot be understood as referring to a specific group, as illustrated in (26).

(26) a. Most linguists looked at every analysis that solves 50% or more of the problems.

b. Most linguists looked at every analysis that solves more than 3 problems.

Furthermore, only one indefinite in the relative clause can appear to take intermediate scope, as illustrated in (27).

(27) a. Most linguists greeted every professor that recommended some scholar for some position.

b. Most linguists approached every professor that introduced three publishers to some scholar.

To sum up so far, we have not only acknowledged that the MINOR analysis seems to be able to capture the empirical materials that motivate the choice function analysis, but also identified two generalizations that immediately follow from the properties of MINOR. The two generalizations are summarized in (28) for convenience.

(28) a. A given indefinite α can appear to take scope over an island only if the speaker refer to a specific group with α.

b. Of a given clause, only one major constituent can appear to take scope over an island.

Given that MINOR seems able to capture the empirical materials that motivate the choice function analysis, the latter seems to be superfluous. Furthermore, to maintain the choice function analysis, it is necessary to establish the generalizations in (28) on an independent ground. In fact, noticing contrasts analogous to the ones between (9b) and (21) and between (11) and (26), Reinhart qualifies the generalization in (10), saying that only a subset of indefinites can scope out of an island, i.e., be analyzed as choice function variables. She puts forth the following classifications of indefinites, and attempts to motivate them independently, cf. Reinhart 1997, pp.383-384.

(29) a. Items that cannot scope out of an island

less than three NP, more then three NP, exactly three NP, at least three NP,

three or more NP, between three and five NP, etc.

b. Items that can scope out of an island

an NP, some NP, three NP, many NP, which NP, etc.

Even if the generalizations in (28) are established on an independent ground, however, the choice function analysis fails to account for the contrast between (11) and (25) regarding the (un)availability of the 'intermediate scope' reading. Under the choice function analysis, the 'intermediate scope' reading in (11) emerges when (11) is analyzed as (30a), and nothing prevents us from analyzing, for example, (25a) as (30b) to generate the reading under discussion.

(30) a. (= Reinhart 1997 (68c), p. 357)

For most linguists x, $\exists f$ (CH (f) $\wedge \forall y$ ((analysis (y) $\wedge$ y solves f (problem)) $\rightarrow$ x

looked at y))

b. For 40% or more of the linguists x, $\exists f$ (CH (f) $\wedge \forall y$ ((analysis (y) $\wedge$ y solves

f (problem)) $\rightarrow$ x looked at y))

On the basis of the above discussion, therefore, I would like to reject the choice function analysis altogether. To the extent that the analysis I have developed using MINOR is on the right track, it turns out that the generalization that indefinites take scope over an island is incorrect.