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<α, β> 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 between 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 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. 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)

Every logician was walking with a boy near that logician'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. Every logician was walking with a boy near his house.

c. (= Ueyama 1998 (71a), p.157, slightly adapted)

Which logician was walking with a boy near that logician's house?

d. Which logician was walking with a boy near his house?

(25) a. (= Ueyama 1998 (72a), p.157, slightly adapted)

*Even this logician was walking with a boy near that logician's house.

b. Even this logician was walking with a boy near his house.

(26) (= Ueyama 1998 (15) and (17), pp.128-129, slightly adapted)

a. Dono zidoosya gaisya-ga soko-no kogaisya-o suisensita
which automobile company-NOM that:place-GEN subsidiary-ACC recommended

no ?
COMP

'Which automobile company recommended its subsidiary?'

b. Dono zidoosya gaisya-ga sono zidoosya gaisya-no kogaisya-o
which automobile company-NOM that automobile company-GEN subsidiary-ACC

suisensita no ?
recommended COMP

'Which automobile company recommended that automobile company's subsidiary?'

(27) (= Ueyama 1998 (14) and (16), pp.128-9, slightly adapted)

a. Toyota-sae-ga soko-no kogaisya-o suisensita.
Toyota-even-NOM that:place-GEN subsidiary-ACC recommended

'Even Toyota recommended its subsidiary.'

b. *?Toyota-sae-ga sono zidoosya gaisya-no kogaisya-o suisensita.
Toyota-even-NOM that automobile company-GEN subsidiary-ACC recommended

'Even Toyota recommended that automobile company'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. ?Which student did his/that student's professor recommend for a lucrative project?

b. ?Which one of these boys did his wife divorce?

(29) (Based on Ueyama 1998 (37)-(38), p.136-137)

a. Kyonen Toyota-ga dono zidoosya gaisya-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-*m*o '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 which automobile company last year] caused it / that automobile company to go bankrupt?'

b. Kyonen dono zidoosya gaisya-ga Toyota-o uttaeta toyuu riyuu-de,
last:year which automobile company-NOM Toyota-ACC sued COMP reason-with

John-ga soko / sono zidoosya gaisya-o tyoosasiteiru no ?
John-NOM that:place that automobile company-ACC is:investigating COMP

'(Lit.) [For the reason that which automobile company sued Toyota last year], is John investigating it / that automobile company?'

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 that linguist did every linguist insist that John had demanded?

b. ?*A special evaluation of that linguist, every linguist insisted that John had demanded.

c. Which evaluation of him did every linguist insist that John had demanded?

d. A special evaluation of him, every linguist insisted that John had demanded.

(31) (= Ueyama 1998 (57)-(58), pp.149-150, slightly adapted)

a *Sono zidoosya gaisya-no kogaisya-o dono zidoosya gaisya-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.'

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[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. Soko-no seihin-o Toyota-ga doko-ni okurikaesita ka osiete
that:place-GEN product-ACC Toyota-NOM where-DAT returned Q teach

kudasai.
please

'Please tell me to whom Toyota returned its 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) Soko-no seihin-o subete-no kaisya-ga doko-ni okurikaesita ka
that:place-GEN product-ACC all-GEN company-NOM where-DAT returned Q

osiete kudasai.
teach please

'Please tell me to whom every company returned its product.'

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[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 doko-ni soko-no seihin-o okurikaesita ka osiete kudasai.
all-GEN company-NOM where-DAT that:place-GEN product-ACC returned Q teach please
'Please tell me to whom every company returned its product.'

On the other hand, the question in (34) can be replied with the functional answer in (35) with the interpretation that every company$_1$ returned its$_2$ product to a company$_2$ that it$_1$ 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. Soitu-no ronbun-o rei-no hutatu-no kaisya-ga dare-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 who the two companies made present his or her 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 particular, 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.

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[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 felicitous for (47a). However, the scope range of the negation in (46a) and (47b) differs depending 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 reason. 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 replied 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 counterparts 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 denoted 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 constructions, 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), respectively.

(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 example, with (66a) where the value of *soko* 'it' depends on the individuals denoted by *subete-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 hutatu-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 $A_1, A_2, \ldots A_n$, and $A_1, A_2, \ldots A_n$ 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 between 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), intending that each of Abe law office and Bekkyo law office$_1$ made each of the two students$_2$ 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 extra-grammatical 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.