Two Ways of Deriving Distributive Readings

J.-R. Hayashishita

1 Introduction

Consider the example in (1).

(1) (I bet), (at least) *more than two students* will visit *three professors*.

The most natural reading found in (1) is that there are more than two students, and each of the students will visit three professors. However, if we imagine three professors we know, and utter the statement in (1), another reading can be felt quite easily; cf. Chomsky 1957:100-101. The reading is that each of the three professors will be visited by more than two students. I will call both of these readings distributive readings (henceforth DR). In particular, the former will be referred to as the DR for *more than two students* over *three professors* (DR <more than two students, three professors>), and the latter as the DR for *three professors* over *more than two students* (DR <three professors, more than two students>). Despite the fact that DR <non-subject NP, subject NP> does require the speaker's imagination of a specific group while DR <subject NP, non-subject NP> does not, they are generally treated as having an equal status (e.g., Montague 1974, May 1977). Accordingly, it is understood that the scope order of a given sentence cannot be determined with reference to the c-command relation at the point of Spell-Out alone.

In this paper, I argue that there are two ways to interpret sentences. A given sentence can always be interpreted by "directly" mapping the LF representation onto a semantic representation (henceforth SR). But when a sentence is represented at LF in a particular way, it can optionally be interpreted through some extra mechanism, what I call Omega Predication (a special kind of Subject Predication), which makes reference to the speaker's imagination of a specific group. In particular, I claim that DR <NP_1, NP_2> is derived through the "direct" mapping only if NP_1 c-commands NP_2 in their A-positions; i.e., the c-command relation at the point of Spell-Out determines the scope order of a sentence (hence, the scope principle in Reinhart 1976). I will argue in support of this claim by investigating the availability of DR's in the environments where a sentence cannot be interpreted by means of Omega Predication.

U. Penn Working Papers in Linguistics, Volume 6.1, 1999

2 The Availability of DR's with NP Types

It has been commonly assumed that a simplex clause, [NP VERB … NP …], always yields DR <subject NP, non-subject NP> as well as DR <non-subject NP, subject NP>. Liu (1990) points out however that this is not always the case. She claims that DR <non-subject NP, subject NP> is possible when the non-subject NP is of Type A in (2), but not when it is of Type B; see also Beghelli & Stowell 1995.[1,2]

(2) Type A: John and Bill, every boy, all girls, four girls, some boy,
Type B: more than four girls, more than 40%, a good number of people

(3) and (4) illustrate her point.

(3) (I bet, *at least*) *two girls* approached *every boy* (at yesterday's party).
YES DR <non-subject NP, subject NP>

(4) (I bet, *at least*) *two girls* approached *more than five boys* (at yesterday's party).
NO DR<non-subject NP, subject NP>

The non-subject NP in (3) is of Type A while that in (4) is of Type B. DR <non-subject NP, subject NP> is available in the former, but not in the latter. In contrast, DR <subject NP, non-subject NP> is available irrespective of the NP type, as illustrated in (5) and (6).

(5) (At the election) *five students* voted for *some professor*.
YES DR <subject NP, non-subject NP>

(6) (At the election,) *more than five students* voted for *some professor*.
YES DR <subject NP, non-subject NP>

The subject NP in (5) is of Type A, while that in (6) is of Type B. In both cases, DR <subject NP, non-subject NP> is available.

In Japanese, the standard assumption has been that a simplex clause, [NP-NOM … NP-CM … VERB] (where NOM stands for nominative, and CM stands for either accusative or dative), yields DR <subject NP, non-subject NP>, but not DR <non-subject NP, subject NP> (Kuroda 1969/70, Hoji

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[1] Liu (1990) classifies NP's into four categories, based upon the semantic properties such as Strong/Weak and Downward Entailment, and the one of the categories corresponds to Type B in (2). I do not adopt her four-way classifications in part because they are not directly relevant to the claim in this paper.

[2] The distinction between Type A and Type B is made on the basis of the surface judgements. It will be shown in Section 5.1 that it is not a grammatical distinction.

1985). I claim that with the aid of the speaker's imagination of a specific group when the non-subject NP is of Type A in (7), DR <non-subject NP, subject NP> becomes possible; cf. Kitagawa 1990.[3] Thus, the generalization of Japanese resembles that of English – i.e., the NP's of Type A in (7) as a non-subject NP can distribute over a subject NP, but the NP's of Type B cannot.

(7) Type A
Toyota to Nissan 'Toyota and Nissan',
subete-no kaisya 'all companies', daremo 'every man',
sannin-no otoko 'three men', dareka 'someone'.
Type B
sanninizyoo-no otoko 'three or more men',
40%izyoo no gakusee 'more than 40% of the students',
kanarinokazu-no gakusee 'a good number of students'.

(8) and (9) illustrate the generalization.

(8) (watasi-ga kakuninsitatokorodewa), (*sukunakutomo*) *ippon-no ya-ga itutu-no mato-ni* sasatteita. YES DR <non-subject NP, subject NP>
'(as far as I have checked), (*at least*) *one arrow* pierced *five targets*.'

(9) #(watasi-ga kakuninsitatokorodewa), (*sukunakutomo*) *ippon-no ya-ga itutuizyoo-no mato-ni* sasatteita.
'(as far as I have checked), (*at least*) *one arrow* pierced *five or more targets*.' NO DR <non-subject NP, subject NP>

Similar to the case in English, DR <subject NP, non-subject NP> is always possible, irrespective of the NP type, as illustrated in (10) and (11).

(10) *sannin-no otoko-ga hitori-no onna-o* paatii-ni sasotta.
'*three men* invited *one woman* to the party.'
YES DR <subject NP, non-subject NP>

(11) *sanninizyoo-no otoko-ga hitori-no onna-o* paatii-ni sasotta.
'*three or more men* invited *one woman* to the party.'
YES DR <subject NP, non-subject NP>

[3]Kuroda (1970) makes the generalization based upon the examples of [NP-NOM NP-CM … VERB], where the NP-CM is of Type A. Hoji (1985), on the other hand, makes the generalization with the NP-CM that would be derived through a process of attachment transformation, or conjunction reduction in the sense of Kuroda's 1965 dissertation, e.g., NP-*sae* 'NP-even', and NP-ka NP-ka 'NP or NP or.' In this paper, the NP's used in Hoji 1985 are omitted due to space limitation.

The subject NP in (10) is of Type A, while that in (11) is of Type B. In both cases, DR <subject NP, non-subject NP> is available.

The preceding discussion is summarized in (12).

(12) Generalization
In a simplex clause, DR <subject NP, non-subject NP> is always available, while DR <non-subject NP, subject NP> requires that the non-subject NP be of Type A.

3 The Availability of DR's with a Syntactic Environment

The generalization in (12) must be refined. In order for DR <non-subject NP, subject NP> to be available in a simplex clause, the particular syntactic environment in (13) is necessary.

(13) A necessary syntactic environment for DR <non-subj. NP, subj. NP>.
There is an ω-position, an A-position outside of the theta domain of a verb, postulated in Ueyama 1997 & 1998, and it c-commands both the subject NP and the non-subject NP and is not filled at LF.

To provide support for the claim in (13), I need to first establish the existence of an ω-position. For this reason, I will make small excursuses.

3.1 Excursus 1: An A-position outside of the theta domain of a verb (ω-position) (Ueyama 1997 & 1998)

First, consider the following contrast in (14).

(14) a. Every student hit his best friend.
b. *His best friend hit every student.
c. ?*Who$_1$ did [his best friend] hit t$_1$?

The examples in (14b) and (14c) exhibit weak crossover effects (Postal 1971 and Wasow 1972, among others), and it is understood that such effects are induced only when A'-movement takes place. The examples in (15a, b) do not induce weak crossover effects since the movement involved is A-movement, rather than A'-movement.

(15) a. Every daughter$_1$ seems [to her father] t$_1$ to be beautiful.
b. Who$_1$ t$_1$ seems [to his mother] t$_1$ to have come?

In order to account for the contrast between (14b) and (14c), and (14a), (15a) and (15b), let us assume (16).

(16) The Constraint on Weak Crossover Effects
A dependent term can be anaphorically related to an NP by means of bound variable anaphora if and only if it is c-commanded by (a trace of) an NP in an A-position.

Now turning to Japanese examples, it is reported in Hoji 1985 and Yoshimura 1992, among others, that weak crossover effects in (17b) can be remedied if the relevant NP is fronted. Thus, (17c), the "scrambled" counterpart of (17b), does not exhibit weak crossover effects.

(17) a. $[_{S}$ NP-NOM $[_{NP}$… dependent term …]-CM VERB]
b. *$[_{S}$ $[_{NP}$… dependent term …]-NOM NP-CM VERB]
c. $[_{S}$ NP-CM $[_{NP}$… dependent term …]-NOM VERB]

Given (16), the status of (17c) indicates that the fronted NP is in an A-position. Hence there is an A-position outside of the theta domain of a verb, which Ueyama (1997) refers to as an ω-position; cf. Saito 1992 and in particular Ueyama 1998:Ch.2.

3.2 Excursus 2: Two types of clauses (Ueyama 1997 & 1998)

Ueyama's investigation of this issue is more fine-grained. She points out that in some types of clauses, weak crossover effects cannot be remedied even if the relevant NP is fronted. Let us call such clauses U(eyama)-Type clauses. One example of a U-Type clause is an embedded clause of a certain perceptual report construction. The generalization regarding weak crossover effects in the embedded clause is thus modified as in (18).

(18) a. $[_{S\text{-}U}$ NP-NOM $[_{NP}$… dependent term …]-CM VERB]
b. *$[_{S\text{-}U}$ $[_{NP}$… dependent term …]-NOM NP-CM VERB]
c. *$[_{S\text{-}U}$ NP-CM $[_{NP}$… dependent term …]-NOM VERB]
(where S-U signifies a U-Type clause)

Given (16), the status in (18c) indicates that the fronted NP is not in an A-position. Hence, it is reasonable to conclude that U-Type clauses do not contain an ω-position.

She furthermore points out that only one fronted NP can have an A-property. In (19a), there are two instances of the violation of (16). (19b), the "scrambled" counterpart of (19a), is not acceptable. In (19c) and (19e), on the other hand, there is only one instance of the violation of (16). The "scrambled" counterpart of (19c) and (19e); i.e., (19d) and (19f) respectively, are acceptable.

(19) a. *[$_S$ [... dependent$_i$ … dependent$_j$ …]-NOM NP$_i$-CM NP$_j$-CM VERB]
b. *[$_S$ NP$_i$-CM NP$_j$-CM [… dependent$_i$ … dependent$_j$ …]-NOM VERB]
c. *[$_S$ [… dependent$_i$ … *John* …]-NOM NP$_i$-CM NP$_j$-CM VERB]
d. [$_S$ NP$_i$-CM NP$_j$-CM [… dependent$_i$ … *John* …]-NOM VERB]
e. *[$_S$ [… *John* … dependent$_j$ …]-NOM NP$_i$-CM NP$_j$-CM VERB]
f. [$_S$ NP$_i$-CM NP$_j$-CM [… *John* … dependent$_j$ …]-NOM VERB]

Given the Constraint in (16), the status of (19b), in contrast to that of (19d) and (19f), indicates that either NP$_i$-CM or NP$_j$-CM can be in an ω-position, but they cannot be in an ω-position simultaneously. Hence it is reasonable to conclude that a clause has maximally one ω-position.

Hence, Ueyama concludes that there are two types of clauses as in (20).

(20) a. [$_\delta$]
b. [$_\omega$][$_\delta$]

3.3 The availability of DR's with an ω-position

Let us now turn to the claim in (13). In support of (13), I will show that DR <non-subject NP, subject NP> is not available in the environments depicted in (21). (21a) is a case where a clause does not contain an ω-position, and (21b) is a case where a clause contains an ω-position, but it is filled with some other element.

(21) DR <NP$_2$, NP$_1$> is not available in the following environments.
a. … [$_{S\text{-}U}$ *NP$_1$-NOM NP$_2$-CM* VERB]…,
b. [[$_\omega$ NP-CM] [[… dependent …]*NP$_1$*]-*NOM NP$_2$-CM* VERB].

As an illustration of (21a), consider (8) again. Presumably, because of the physics of our present world, the only reading available for (8) is DR <non-subject NP, subject NP>. Suppose (21a) is correct. Then, if we place (8) in the embedded clause of a certain perceptual report construction (U-Type clause), the entire statement should sound odd. The prediction is indeed borne out, as illustrated in (22).

(22) #John to Bill sorezore-ni [$_{S\text{-}U}$ *ippon-no ya-ga itutu-no mato-ni* sasatteiru] no-ga mieta.
'John and Bill each saw [$_{S\text{-}U}$ *one arrow* piercing *five targets*].'

It is not the case that DR <non-subject NP, subject NP> is never allowed in non-matrix clauses. (23) sounds perfect, suggesting that the DR <non-subject NP, subject NP> is available in the embedded clause in (23). Hence the generalization in (21a) has received support.

(23) John to Bill sorezore-ga [$_S$ *ippon-no ya-ga itutu-no mato-ni* sasatteita]-to hookokusita (rasii)
'(it seems that) John and Bill each reported that [$_S$ *one arrow* was piercing *five targets*].'

It should be noted that DR <subject NP, non-subject NP> is available even in a U-Type clause. Consider (24).

(24) John to Bill sorezore-ni [$_{S\text{-}U}$ *hutari-no sensee-ga gonin-no gakusee-o* donarituketeiru] no-ga mieta.
'John and Bill each saw [$_{S\text{-}U}$ *two teachers* scolding *five students*].'

The statement in (24) is true in the world where John and Bill each saw that there are two teachers, and each of the teachers was scolding five students, and the number of students involved was twenty.

Turning to the generalization in (21b), let us consider (25).

(25) <u>hutatuizyoo-no gakkoo</u>-o [<u>soko</u>-o ooensiteiru *dareka*]-*ga* (paatii-ni sankasita) *subete-no kigyoo-ni* urikondeita.
'(Lit.) <u>two or more schools,</u> *someone* who has been supporting <u>it</u> was recommending to *all the companies* (which participated in the party).'

In (25), the fronted NP, *hutatuizyoo-no gakkoo* 'two or more schools', must be in an ω-position; otherwise, weak crossover effects would be induced. In this situation, a non-subject NP *subete-no kigyoo* 'all companies' cannot distribute over *dareka* 'someone'; i.e., (25) allows none of the readings in (26).

(26) a. $^{NO}\underline{\exists Y(Y \subseteq \mathit{company} \wedge |Y| = |\mathit{company}|)\ \forall y(y \in Y)}$ $\underline{[\exists X(X \subseteq \mathit{person} \wedge |X| \neq 0)\ \forall x(x \in X)}$ $[\exists Z(Z \subseteq \mathit{school} \wedge n \geq |Z| \geq 2)$ $\forall z(z \in Z)$ [x who supports z was recommending to y z]]], where n is an integer close to 2.

b. $^{NO}\underline{\exists Y(Y \subseteq \mathit{company} \wedge |Y| = |\mathit{company}|)\ \forall y(y \in Y)}$ $[\exists Z(Z \subseteq \mathit{school} \wedge n \geq |Z| \geq 2)\ \forall z(z \in Z)$ $\underline{[\exists X(X \subset \mathit{person} \wedge |X| \neq 0)\ \forall x(x \in X)}$ [x who supports z was recommending to y z]]], where n is an integer close to 2.

c. $^{NO}\exists Z(Z \subseteq \mathit{school} \wedge n \geq |Z| \geq 2)\ \forall z(z \in Z)$ $\underline{[\exists Y(Y \subset \mathit{company} \wedge |Y| = |\mathit{company}|)\ \forall y(y \in Y)\ [\exists X(X \subseteq \mathit{person} \wedge |X| \neq 0)\ \forall x(x \in X)}$ [x who supports z was recommending to y z]]], where n is an integer close to 2.

If the fronted NP is not related to a dependent term, and hence need not be in an ω-position, a non-subject, *subete-no kigyoo*, can distribute over the subject NP, *dareka*. (28) is one of the readings for (27).

(27) hutatuizyoo-no gakkoo-o *dareka-ga* (paatii-ni sankasita) *subete-no kigyoo-ni* urikondeita.
'(Lit.) two or more schools, *someone* was recommending to *all the companies* (which participated in the party).'

(28) $^{YES}\underline{\exists Y(Y \subset \mathit{company} \wedge |Y| = |\mathit{company}|)\ \forall y(y \in Y)[\exists X(X \subset \mathit{person} \wedge |X| \neq 0)\ \forall x(x \in X)}$ $[\exists Z(Z \subseteq \mathit{school} \wedge n \geq |Z| \geq 2)\ \forall z(z \in Z)$ [x was recommending to y z]]], where n is an integer close to 2.

It should be noted that DR <subject NP, non-subject NP> is available even within the clause where an ω-position is filled. In (29), the fronted NP must be in an ω-position. However (30) is still one of the readings for (29).

(29) hutatuizyoo-no gakkoo-o [soko-o ooensiteiru *subete-no hito*]-*ga* (paatii-ni sankasita) *dokoka-no kigyoo-ni* urikondeita.
'(Lit.) two or more schools, *everyone* who has been supporting it was recommending to *some company* (which participated in the party).'

(30) $^{YES}\exists Z(Z \subseteq \mathit{school} \wedge n \geq |Z| \geq 2)\ \forall z(z \in Z)$ $\underline{[\exists X(X \subset \mathit{person} \wedge |X| = |\mathit{person}|)\ \forall x(x \in X)}$ $\underline{[\exists Y(Y \subset \mathit{company} \wedge |Y| \neq 0)\ \forall y(y \in Y)}$ [x who supports z was recommending to y z]]], where n is an integer close to 2.

The discussion in Section 3 is summarized as (31). The discussion in Section 2 and 3 as a whole is summarized as (32).

(31) Generalization
DR <non-subject NP, subject NP> in a simplex clause is available only if an ω-position, which c-commands both NP's, is not filled at LF, while

DR <subject NP, non-subject NP> is available irrespective of the clause type.

(32) Generalization
DR $<NP_1, NP_2>$ is available only if (i) NP_1 c-commands NP_2 at the point of Spell-Out or (ii) NP_1 is an NP of Type A and there is an ω-position not filled at LF, that c-commands both NP_1 and NP_2.

4 Hypotheses

4.1 Assumptions

First, I assume that all of the NP's of Type A and Type B can be interpreted as either (33a) or (33b) at LF.

(33) a. Generalized Quantifier (henceforth $NP^{I(ndividual)}$) (Barwise & Cooper 1981).
b. Group Existential (henceforth $NP^{E(xistential)}$)

For example, *three men* in *three men came* can be interpreted either as (34a) or as (34b).

(34) a. NP^I: $\exists X(X \subseteq \mathit{men} \wedge |X| = 3)\ \forall x\ (x \in X)\ [V(x)]$
b. NP^E: $\exists X(X \subseteq \mathit{men} \wedge |X| = 3)\ [V(X)]$

I leave open the issue of whether NP^I can be differentiated from NP^E by the introduction of event variables. However, I assume that an NP must be interpreted as NP^I in some environments. One environment is when an NP is related to a singular-denoting dependent term by means of bound variable anaphora. Another environment is when it distributes over another NP.

4.2 The Null Hypothesis

Having made the assumptions regarding the interpretive possibilities of NP's, we are in a position to put forth a hypothesis to account for the Generalization in (32). First, I would like to address the following question.

(35) Why is DR $<NP_1, NP_2>$ always possible if NP_1 c-commands NP_2 at the point of Spell-Out, irrespective of the NP type and the clause type?

To answer the question, I assume that a given sentence can always be interpreted solely on the basis of its LF representation. I claim (36).

(36) The Null Hypothesis
The relative scope of two NP's can be determined from the top node down.

Under (36), the LF representation of a given sentence is mapped onto the SR in such a way that a c-commanding NP scopes over a c-commanded NP. When the c-commanding NP is interpreted as NP^I, it consequentially distributes over the c-commanded NP. Since all the NP's of Type A and Type B can be interpreted as NP^I, they can distribute over the c-commanded NP's.

4.3 The Omega Predication Hypothesis

The next question I would like to address is the following.

(37) How is DR <NP_1, NP_2> derived, where NP_1 does not c-command NP_2?

To answer the question, I claim that a given sentence need not be interpreted solely on the basis of its LF representation. In particular, I claim that a sentence can be interpreted by means of Omega Predication in (38).

(38) The Omega Predication Hypothesis
If a given sentence has the following LF representation, then in SR the "value" of α can be interpreted as a Subject of a Predicate, γ, (hereafter called ω-Predicate), utilizing an ω-position.

At LF 2 At SR

$[_\omega\ ]\quad \gamma \Rightarrow$ [the "value" of α] $\forall x\ (x \in X)\quad \lambda y\ [_\gamma \ldots. y \ldots]\ (x)$

… α … Subject Distributor Predicate (= ω-Predicate)

(39) Three necessary conditions for Omega Predication
a. An ω-position is unfilled at LF.
b. α is interpreted as NP^E at LF.
c. The "value" of α is one of the sets stored in the domain of the speaker's direct experience in the sense of Takubo & Kinsui 1997.

(40) The ω-Predicate Formation Hypothesis

At SR all the NP's in an ω-Predicate are incorporated into a verb to form a Predicate of a Subject in the ω-position.

(41) A necessary condition for ω-Predicate Formation

NP's are interpreted as NP^E at LF.

Now let us see how DR <NP_1, NP_2>, where NP_1 does not c-command NP_2, is derived. Consider DR <every boy, two girls> for (3).

(42) The derivation of DR <non-subject NP, subject NP>

a. PF: *two girls* approached *every boy* (at yesterday's party). (= (3))

b. LF: $[[_{\omega}\ ][_{NP}\text{two girls}]^E \text{ approached } [_{NP}\text{every boy}]^E\,]$

c. SR: $\exists X(X = \Sigma \wedge X \subseteq \mathit{boy} \wedge |\mathit{boy}| = |X|)\ \forall x(x \in X)\ \lambda y[$ *two girls approached* $y](x)$, where Σ is one of the sets stored in the domain in the speaker's direct experience.

d. TC: (42a) is true iff there is a set X, X is one of the sets stored in the domain in the speaker's direct experience, and is a set consisting of all boys such that all x, x is a member of X such that x has the property that two girls approached x.

First, *every boy*, whose value is to be the Subject of an ω-Predicate, and *two girls*, which is to be incorporated into a verb, must be represented as NP^E at LF; thus, (42b). Then, *two girls* is incorporated into a verb, and the SR in (42c) is derived. Hence, DR <non-subject NP, subject NP> is derived.

5 On Omega Predication

5.1 On NP types

We have seen in Section 2 that DR <non-subject NP, subject NP> obtains only if the non-subject NP is of Type A; i.e., the Generalization in (12). Given the Omega Predication Hypothesis, we can now paraphrase the generalization. The "value" of an NP of Type B cannot be a Subject of an ω-Predicate. Although the distinction between Type A and Type B has been crucially made in the preceding discussion, it cannot be considered to be a grammatical distinction for the following reason.

By hypothesis, a Subject of an ω-Predicate is one of the sets stored in the domain of the speaker's direct experience. The intuition behind this hypothesis is as follows. When the sentence, *more than two students will visit three professors*, is interpreted by means of Omega Predication, some set consisting of three professors such as {john, bill, ken} is selected from the domain, and each member of the set is predicated by the ω-Predicate, λy [*two students will visit* y]. In other words, *three professors* functions to "check" which set in the domain is appropriate to be the Subject. In order for a given NP to serve this "checking function", it must be able to denote specific groups since by definition the sets in the domain of the speaker's direct experience are specific groups. The NP's of Type B do not denote a specific group in a normal context. Suppose that our phonology class consists of ten students, {lyn, sue, ken, …}, and all of the ten students attended the class. In this situation, we may say, "All students came / subete-no gakusee-ga kita," or "Ten students came / zyuunin-no gakusee-ga kita." But it is odd to say, "More than eight students came / hatininizyoo-no gakusee-ga kita." Therefore, the NP's of Type B usually do not serve the "checking function" under discussion. Hence, the Generalization in (12) obtains.

However under some appropriate context, it is not impossible for an NP of Type B to denote a specific group. For example,[4] John and Ken are wondering whether they should rob some shops on 5th Avenue in New York. They agreed that they would not execute the plan if more than five buildings on 5th Avenue were guarded. Ken went to spy, and saw seven buildings guarded. He returned, saying, "Well, a guard was standing in front of more than five buildings." In this situation, *more than five buildings* can denote a specific group of seven buildings; thus, its value can be a Subject of an ω-Predicate. As expected, in this situation it can distribute over the subject NP.[5] Even in the examples like (4) and (9) in Section 2, it would not be surprising that DR <non-subject NP, subject NP> would be found if the speaker could conceive some appropriate context so that the non-subject NP could felicitously denote a specific group.

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[4]This context is due to Maria Gallardo (p.c. May 1999).

[5]Ueyama (1998) points out in Appendix D.2.1 that NP's that are able to denote a specific group can be related to a singular-denoting dependent term without invoking weak crossover effects, as illustrated in (i) (cf. (ii)). Ueyama (1997) demonstrates that the acceptability of the examples like (i) becomes degraded when an ω-position is not available.

(i) ?<u>soko</u>-no bengosi-ga <u>subete-no zidoosya gaisya</u>-o uttaeteiru (node, zidoosya gyookai-wa daikonran-ni otiitteiru). (= Ueyama's 1998 (80b))
'(Lit.) (since) <u>its</u> attorney has sued <u>every automobile company,</u> (the automobile industry has been thrown into a state of disorder).'

(ii) ?*<u>soko</u>-no bengosi-ga <u>mittuizyoo-no zidoosya gaisya</u>-o uttaeteiru (node, zidoosya gyookai-wa daikonran-ni otiitteiru).
'(Lit.) (since) <u>its</u> attorney has sued <u>three or more automobile companies,</u> (the automobile industry has been thrown into a state of disorder).'

5.2 On the ω-Predicate Formation Hypothesis

The ω-Predicate Formation Hypothesis in (40) is motivated by the limited interpretive possibilities within an ω-Predicate. In particular, there are phenomena which I refer to as Freezing Effects.

(43) Freezing Effects
The NP's in an ω-Predicate cannot be interpreted as an NP^I.

Given the assumption in 4.1, (44) and (45) follow.

(44) Freezing Effects on Scope
The NP's in an ω-Predicate cannot distribute over another NP.

(45) Freezing Effects on Binding
The NP's in an ω-Predicate cannot be related to a dependent term by means of bound variable anaphora.

As a demonstration of (44), let us consider (46).

(46) (kinoo-no paatii-de)(*sukunakutomo*) *sanninizyoo-no heddohantaa-ga hutari-no hito-ni yottu-no kaisya-o* syookaisiteita (n datte).
'(at yesterday's party) (*at least*) *three or more headhunters* were introducing to *two people four companies*.'

Given the claim in Section 4.3, if a non-subject, *hutari-no hito* 'two people' were to distribute over the subject NP *sanninizyoo-no heddohantaa* 'three or more headhunters', the sentence must be interpreted by means of Omega Predication. Then, *sanninizyoo-no heddohantaa* and the other non-subject NP, *yottu-no kaisya* 'four companies', would be in the ω-Predicate. In this situation, the DR's between *sannin-no heddohantaa* and *yottu-no kaisya* do not obtain; i.e., neither (47a) nor (47b) can be a reading for (46). (48) is the only reading available.

(47) a. $^{NO}\exists Y(Y \subseteq \textit{person} \wedge |Y| = 2)\forall y(y \in Y)$ $\underline{[\exists X(X \subseteq \textit{headhunter} \wedge n \geq |X| \geq 3)\ \forall x(x \in X)\ [\exists Z(Z \subseteq \textit{company} \wedge |Z| = 4)\forall z(z \in Z)}$ [x was introducing to y z]]], where n is an integer close to 3.
b. $^{NO}\exists Y(Y \subseteq \textit{person} \wedge |Y| = 2)\forall y(y \in Y)$ $\underline{[\exists Z(Z \subseteq \textit{company} \wedge |Z| = 4)\forall z(z \in Z)\ [\exists X(X \subseteq \textit{headhunter} \wedge n \geq |X| \geq 3)\forall x(x \in X)}$ [x was introducing to y z]]], where n is an integer close to 3.

(48) $^{YES}\exists Y(Y \subseteq \textit{person} \wedge |Y| = 2)\ \forall y(y \in Y)\ [\exists X(X \subseteq \textit{headhunter} \wedge n \geq |X| \geq 3)\ \exists Z(Z \subseteq \textit{company} \wedge |Z| = 4)\ [\forall x(x \in X)\ \exists z(z \in Z)$ [x was introducing to y z] $\wedge \forall z(z \in Z)\ \exists x(x \in X)$ [x was introducing to y z]]], where n is an integer close to 3.[6]

It should be noted that when the sentence is not interpreted by means of Omega Predication, the subject NP, *sanninizyoo-no heddohantaa* 'three or more headhunters' can distribute over a non-subject NP, *yottu-no kaisya* 'four companies'. (49) is one of the readings for (46). Hence, (44) has received support.

(49) $^{YES}\underline{\exists X(X \subset \textit{headhunter} \wedge n \geq |X| \geq 3)\ \forall x(x \in X)}\ [\exists Y(Y \subseteq \textit{person} \wedge |Y| = 2) \forall y(y \in Y)\ \ \underline{[\exists Z(Z \subset \textit{company} \wedge |Z| = 4) \forall z(z \in Z)}$ [x was introducing to y z]]], where n is an integer close to 3.

Turning to the claim in (45), let us consider the example in (50) and the reading in (51).

(50) *kanarinokazu-no ginkoo-ga mittu-no zidoosya gaisya-ni* Toyota-no torihikisaki-o syookaisita.
'*a good number of banks* introduced to *three automobile companies* Toyota's customers.'

(51) $^{YES}\exists Y(Y \subseteq \textit{automobile-company} \wedge |Y| = 3)\ \forall y(y \in Y)\ [\exists X(X \subseteq \textit{bank} \wedge |X| = k)\ \forall x(x \in X)$ [x introduced to y Toyota's customers]], where k is a number that is considered as large in a given context.

Given the claim in Section 4.3, (51) is derived when (50) is interpreted by means of Omega Predication. Thus, the subject NP is within the ω-Predicate. Now consider (52) and the reading in (53).

(52) <u>*kanarinokazu-no ginkoo*</u>*-ga mittu-no zidoosya gaisya-ni* <u>soko</u>-no torihikisaki-o syookaisita.
'(Lit.) <u>*a good number of banks*</u> introduced to *three automobile companies* <u>its</u> customers.'

(53) $^{NO}\exists Y(Y \subseteq \textit{automobile-company} \wedge |Y| = 3)\ \forall y(y \in Y)\ [\exists X(X \subseteq \textit{bank} \wedge |X| = k)\ \forall x(x \in X)$ [x introduced to y x's customers]], where k is a number that is considered as large in a given context.

[6]I owe Daisuke Bekki (p.c. Dec. 1998) for this formalism.

(52) contrasts minimally with (50). In (52), the subject NP is related to a dependent term. DR <non-subject NP, subject NP> in (53) is not one of the readings for (52).

It should be noted that the subject NP can be related to a dependent term when it is not in an ω-Predicate. The DR in (54), which need not be derived by means of Omega Predication, is one of the readings for (52). Hence, (45) has received support.

(54) $^{YES}\exists X(X \subseteq$ *bank* $\wedge |X| = k)\ \forall x(x \in X)\ [\exists Y(Y \subseteq$ *automobile-company* $\wedge |Y| = 3)\ \forall y(y \in Y)$ [x introduced to y x's customers]], where k is a number that is considered as large in a given context.

Within an ω-Predicate, NP's do not have the interpretive possibilities that they normally have. To account for this, I postulated the ω-Predicate Formation hypothesis.

6 Concluding Remarks

In this paper, I have argued that a given sentence can be interpreted "directly" from the LF representation, or by means of Omega Predication. In the case of the former, DR <NP_1, NP_2> is derived if and only if NP_1 c-commands NP_2, and NP_1 is interpreted as NP^I. In the case of the latter, DR <NP_1, NP_2> is derived only if the following conditions are met. (i) There is an ω-position unfilled at LF, that c-commands both NP's, (ii) both NP_1 and NP_2 are interpreted as Group Existential (NP^E) at LF, and (iii) there is a set in the domain of the speaker's direct experience, which can be denoted by NP_1. Among the implications of this paper are that (i) QR in May 1997 is not necessary in deriving DR <non-subject NP, subject NP>, and that (ii) in the environments where a given sentence has to be interpreted "directly" from its LF representation, the Scope Principle of Reinhart 1976 holds.

This work should be placed among the projects which attempt to isolate phenomena that are purely grammatical from those that are not; e.g. Hoji 1998. I believe that this work has established a means to probe into the nature of some syntactic properties that are sensitive to c-command, based upon the availability of DR's.

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Department of Linguistics
University of Southern California
Los Angeles, CA 90089-1693
hayashis@usc.edu