

Quantifier Interaction in GB and Minimalism (II)

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Chapter 3 The Minimalist Approach

3.1. Logical Form in the Minimalist Programme

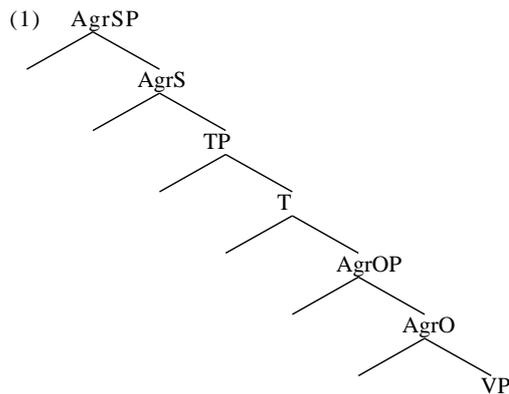
In this chapter the Minimalist programme which is proposed in Chomsky (1993) is examined according to Hornstein (1995) where the assumptions underlying the programme are surveyed and LF phenomena are discussed.

We have seen in chapter 1 that various levels of grammatical representation are postulated in GB theory, DS, SS, PF, and LF. In Minimalist Programme it is only the two levels, PF and LF, which interface with other systems of module of language, the Perceptual-Articulatory (PA) system and Conceptual-Intentional (CI) system respectively. PF-representations are derived by PF operations and LF-representations by LF operations, after Spellout, the point at which overt syntactic structures are derived and the derivation splits, and then are input to PA system and CI system respectively. Accordingly, any effect of well-formed condition in GB theory is to meet on output representations at these two levels. Specifically, effects of the theta criterion, locality conditions on overt movement, case theory, and the binding theory are all required to meet at LF.¹

This elimination of DS and SS in Minimalism is closely related with reformulation of movement. LF representations are derived via successive application of movement operations; overt movement before Spellout and covert movement after Spellout. In Minimalist Programme movement is assumed to be triggered only by morphological requirement: all morphological features must be checked in the appropriate functional projections in the course of derivation to meet the principle of full interpretation (PFI), strong features at Spellout, weak features after spell out. The PFI requires that all features which do not directly concern to interpretations at PA system/CI system must have been checked and charged off at LF/PF. This suggests elimination of A -movement which is characteristic of LF operations in GB, QR and WH-raising, on the reason that such adjunction operations are not morphologically driven with no specific landing site except that it can adjoin to any maximal projection as in May (1985). On the other hand, A -movement in the syntax, WH-movement, is licensed: firstly it is morphologically driven to move to Spec CP, although it is an A -position, to have its Q-features checked, and secondly it can be treated as a substitution operation rather than adjunction

¹ In GB theories the theta criterion is applied at DS, locality at SS, case theory at SS, and the binding theory at SS and LF.

operation suggesting that core syntactic operations do not rely on adjunction. Alternatively, in Minimalist approach scope phenomena are reanalysed in terms of A-movement. In Minimalist approach QPs and NPs are not differentiated, and both of them are assumed to be generated within VP shell, and then move out to Spec Agr positions for case-checking purpose, subjects to Spec AgrS and objects to Spec AgrO, forming A-chains which contain a moved NP and a copy of it. This can be depicted as in (1):



Importantly, to be interpreted at the CI interface, all member but one in an A-chain must be deleted according to the PFI. This deletion operation does not obey the sort of Preference Principle, but can be assumed to be subject to Mapping Principle (Diesing (1992)) where definite (d-linked/presupposed) NPs are required to be outside the VP shell. With these assumptions, relative quantifier scope is directly reflected at LF, and identified as is stated in (1) (Hornstein (1995, p. 154)):

- (2) A quantified argument Q_1 takes scope over a quantified argument Q_2 iff Q_1 c-commands Q_2 (and Q_2 does not c-command Q_1).

On the other hand, in A -chains formed by A -movement, WH-movement, the Preference Principle is applied (Chomsky (1993)), which suggests to delete, all things being equal, contentful expressions from A -position. In Hornstein (1995) this effect is interpreted as follows: it is a preference for interpreting a contentful expression in A-positions. That is, since QPs exercise their semantic power from A-positions, so do WHs like other QPs by reconstructing to A-positions at LF.²

² There is one more instantiation of chains which is assumed in Minimalism, head movement (X^0) chains. However, I do not refer to it here.

Quantifier Scope

Let us see how this approach deals with scope phenomena. (4-1) is the LF-representation after case checking for the ambiguous sentence (3), and (4-2) indicates the deletion possibilities (Hornstein (1995, p. 155)):

- (3) Someone attended every seminar
 (4)- 1. [_{AgrS} Someone [_{TP} Tns [_{AgrO} every seminar [_{VP} someone [_{VP} attend every seminar]]]]]
 (4)- 2a. [_{AgrS} Someone [_{TP} Tns [_{AgrO} every seminar [_{VP} (someone) [_{VP} attend (every seminar)]]]]]
 b. [_{AgrS} Someone [_{TP} Tns [_{AgrO} (every seminar) [_{VP} (someone) [_{VP} attend every seminar]]]]]
 c. [_{AgrS} (Someone) [_{TP} Tns [_{AgrO} (every seminar) [_{VP} someone [_{VP} attend every seminar]]]]]
 d. [_{AgrS} (Someone) [_{TP} Tns [_{AgrO} every seminar [_{VP} someone [_{VP} attend (every seminar)]]]]]

When Diesing's Mapping Principle is applied, (4-4b,c) are not interpretable at the CI interface, since a universal quantifier *every* is a definite, and is required to be outside the VP shell. Thus, only (4-4a,d) are legitimate LF-representations for (3) and are interpreted according to (2): (4-4a) represents the wide scope reading for *someone*, and (4-4d) for *every seminar*. In GB terms (4-2a,d) can be represented in (5a,b) respectively:

- (5) a. [someone_i [every seminar_j [ti attend t_j]]]
 b. [ti [every seminar_j [someone_i attend t_j]]]

This LF structures in (5) are ill-formed within GB theory, since *t_i* is not properly governed in (5a), nor c-commanded in (5b), by its antecedent. Nonetheless, both are legitimate in Minimalism. That is, no such output conditions are needed, but only derivational constraints to form proper chains are required in Minimalism: the most economical step movement must take, all morphological features must be checked etc. We can see that chains are formed being restricted by locality condition in the course of derivation.

This approach also properly correlates pronominal binding with relative quantifier scope. To see this, consider the examples below (ibid. p. 158):

- (6) Someone played every piece of music you know
 (7) Someone_i played every piece of music he_i knew

While (6) is ambiguous, (7) is not with only the wide scope reading for *someone* where there is one musician who played all pieces he knew. The LF structure before deletion for (7) can be represented in (8) (ibid. p. 158):

- (8) [_{AgrS} Someone [_{TP} [_{AgrO} [every piece of music he knew] [_{VP} someone [_{VP} played every piece of music he knew]]]]]

Adopting the Mapping Principle, the *every*-phrase must be outside of the VP-shell. If we

Yoshiko Umemori

delete *someone* in Spec AgrS, it gives the wide scope reading for the *every*-phrase where the pronoun *he* in the *every*-phrase is not bound by *someone* because *someone* does not c-command *he*. This, however, is not the reading indicated in (7). If we delete *someone* in Spec VP instead, we can get the wide scope reading for *someone* which c-commands, therefore can bind, *he* in the *every*-phrase from Spec AgrS.

WH / Quantifier Interactions

In Hornstein (1995) as an analysis for WH/QP interaction in terms of Minimalism, Chierchia (1991) is introduced. Consider next the examples in (9) and (10) (Hornstein (1995, p. 112)):

- (9) What did everyone say
- (10) Who said everything

In the GB style approach of May (1985), subject/object asymmetry concerning WH/QP interactions, appearing in these examples, is explained on the basis of A₀-operation, WH-movement and QR, and ECP, the well-formedness condition for the distribution of empty categories: since the Scope Principle is applied to the LF-representation (11), it gives the sentence (9) two different readings, whereas, for (12) the same QR operation induces an ECP violation, so that *everything* can adjoin only to VP, and thus have only narrow relative scope (ibid. p. 112 for (12)):

- (11) What_t [everyone_i [_t say _{t_i}]]
- (12) Who_i [everything_j [_t said _{t_i}]]

In Chierchia's analysis the interpretive asymmetry between (9) and (10) is explained not in terms of a syntactic scope relation but in terms of WCO structures. Let us consider the examples below (ibid. pp. 112-3)):

- (13)- 1. Who does everyone love
- (13)- 2a. Mary
- b. His mother
- (14)- 1. Who does every linguist admire?
- (14)- 2a. His advisor
- b. Lasnik admires Chomsky, Barss admires Higginbotham and Santorini admires Kroch
- (15)- 1. Who does no linguist admire?
- (15)- 2. His mother

The question (13-1) allows two types of answer, an 'individual' (i-) answer in (13-2a) and a 'functional' (f-) answer in (13-2b), and in the question (14-1) a pair-list answer in (14-2b) is also possible. Importantly, the question (15-1), although it has a functional answer, resists a

pair-list answer. The point here is the opposition between an i-answer and a f-answer, and the lack of the pair-list answer in a question with the f-answer: observing more closely, we note that in f-answer, say in (13-2b), a pronoun *him* maps a person to that person's mother, and the functional answer cannot be considered simply as 'a shorter version' (ibid. p. 113) of a pair-list answer. Generally, the meaning of a question can be identified with the set of true answers for it. Thus, for (13-1), we have (16) (ibid. p. 113):

(16) ?{P: P is true and for some x: P = everyone loves x}

However, this assigns only the i-answer. To obtain the f-answer, the interpretation for a question can be indicated as in (17) (ibid. p. 113):

(17) ?{P: P is true and for some F, P = (every_x (X loves F(X)))}

For this interpretation, the LF phrase marker in (18-1) is obtained, which contains a variable in object position bound by a WH-expression in subject position (cf. ibid. p. 113):³

(18)-1. Who_i [everyone_j [_{t_j} [loves [_{pro_j} _{t_i}]]]]

(18)-2 a. [(Who) [everyone_j [_{t_j} [loves who]]]]

b. [Who [everyone_j [_{t_j} [loves (who)]]]]

'i' is the 'function' (f-)index, and a f-indexed variable is bound by a WH-expression in Comp. 'j' is the 'argument' (a-)index, and an a-indexed variable can act as a pronoun bound by a subject NP to give the functional answer by mapping one individual to another individual. That is, a WH-expression is interpreted as including an implicit pronoun that can be bound by a subject NP.

Then either of the copies in the WH-chain is deleted, prior to interpretation at the CI interface. When the copy in Spec CP is deleted in (18-2a), the question is interpreted as having the functional reading since the implicit pronoun in the object copy is bound by the subject QP *everyone* in its position, requiring the f-answer. On the other hand, when the object copy is deleted in (18-2b), the question is interpreted as having the individual reading since the implicit pronoun in the copy in Spec CP can not be bound by the subject QP *everyone*. Thus, the two readings in (9) are explained by the mechanism mentioned above.

According to this approach, the lack of a pair-list reading in (10) is explained as follows (cf. ibid. p. 114):

(19)-1. Who_i [everything_j [[_{pro_j} _{t_i}], said _{t_j}]]

(19)-2 a. *[(Who) [everything_j [who said _{t_j}]]]

b. [Who [everything_j [(who) said _{t_j}]]]

³ The idea which underlies this line of approach for WH/QP interaction is the fact that a quantifier in subject position can bind an pronoun in object position, but not vice versa.

(19-2a), which should give the functional reading violates WCO since the variable t_j cannot be the antecedent of the pronoun *pro*, to its left. Therefore, only (19-2b) is a legitimate interpretation which gives the individual reading for (10).

Concerning the relation between a functional interpretation and a pair-list interpretation, it is suggested that the former is a necessary but not sufficient condition for the latter. Whether a question has both interpretations or not depends on whether an expression which binds the implicit pronoun contained in a WH-phrase can provide a domain so that each element in it can be related with an element in the range. For example, universal quantifiers are such expressions as to provide a domain, making pair-list readings possible.

3.2. Raising Quantifiers without Quantifier Raising Kitahara (1996)⁴

In Kitahara (1996) the core cases of scopal interactions are explained using a chain-based theory (Aoun & Li (1989, 1991)) together with the theory of feature-checking (Chomsky (1993), Chomsky & Lasnik (1993)).

A Chain-Based Theory of Scope Interpretation

As we have examined the same type of cases so far, the sentence (20) is ambiguous, whereas (21) is not (Kitahara (1996)):

- (20) Someone loves everyone.
- (21) Who saw everyone?

Given the VP-Internal Subject Hypothesis (e.g., Fukui & Speas (1986), cited in Kitahara (1996)) where subject undergoes NP-movement from Spec VP to Spec IP, (20) has the S-structure in (22) (ibid.):

- (22) [_{CP} [_{IP} someone_i [_{VP} t_i loves everyone]]]

Applying QR (May (1977, 1985)) to (22), the LF structure (23) is obtained:

- (23) [_{CP} [_{IP} someone_i [_{IP} t'_i [_{VP} everyone_{e2} [_{VP} t_i loves t₂]]]]]

In much the same way, the LF structure (24) is obtained for (21) (ibid.):

- (24) [_{CP} who_i [_{IP} t'_i [_{VP} everyone_{e2} [_{VP} t_i saw t₂]]]]]

On the assumption of this LF-representation, Aoun & Li (1991, cited in Kitahara (1996)) proposed the chain-based analysis which we have seen in chapter 2, repeated in (25) for convenience (ibid.):

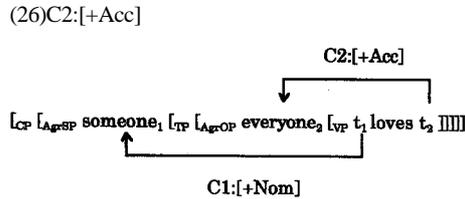
⁴ This section is taken from a previous assignment of the same title.

- (25) a. Minimal Binding Requirement (A & L 1991:164: ())
 A variable must be bound by the most local potential A'-binder.
 b. Scope Principle (A & L 1991:164: ())
 A quantifier A has scope over a quantifier B in case A c-commands a member of the chain containing B.

This correctly explains the ambiguity in (20); however, it fails to explain the lack of ambiguity in (21).⁵ In (23) since *someone*₁ c-commands both members of the chain (*everyone*₂, *t*₁), and *everyone*₂ c-commands a member, *t*₁, of the chain (*someone*₁, *t*₁, *t*₁), both *someone* and *everyone* can take wide-scope over the other. In (6) it leads us to the undesirable result. By this reasoning, (6) also has the reading where *everyone* has wide-scope over *who*, however, this is not the case. To deal with this, Aoun & Li stipulate that an NP-trace coindexed with X_i which is a variable coindexed with *wh*_i does not count as a member of the chain concerned; on the other hand, an NP-trace coindexed with X_i which is a variable coindexed with QP_i is a member of the chain concerned.⁶

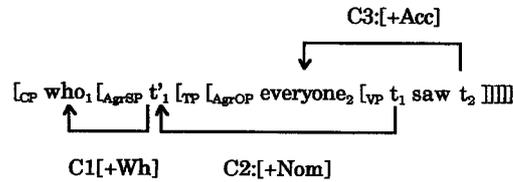
Articulated Chain-Structure and the Scope Principle

Incorporating the VP-Internal Hypothesis and articulated IP-structure (Pollock 1989), Chomsky (1991, 1993) develops a feature-checking theory by introducing AgrSP and AgrOP, and the view that subject and object have their Case-features ([+Nom], [+Acc]) checked in their respective specifier positions. As a result of this feature checking movement, traces are produced and chains are formed for each movement. According to this chain-formation algorithm, the LF structures in (26) and (27) are assigned to (20) and (21) respectively (ibid.):



⁵ It is assumed here:
 1) Traces left by QR are variables.
 2) The definition of potential A-BINDER (Aoun & Li (1991, p.171) cited in Kitahara (1996)) is:
 A qualifies as a potential A-binder for B iff A c-commands B, A is in an A-position, and the Assignment of the index of A to B would not violate any grammatical principle.
 3) The definition of C-COMMAND (Reinhart (1976) cited in Kitahara (1996)) is:
 Node A c-commands node B if neither A nor B dominates the other and the first branching node dominating A dominates B.
⁶ Aoun & Li (1993) revise this stipulation for all NP-traces.

(27)C3:[+Acc]



Note here that under this chain-formation algorithm, two different chains, C1 and C2, can be associated with the single category *who*.

Assuming these LF-representations, a new version of the Scope Principle is formulated (ibid.):

(28) Scope Principle (revised)

A quantifier X may take scope over a quantifier Y iff X c-commands a member of *each* chain associated with Y at LF.

This Scope Principle explains the lack of ambiguity in (21) as follows: *everyone*₂ c-commands a member, *t*₁, of the chain C2(*t*₁, *t*₁); however, it does not c-command any member of the chain C1 (*who*₁, *t*₁). Thus, *everyone* cannot take wide-scope over *who*. On the other hand, since *who*₁ c-commands both members of the chain C3 (*everyone*₂, *t*₂), *who* can take wide-scope over *everyone*.

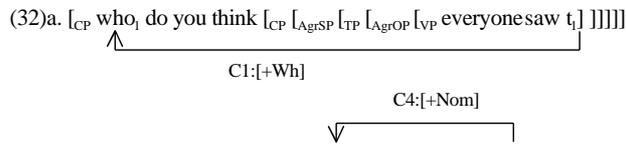
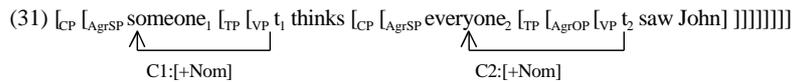
Neither Aoun & Li's stipulation of a certain type of NP-trace nor the LF rule of QR plays a role in scope interpretation.

This Scope Principle also explains the apparently paradoxical contrast between (29) and (30), when compared to that between (20) and (21) (ibid.):

(29) Someone thinks everyone saw John.

(30) Who do you think everyone saw?

According to the chain-formation algorithm, the LF-structures, (31) and (32), are produced for (29) and (31) respectively (ibid.):



Yoshiko Umemori

This scope interpretation theory accounts for the data in Japanese and English (ibid.):⁷

- (35) a. *Daremo*-o_i *dareka*-ga t_i semeta.⁸ (every > some, every < some)
everyone someone blamed
'Someone blamed everyone.'
b. *Nani*-oi *daremo*-ga t_i *kaimasita* ka? 9 (what > every)
what everyone bought inter
'What did everyone buy?'

As shown in (35a), crossing of two QPs after scrambling gives rise to an ambiguity. However, crossing of a quantifier and a WH-expression in (35b) has no such consequence. Tabata maintains that the Japanese focus particles *ka* and *mo* are quantificational elements.¹⁰ Now, as (36) shows, in English, crossing of a WH-expression and a quantifier gives rise to ambiguity (ibid.):

- (36) What_i did everyone buy t_i for Max? (what > every, what < every)

Tabata insists that English WHs bear the quantificational feature [+Q] as in (37) below following Chomsky (1964) and Klima (1964) and then (36) is explained in much the same way as the data in Indonesian and Japanese (ibid.):

- (37) a. wh + someone[+Q] who
b. wh + something[+Q] what

It is clear that Tabata introduces a new perspective into the discussion of scope interpretation to add to the two main positions, that which relies on QR, and that which insists on the adequacy of the newly developed feature-checking theory. To go more deeply into the lexical properties of quantifiers themselves would, in my view, be one effective route for future study in this area in that it takes non-syntactical aspect of language into consideration. One point should be pointed out before closing this section.

It concerns the analysis in (37). If we make use of the example in (35a), the natural implication from it is that *dareka-ga* is equivalent to *someone*:

- (38) someone = dare - ka - ga q.
who p p ([+Nom])

Assuming that *dare* is equivalent to *who* for the time being. The focus particle *ka* has been assumed to be a quantificational element already in this discussion, and the particle *ga* carries a

⁷ In (35) *dare*, *nani* are roughly equal to *who*, *what* respectively. Concerning *ka* and *mo*, see footnote 6 in chapter 2. *-ga* and *-o* indicate [+Nom] and [+Acc] respectively.

⁸ For a problematic aspect for this sentence, see (24) and (25) in chapter 2.

⁹ This sentence also has some problems, but I do not go in detail for it here.

¹⁰ As is maintained later in this section, not only focus particles like *ka* and *mo*, but also case particles like *-ga* and *-o* are quantificational elements (Q-elements).

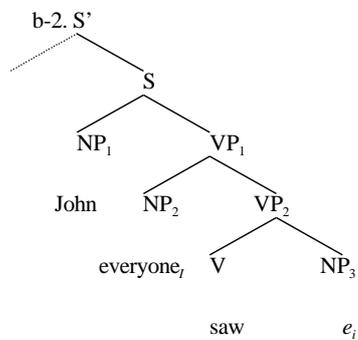
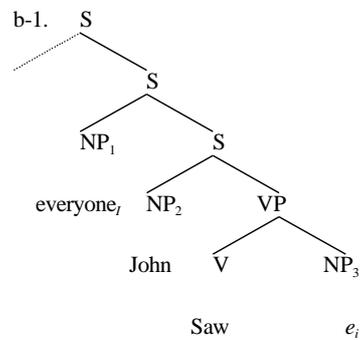
Chapter 4
Revisiting GB

4.1. On May's (1985) Approach

In this chapter, I will start from a reconsideration of May's (1985) approach which we examined in chapter 1.

A first point to note is that the relation between S-adjunction and VP-adjunction is not always clear. As long as the two adjunction possibilities are licensed, it is necessary to consider both of them for even a basic example like (7a) in chapter 1, repeated in (1):

(1) a. John saw everyone



When comparing these two legitimate LF structures, the only difference is only that *everyone* in (b-2) is closer to its trace than in (b-1), i.e., the movement in (b-2) is more economical. To consider the implications of this, let us look at some examples from Japanese:

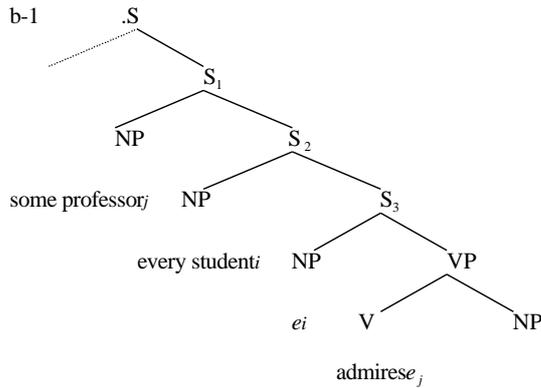
- (2) a. soko-ni i-ta minna-o John-wa mi-ta¹¹
 there be-past everyone-acc - top see-past
 ‘John saw everyone who was there.’
 b. John-wa soko-ni i-ta minna-o mi-ta

Compared to (2b), (14a) places emphasis on *monna-o*, and requires a special context concerning object for it to appear natural. Therefore, it can be said that (2a) is the marked case, and (2b) is the unmarked case. Now, both (2a) and (2b) are realized as distinct surface forms in Japanese, but conceivably this interpretive difference might hold between (1b-1) and (1b-2).¹² Specifically, we might suppose:

- (3) a. The number of the legitimate LF-representation for a sentence correlates with the number of the interpretation, each of them is directly drawn from the syntactic characteristics it represents.
 b. The LF-representation which contains more economical movement of a constituent(s) requires the unmarked reading. The LF-representation which contains less economical movement requires the marked reading.

Next, consider (4):

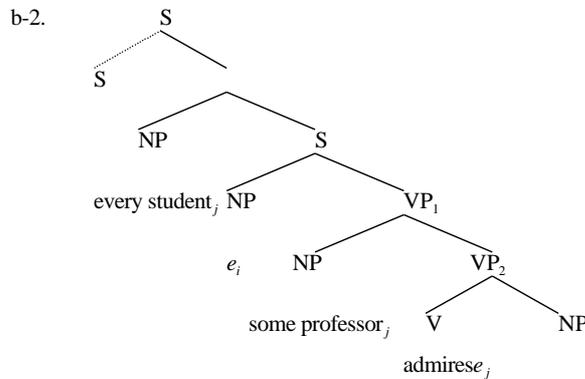
- (4) a. Every student admires some professor



¹¹ *-o* is a case particle [+Acc], *-wa* is a focus particle [+Top], although John is [+Nom] in this case.

¹² This does not mean that the position of *minna(-o)* in (2a) is identical to that of NP₁ in (1b-1), and *John-wa* to NP₂, and also *John-wa* in (2b) to NP₁ in (1b-2) and *minna-o* to NP₂. The point here concerns the relative distance of each phrase from a predicate.

Yoshiko Umemori



Following the analysis in the previous section, both of these two representations are legitimate: in each case e_i and e_j are A-bound and properly governed, and following the assumption in (3a), the sentence (4a) has two interpretations which correspond to the legitimate LF-representations in (4b-1) and (4b-2) respectively. From (3b), since the *every*-phrase and the *some*-phrase are minimally moved in (4b-2), this structure yields the unmarked interpretation. Next, we have to examine the difference between the marked and unmarked reading in (4b-1) and (4b-2). I will pursue this by using Japanese data where we find distinct word order. To obtain as exact Japanese counterparts for (4a) as possible, we have to first look closely at the English quantification in this sentence.

Assuming that the function of *every* has two poles; the primary one which focuses on each member in a group (F1) and the secondary one which takes all members in a group into its view (F2). Therefore, *every* is ambiguous as a result between F1 with F2 and F2 on F1: in the former F1 is primary functioning, but F2 is still functioning secondary, whereas, in the latter F2 is foregrounded on the presupposition of F1. F1 with F2 is the primary function, and F2 on F1 is the secondary of *every*. While in F1 with F2 *every* focuses on each member (F1) with assuming the whole member, in F2 on F1 *every* comes to work primary to take all members into one (F2).

Assuming that $\{X_1, X_2, X_3, X_4\}$ is the set of entities which is specified by the *every*-phrase, and $\{Y_x\}$ is an entity which is specified by *some*-phrase, we can have the same property of four relations from X_x to Y_x , say *admires*, since *some* picks out one entity Y_x from a domain supposed irrespective of identity. That is, $\{Y_x\}$ is multiplied to $\{Y_x, Y_x, Y_x, Y_x\}$ to be interpreted in one to one relation with the entities in the set $\{X_1, X_2, X_3, X_4\}$ respectively. As a result, two types of set are obtained depending on the interpretive possibilities of identification: the one is $\{Y_1, Y_2, Y_3, Y_4\}$, and the other is $\{Y_1, Y_1, Y_1, Y_1\}$. The former gives the distribute reading. On the other hand, in the latter case, $\{Y_1, Y_1, Y_1, Y_1\}$ is further processed up to $\{Y_1\}$, and as a result, new one to one relation is produced between the entire set $\{X_1, X_2, X_3, X_4\}$ and $\{Y_1\}$. This is the reasonable assumption when considering the data where an object is identified already as in

(5):

(5) Every student admires Prof. Smith.

Here, there is no possibility of multiplying Prof. Smith as {Smith₁, Smith₂, Smith₃, Smith₄} because Prof. Smith is a unique entity; the only possibility is for all students to admire a certain professor. Thus, no ambiguity occurs in this case. Now, *each* and *all* can be related to *every*: since *each* does not have the F2, it can not be developed into F2 on F1, on the other hand, *all* strongly focuses on F2, so it does not have the interpretive possibility of F1 with F2.

Next to do is to obtain Japanese counterparts of (4a). The points will be that sentence structure is as similar as possible, that subject bears ambiguity depending on whether it focuses on each member or a entire group, and that object is affected by it. On these conditions, the candidates are obtained in (6), though none of them completely overlaps with (4a).¹³ The symbol % suggests that there should be some modifier in this position to make a phrase following it natural.¹⁴

- (6) a. % gakusei-tachi-wa % dono-kyojyu-ka-o sonkeishi-teiru
(the) student-s-top which-professor-inter-acc admire
- b. % gakusei-tachi-wa mina % dono-kyojyu-ka-o sonkeishi-teiru
(the) student-s-top all which-professor-inter -acc admire
- c. % gakusei-tachi-wa mina sorezore % dono-kyojyu-ka-o sonkeishi-teiru
(the) student-s- top all respectively which-professor-inter-acc a dmire
- d. (%) gakusei-wa mina (kanarazu) dare-ka-kyojyu-o sonkeishi-teiru
student-top all (necessarily) who-inter-professor-acc admires
- (7) % dono-gakusei -mo (kanarazu) dare-ka-%- kyojyu-o sonkeishi-teiru
any -student -too (necessarily) who-inter-%- professor-acc admires

The first difficulty when considering Japanese counterparts of an English quantified sentence like (4a) is the difference between the two languages concerning the relation between expressions and contexts. That is, without any context, QPs in (4a) quantify directly over the domain as the whole world (**D0**); however, whether the domain is pragmatically specified (**D1**)

¹³ (6a) is the counterpart of the sentence (), but it is closely related to (6b,c,d).

() The students admire some professor.

¹⁴ The examples for modifiers are as follows:

for (6a,b,c): sono-gakubu-no gakusei-tachi-wa mina (sorezore)

that -department-of

onaji-gakubu-no dono-kyojyu-ka-o sonkeishi-teiru

same -department-of

for (7): sono-daigaku-de-wa dono-gakusei-mo (kanarazu)

that -university-in-top

dare-ka-jibunno-daigaku-no-kyojyu-o sonkeishi-teiru

who -inter-his -university-of-professor-acc

or not (D0) affects linguistic realizations of the QPs, or sometimes other parts of a sentence in Japanese.

For example, (6a,b,c) and (7) are specific descriptions because they have the QP types (*gakusei-tachi* or *dono-gakusei*) as subjects, followed by the focus particles *-wa* and *-mo* respectively, which implicitly refer to a domain D1 in themselves,¹⁵ and need some modifier to be natural or explicit in the position indicated by % which specifies which D1 they quantify in more detail, although such modifiers can be omitted if the domain is definitely clear from a context. In this case, it is more natural or an unmarked description to have the QP types as objects which also quantify over D1, *dono-(kyojyu)-ka* in (6a,b,c) and *dare-ka-%-(kyojyu)* in (7),¹⁶ rather than the QP type which quantify over D0, *dare-ka-(kyojyu)* in (6d) and (7), as object.¹⁷

On the other hand, (6d) and (7) are generic descriptions. Unlike *gakusei-tachi*, the bare NP *gakusei* in (6d) identifies only the set which contains all elements which all share the property *gakusei*, and does not notice the inside of this set, so that it can easily quantify over D0, so that it does not necessarily require any modifier which indicates a D1.¹⁸ Equally, however, this bare NP can quantify over D1 with some modifier, for example, corresponding to (6d), we have:

- (8) sono-kuni-no-gakusei-wa mina (kanarazu) dare-ka-kyojyu-o sonkeishi-teiru
that-country-in-student-top

In (8) all objects in the country which instantiate the property *gakusei* are quantified.

A second difficulty is the difference between the two languages concerning scope. In the examples in (6) and (7), the phrase(s) which takes wide scope are underlined. To examine scope interactions in (6) and (7), I will make use of figures for convenience.¹⁹ First examine the example (6a) :

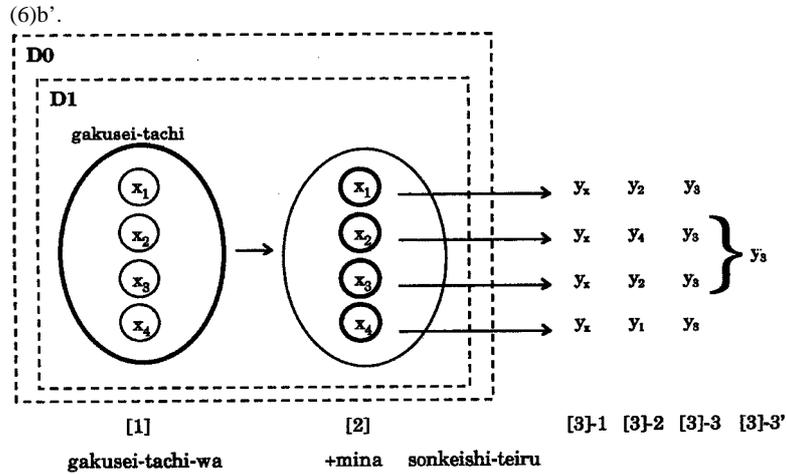
¹⁵ For example, the QP *gakusei-tachi* suggests that a speaker grasps fairly concretely about almost all *gakusei* and this also means that there is a definite boundary of domain within which a speaker's grasp can extend. By virtue of this property, it fundamentally comes to quantify over a D1, and obtains the set which contains all *gakusei* in the D1, but can extend a domain to D0 with a modifier such as *sekaijyu-no* (= in the world) if a speaker is familiar enough with each member in D0. On the other hand, the QP *dono-gakusei* works over such a set which contains all *gakusei* in a D1, and picks out an arbitrary element from it regardless of its identity.

¹⁶ See footnote 15.

¹⁷ For example, the QP *dare-ka-kyojyu* in (6d) and (7) does not require any modifier which indicates a D1, and fundamentally works over a set which contains all professors in D0, and picks out an arbitrary element from it regardless of its identity. However, in most cases a context restricts D0 to a D1, and it is also possible to restrict D0 to some D1 by adding a modifier in the % position in (7). As a result, exceedingly uneconomical and vague quantification is avoided.

¹⁸ Therefore, a set which is quantified by the bare NP *gakusei* therefore contains all professors in D0 is readily quantified by the QP *dare-ka-gakusei* (see footnote 17) and is picked out an arbitrary element

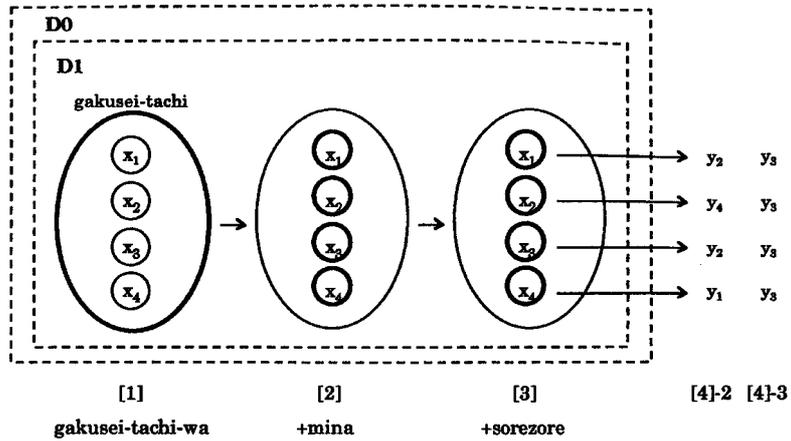
¹⁹ The figures used in what follow are a convention within this work.



The expression *mina* has the function of identifying the inside of the set as is indicated by the bold circles in [2].²¹ As a result, y_x which is an arbitrary element of the set $Y \{y_1, y_2, y_3, y_4\}$ (see (6a')[2]) is multiplied to the set $Y' \{y_x, y_x, y_x, y_x\}$ as the first step in [3]-1 so that each member of the set $X \{x_1, x_2, x_3, x_4\}$ can correspond to an element of Y . Now we have two possibilities for value assignment for x in every y_x in the set Y' : one where all values of x in the set Y' are not identical, the other, where they are in [3]-3. This latter type can be further schematised as in [3]-3', which represents a one (as a whole) to one relation between X and an element of Y . The former [3]-2 corresponds to a distributive reading on the subject, and the latter [3]-3 to a collective one. However, the latter is weaker than the former because of *mina*. Thus, (6b) is ambiguous between distributive and collective readings.

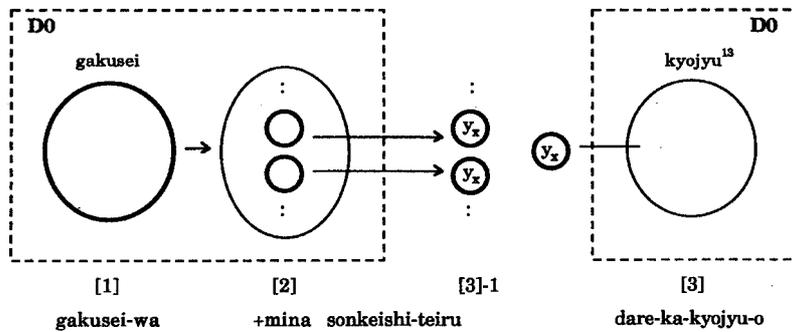
²¹ That is, *mina* is different from *all* as is mentioned already in connection with the analysis of *every* because *all* focuses on the entire as is made up of each member, although I assigned *all* to *mina* in (20b,c,d).

(6)c'.



In this case the ambiguity found in (6b,b') does not arise because the expression *sorezore* works to prevent the process of [3]-3' in (6b') from taking place, and also prevents the elements of the set X being treated as one unit. Although (6c) does not completely exclude the collective reading, since this reading is more economically done by (6a), the distributive reading in [4]-2 is the unmarked reading for (6c).

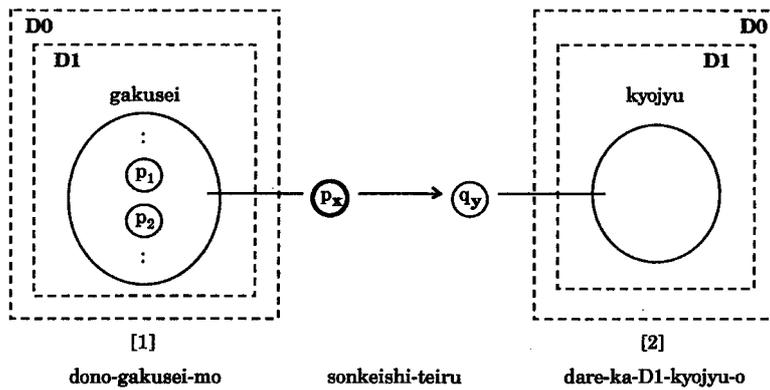
(6)d'.



The bare NP *gakusei* designates all elements in D0 which share the property *gakusei*, and *-wa* picks out these element as one unit, the set X {x|x has the property *gakusei*} in [1]. As already discussed, each element in the set X is focused by *mina* in [2]. On the other hand, the *dare-ka*-phrase picks out an arbitrary element y_x as object from the set Y {y|y has the property

kyojyu } which is obtained by the bare NP *kyojyu* in [3]. Unlike for (6a'), it is correct to say that an arbitrary element y_x is picked out by the *dare-ka*-phrase because nothing is determined in the actual state where the sentence (6d) is used except that there exists the infinite number of element which share the property *kyojyu* in D0. It is the case here that a speaker concentrates on affirming that there is such an element in the set Y as to which the relation *sonkeishi-teiru* holds from an element in the set X, therefore, the value of x in y_x does not the matter. In other words, [3] suggests the affirmation of being of an arbitrary element within the set Y as is indicated by bold circle to which the relation *sonkeishi-teiru* can hold on the presupposition that there exists infinite number of elements as candidates for this status. Thus, an arbitrary element y_x in [3] is multiplied so that each element in the set X can have one to one relation in [3]-1. In this case the value assignment for x of each y_x does not occur because the value for x in y_x does not the matter here. Therefore, only the reading where *gakusei*-phrase has wide scope in [3]-1 is attained.

(7)'.



The *dono*-phrase in [1] picks out an arbitrary element p_x from the set P { $p|p$ has the property *gakusei*} in a D1 which is quantified by the bare NP *gakusei* with the expression which suggests the D1.²² It is correct to say that an arbitrary element p_x is picked out by *dono*-phrase because it is determined in the actual state where the sentence (7) is used that every element in the set P has the relation *sonkeishi-teiru* to an arbitrary element q_y in the set Q { $q|q$ has the property *kyojyu*} in the D1. It is the case in [1] that a speaker knows that every element in the set P can be picked out, but focuses on one being in the set P as is indicated by bold circle and non-identifies (arbitrarize) it as is indicated by bold x so that a hearer can assign any value to it

²² It is also possible that *dono*-phrase to quantify over the set which is quantified by the NP *gakusei-tachi* with the modifier which suggests the D1 when you think you have the grasp of every member in the D1 to a large extent.

within D1. A focus particle *-mo* works to add up all values for x within the D1 to x one by one. Thus, an arbitrary element q_x in the set Q is picked out and connected by the relation *sonkeishi-teiru* to an arbitrary element p_x in the set P one by one. However, also in this case a speaker concentrates on affirming that any p_x has such an element in the set Q as to which the relation *sonkeishi-teiru* holds, so that the value assignment for x in q_x does not occur since the value of x in q_x is not the matter. That the process in [3]-2 and [3]-3 in (6') does not occur means distributive reading is unmarked irrespective of identity. However, it also means that there is a possibility for all to have common person whom they admire accidentally, especially in a restricted domain. Thus, the sentence (7) is considered as almost unambiguous with just a possibility for collective reading.

We have been examining Japanese counterparts of (4a) so far. What we have to do now is to explore how the relative distance of the QPs from a predicate affects the interpretation in (3b). (6b) is suitable for this examination because it is the only example which is ambiguous, although (6a) or (6c) are preferred as realizations of its two readings. Compare, then, (6b) and (9), where (9) is a linear variance of (6b):

(9) % dono-kyojyu-ka-o % gakusei-tachi-wa mina sonkeishi-teiru

The difference here is that which is we can see in the LFs (1b-1) and (1b-2), and there is emphasis on *dono-kyojyu-ka-o* in (9) requiring a special context to make this sentence appear natural.²³ Importantly, it also seems that the wide scope reading for the *dono*-phrase is slightly dominant, contrary to the case in (6b). Let us consider here the relation between the phenomenon which we see in scrambling in Japanese, reordering of constituents in surface form, and two legitimate LF-representations for a surface sentence in English. Assuming that (6b) and (9) are almost equivalent to two legitimate LF-representations for (4a), that is (4b-2) and (4b-2) respectively, neither of them disambiguates (4a), but the scope dominance relation changes in (6b) and (9). From this, we can perceive some related implications: () quantifiers can take scope over a sentence freely from any adjunct position, since in either type of LF-representation (4b-2) or (4b-1), instantiated in a Japanese surface structure (6b) or (9), the c-commanded QPs are not blocked to take wide scope () especially, the former means the unavailability of the notion *government* () but scope dominance relation is changed, when word ordering of constituents is changed, *scrambled* () and a c-commanding QP dominantly requires a wide scope reading.²⁴

Two things are pointed out here. Firstly, when looking at the examples in (6) and (7), the wide scope reading for a c-commanded phrase is not necessarily blocked as in (6a) and (6b), but we can suppose that there is a tendency for a c-commanding phrase to take scope over, say

²³ For example, in a context where it is unexpected each student admires a professor in the same department, a context which might be made explicit by an expression such as, *Amazingly, however*.

²⁴ The implication () conforms with a general assumption that quantifiers have sentential scope, and it is also referred in May (1985) in the notion 'absolute scope.'

subject-object asymmetry. Secondly, when an unscrambled version is (almost) unambiguous, its scrambled version is still unambiguous, and there is no change in scope dominance relation.²⁵ For example, the scrambled version of (6c) in (10) has only the same reading with (6c):

(10) dono-kyojyu-ka-o gakusei-wa mina sorezore sonkeishi-teiru

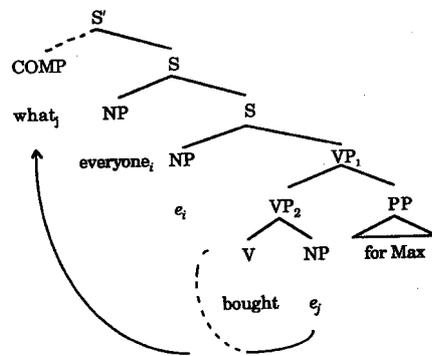
Accordingly, (3b) is revised as follows:

(3b)'. The LF-representation which contains more economical movement of a constituent(s) requires the unmarked reading. The LF-representation which contains less economical movement requires the marked reading. This difference changes dominance relation of scopes of moved constituents when they are QPs.

This observation conforms with the observation in the examples (21) (22) and (23) in chapter 2.

From this, we can conclude that two types of LF-representation in (4b-1) and (4b-2) do not disambiguate a sentence, nor does c-command relation, although they tell a strong tendency for scope relation. Lexical information like that which we examined in *some* and *every*, information from other parts in a sentence, say *mina* and *sorezore* in Japanese, or from perceptual relation determine ultimate interpretation.²⁶ On the reason that to have (4b-1) and (4b-2) does not contribute to disambiguate a sentence, and that (4b-2) is canonical, I only use the type (4b-2) from now. Let us go on to the next example (9a) in chapter 1, repeated in (11):

(11) a. What did everyone buy for Max?
b.



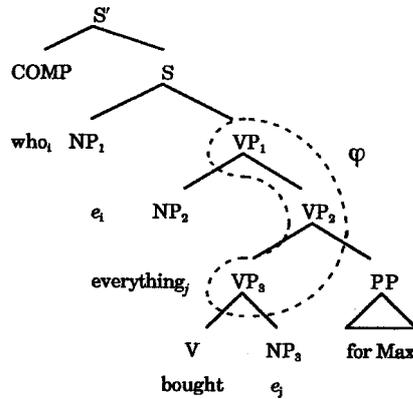
²⁵ 'almost' means that as all examples in (6) and (7) are closely examined later in this section, (6d) and (7) slightly allow the wide scope reading for the c-commanded phrases. In this case, we get the wide scope reading after scrambling for them c-commanding slightly easier, not to say it is dominant.

The WH-phrase can not adjoin to VP, and move to COMP in the syntax, because WHs in English bear the interrogative property [+Wh] and this feature is not allowed to stay within S. We have examined in the section 2 in chapter 2 and in chapter 3 that Japanese WHs do not bear [+Wh], as are felicitously classified as indeterminate pronominals, and also that the combination of a WH-expression and an interrogative complementizer *ka* which bears [+Wh] occupying interrogative Comp on the right boundary is equivalent to a WH-expression in English. On this reason, WHs in Japanese do not need to move in the syntax as is shown in the examples (15) (17) in chapter 2, contrary to the case in English.

That is, (11a) (= (9a) in chapter 1) has only one LF-representation in (11b) (= (9b) in chapter 1. Following May (1985) and the discussion so far in this section, (11b) shows only that both *what* and *everyone* share the same absolute scope domain S within which their scopal properties can freely interact.

Next, to see how their scopes interact, we apply the same process to (11b) which we tried in the example (4a), given that *what* also picks out an arbitrary from D0. The difference between *some* and *what* is that the value of x in Y_x is affirmed or questioned. That is, (11a) is also ambiguous where either of *everyone* or *what* can take scope over the other. Let us examine the example (10) in chapter 1, repeated in (12):

- (12) a. Who bought everything for Max?
 b.



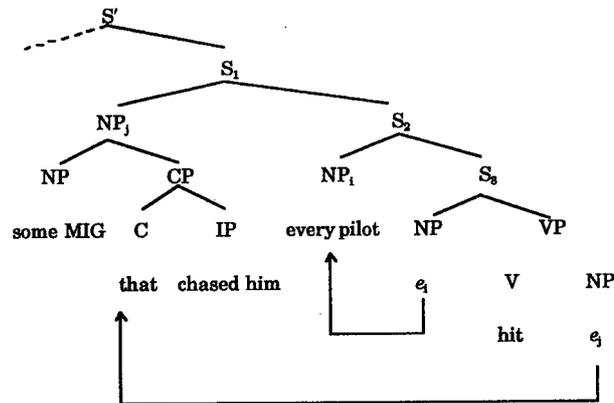
²⁶ As we will examine later in this section, morphology greatly contribute to disambiguate sentences in Japanese.

This legitimate LF-representation also says only that *who* and *everything* can take over the sentence, and interact their scopes freely. The problem here is how their scopal interactions are determined. Contrary to the case in (4) and (11), the *every*-phrase occupies the object position. Applying the same sort of process to (12b) as in (4b) and (11b), since *who* picks out one arbitrary element from D0, *everything* only interpreted as F2 on F1 from the first, that is, treated as one unit according *who*, and no multiplication for *every*-phrase occurs. It will be possible to say that we can also see subject-object asymmetry here. However, the situation is not so simple when we consider the ambiguity in the sentence in (13) below:

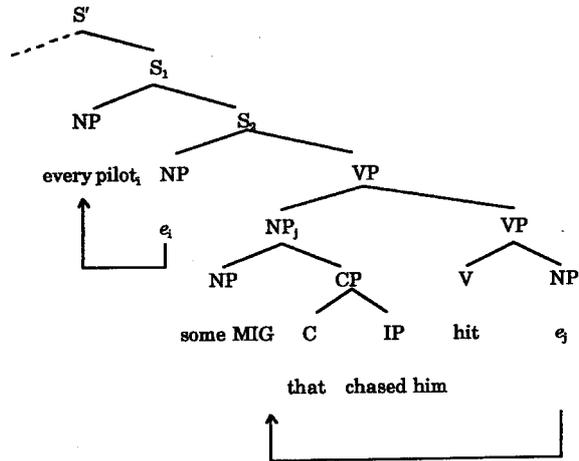
(13) Somebody loves everybody

In (13) the subject *some*-phrase is multiplied according to the interpretation of object *every*-phrase. Now we can give a explanation for this fact by using the results in the comparison of (6b) and (10) above. Fundamentally, possibly conceptually, interpretation of subject has a dominance for that of object taking the wide scope reading dominantly. However, a English constituent structure can allow for a bit more dominance for object than in Japanese and Chinese. I assume that, supporting Aoun & Li (1989), this is because English subject is, possible reconstructed in lower position than in Japanese and Chinese, where subject-object enjoys more logical relation, rather than perceptual relation. However, when a subject WH-expression is moved to Comp in (12) higher than its canonical position in (13), subject in English regains its original dominance again.²⁷ Next consider the example (11) in chapter 1, repeated in (14) below:

(14) a. Every pilot hit some MIG that chased him.
b-1.

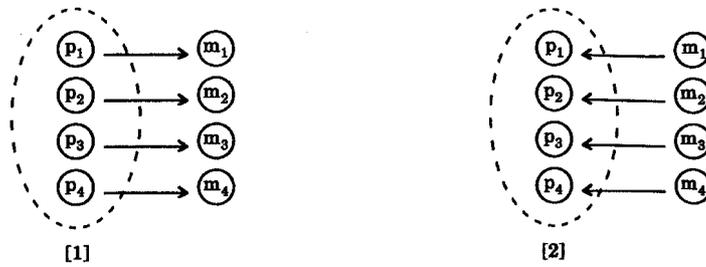


b-2.

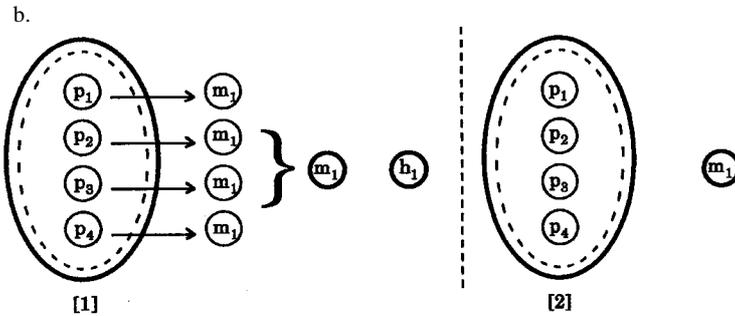


According to the discussion so far, only (14b-2) is made use of as an LF-representation for (14a), and in this LF-representation the *every*-phrase and the *some*-phrase take scope over the entire sentence, and interact their scopal properties freely within it. How their scopal properties interact is the same as in (4a), and then the pronoun *him* is interpreted depending on it.

(15) a.



²⁷ I assume that subject in Japanese and Chinese occupies a high position enough to enjoy perceptual dominance, although it is lower than Comp. Especially, in Japanese Comp is a position for object to have marked reading.



When every pilot in the set $P\{p_1, p_2, p_3, p_4\}$ hit a MIG in the set $M\{m_1, m_2, m_3, m_4\}$ respectively in (15a)[1] (distributive reading), each MIG in the set M could have chased *the pilot* in the set P which later hit it in (15a)[2]. In this case *the pilot* can be referred to by *him* because *the pilot* is a single entity and the pronoun *him* can only refer to a single entity.²⁸ In other words, there are four pilots in this situation, but there is one pilot in terms of each MIG as an object to chase in a range of each MIG.

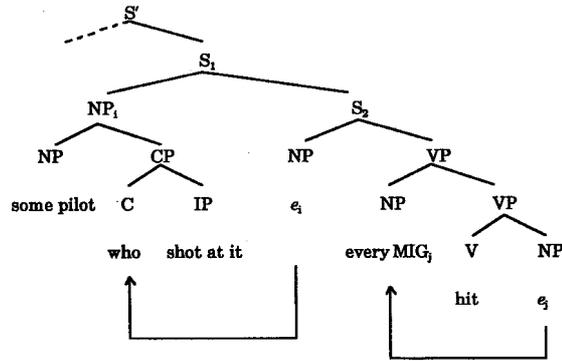
On the other hand, when the pilots in the set P hit the same MIG in (15b)[1] (collective reading),²⁹ the MIG could not have chased the pilots in the set P because it is impossible for one entity to chase more than one entity at the same time,³⁰ but could have chased another entity h_1 in (15b)[2] which existed in the same context, but is not directly mentioned by the sentence (14a). While in the former case the pilots in the set P can not be referred to by *him* because they are not a single entity, although it is a single unit, in the latter case another entity can be referred by *him* because it is a single entity. Let us go on to the example (12) in chapter 1, repeated in (16):

²⁸ The pilot means p_1 for m_1 , p_2 for m_2 , p_3 for m_3 , and p_4 for m_4 .

²⁹ At this stage, the pilots in the set P are considered only as one unit, and they can not be focused distributively anymore. Therefore, it is impossible to refer to them as *him*.

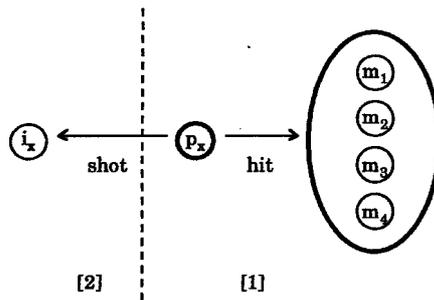
³⁰ The one to one relation can not hold in this case as a pure phenomenon nor as a phenomenon conceptually re-interpreted.

- (16) a. Some pilot who shot at it hit every MIG
 b.



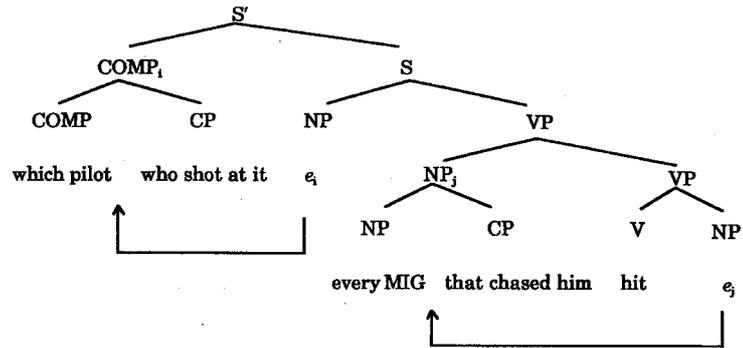
In this LF-representation the *some*-phrase and the *every*-phrase take scope over a sentence, and their scopal properties can interact freely within it.

- (17)



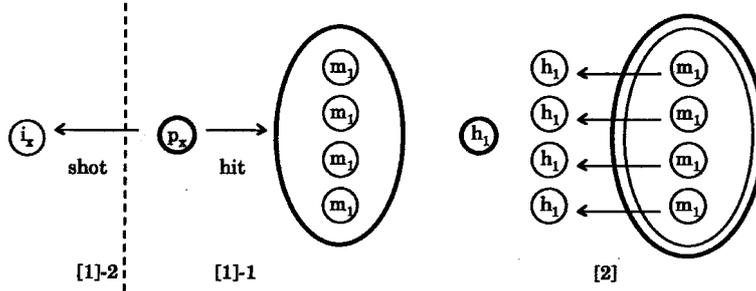
As explained already in (12), when the quantified subject is not ambiguous with only a single entity reading, the quantified object which is ambiguous between whether the elements can be treated as one unit or not is treated only as one unit from the first, and a one to one relation is established at this point in (17)[1]. Therefore, the pronoun *it* cannot refer to every MIG anymore because it is not a single entity, although it is a single unit, and thus has to refer to another entity in the context which is not mentioned directly by in the structure. Finally, let us consider the example (13) in chapter 1, repeated in (18):

- (18) a. Which pilot who shot at it hit every MIG that chased him?
 b.



In this LF-representation the *which*-phrase and the *every*-phrase take sentential scope, and can interact their scopal properties freely within it.

- (19)



In the same way as in (16), since the quantified subject *which*-phrase is not ambiguous with only the reading as an arbitrary entity p_x in [1]-1, *every*-phrase is treated only as one unit from the first, and then one to one relation is established in [1]-1. Therefore, we have no possibility to interpret *it* as referring to *every*-phrase because it is one unit, not one entity, but the possibility to interpret *it* as referring to another entity in the same context which is not directly mentioned by the sentence (18a) in [1]-2, i_x . Also, when *which pilot* hit *every MIG* in [1]-1, *every MIG* could have chased a same person h_1 in [2]. This h_1 can be p_x because h_1 refers to one entity and p_x is one entity. Therefore, *him* can refer to *which pilot*.

4.2. Concluding Remarks

I have concentrated on examining May's (1985) framework in the last chapter. It resulted in adding a revising, but this revision is crucial in that the two types of LF-representation which are supposed by May to disambiguate scopal interactions do not ultimately do the work. However, this line of approach still has insights for the study of this area, especially, that the notion *adjunct* can be made use of as to make it possible for QPs to take sentential scope from its position. It will be possible to think that as much the same way that WH-expressions have the special position to occupy, Comp, quantified phrases also have some different position to occupy from non quantified phrases. However, I also had some conclusion in chapter 3 to the effect that it is reasonable that quantifier's scope can be related to case, specifically, case-checking operation. This supports the Minimalist approach. It will be my future research to seek for a possibility to integrate these two lines of approach.

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