

More on Two Ways of Deriving Distributive Readings*

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1. Introduction

Generative Grammar aims at discovering the formal properties that mediate between a string of sounds and the corresponding “meaning”, and one of its working hypotheses is that the formal basis of “meaning” of a given sentence is represented in terms of the hierarchical relations among its constituents. The representation is called an LF (representation). Wide-scope distributive readings (hereafter DR’s) are among the phenomena that have been extensively discussed in the investigation of the properties of LF. For expository purposes, let us use $DR\langle\alpha, \beta\rangle$ to signify the DR for α over β . Consider (1).

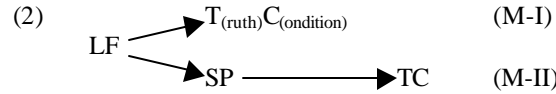
- (1) a. (At least) two students visited three professors (of USC).
b. $\exists X(X \subseteq student \wedge |X| = 2) \forall x(x \in X) [\exists Y(Y \subseteq professor \wedge |Y| = 3) \forall y(y \in Y) [x \text{ visited } y]]$

* The main conclusion of this paper is the same as that of Hayashishita 1999. I would like to thank Hajime Hoji and Ayumi Ueyama, who helped shape the view presented here. Among many others who have helped me understand various issues in this paper are Joseph Aoun, Daisuke Bekki, Hagit Borer, Teruhiko Fukaya, Maria Gallardo, Shadi Ganjavi, Audrey Li, Susan Robinson, Barry Schein, Tim Stowell, Yukinori Takubo, and Yukiko Tsuboi.

$$c. \exists Y(Y \subseteq \textit{professor} \wedge |Y| = 3) \forall y(y \in Y) [\exists X(X \subseteq \textit{student} \wedge |X| = 2) \forall x(x \in X) [x \textit{ visited } y]]$$

(1a) has DR<two students, three professors> as in (1b) and DR<three professors, two students> as in (1c). This fact is taken as evidence for the thesis that there are two LF representations corresponding to the form in (1a). In one LF, *two students* c-commands *three professors*, and in the other, *three professors* c-commands *two students*.

In this paper, I challenge the validity of this thesis, and argue that not all the DR's are derived solely on the basis of the hierarchical information at LF. I will argue in particular that there are two ways to interpret a given sentence (see (2)): (i) solely on the basis of its LF representation (M_(method)-I) and (ii) through Subject Predication, which forms a Subject Predicate representation (henceforth SP) partially based upon its LF representation (M-II).



M-I and M-II can both give rise to DR's; hence there are two kinds of DR's. However, only the DR's derived by M-I are a pure reflection of LF properties. The empirical materials I will put forth below in support of this claim come from Japanese.¹ In particular, it will be claimed that DR<NP_{cm}, NP_{nom}>² in the basic order (see (3a)) and that in the "scrambled"³ order (see (3b)) can arise in different ways. The former must be derived by M-II while the latter can be derived by either M-I or M-II.

(3) a. DR<NP_{cm}, NP_{nom}> in [NP-NOM ... NP-CM ... VERB]

b. DR<NP_{cm}, NP_{nom}> in [NP-CM ... NP-NOM ... VERB]

2. The DR's in Japanese

Regarding the availability of DR's in Japanese, the standard generalization is that the basic order, [NP-NOM ... NP-CM ... VERB], yields DR<NP_{nom}, NP_{cm}> but not DR<NP_{cm}, NP_{nom}> while the "scrambled" order, [NP-CM ... NP-NOM ... VERB], yields both DR<NP_{nom}, NP_{cm}> and DR<NP_{cm}, NP_{nom}> (Kuroda 1969/70, Hoji 1985). However, Kitagawa (1990), Kuroda (1994) and Kuno et al (1999) challenge this generalization, pointing out that the basic order also yields DR<NP_{cm}, NP_{nom}>. Consider (4).

(4) (watasi-ga mitatokorodewa), [NP_{nom} (sukunakutomo) ippon-no ya]-ga [NP_{cm} itutu-no mato]-ni sasatta.

¹ In Hayashishita 1999, I present empirical materials from English in support of the general approach to scope interpretation adopted here.

² 'NOM' stands for nominative, and 'CM' accusative or dative. NP_{nom} signifies a subject NP, and NP_{cm} a non-subject NP.

³ I use the "scrambled" order to refer to the surface order in (3b) without committing myself to any particular analysis.

‘(what I observed was) [_{NP_{nom}} (at least) one arrow] pierced
[_{NP_{cm}} five targets].’

If (4) is uttered in the situation where five targets are standing next to each other without overlapping, the most natural reading is DR<NP_{cm}, NP_{nom}>. That is, each of the five targets has at least one arrow that pierced it.

It will be shown however that there are two kinds of DR’s: one kind is purely due to LF properties, but the other kind is not, and that DR<NP_{cm}, NP_{nom}> in the basic order is of the latter kind. Thus, if the Kuroda/Hoji’s generalization is understood as capturing DR’s of the former kind, the examples like (4) would not constitute counterexamples to it.

3. The Distinct Properties of DR<NP_{cm}, NP_{nom}> in the Basic Order

3.1. NP Types

The distribution of DR<NP_{cm}, NP_{nom}> in the basic order is limited; it is significantly more difficult to obtain if the NP_{cm} is an NP of Type B in (5b); cf. Liu 1990 for the contrast of the same sort in English and Chinese.

(5) a. Type A

Toyota to Nissan ‘Toyota and Nissan’,
subete-no kaisya ‘all companies’, daremo ‘everyone’
sannin-no otoko ‘three men’, dareka ‘someone’

b. Type B

sanninzyoo-no otoko ‘three or more men’,
40% izyoo no gakusee ‘40% or more of the students’,
kanarinokazu-no gakusee ‘a good number of students’

In (6a), the NP_{cm} is of Type A, while in (6b), it is of Type B.

(6) a. (watasi-ga mitatokorodewa), [_{NP_{nom}}(sukunakutomo) ippon-no ya]-ga
[_{NP_{cm}} itutu-no mato]-ni sasatta. (= (4))
‘(what I observed was), [_{NP_{nom}} (at least) one arrow] pierced
[_{NP_{cm}} five targets].’
YES DR<NP_{cm}, NP_{nom}>

b. (watasi-ga kiitatokorodewa), [_{NP_{nom}}(sukunakutomo) ippon-no ya]-ga
[_{NP_{cm}} 15.5% izyoo-no mato]-ni sasatta (rasii yo).
‘(from what I heard), [_{NP_{nom}} (at least) one arrow] pierced
[_{NP_{cm}} 15.5% or more of the targets].’
NO DR<NP_{cm}, NP_{nom}>

DR<NP_{cm}, NP_{nom}> is available in (6a), but not in (6b).

By contrast, DR<NP_{cm}, NP_{nom}> in the “scrambled” order is available irrespective of the NP types, as illustrated below.

(7) a. (watasi-ga mitatokorodewa), [_{NP_{cm}} itutu-no mato]-ni
[_{NP_{nom}}(sukunakutomo) ippon-no ya]-ga sasatta. (Cf. (6a).)
‘(Lit.) (what I observed was), [_{NP_{cm}} five targets], [_{NP_{nom}} (at least) one
arrow] pierced.’
YES DR<NP_{cm}, NP_{nom}>

- b. (watasi-ga kiitatokorodewa), [NP_{cm} 15.5% izyoo-no mato]-ni
 [NP_{nom} (sukunakutomo) ippon-no ya]-ga sasatta (rasii yo). (Cf. (6b).)
 ‘(Lit.) (from what I heard), [NP_{cm} 15.5% or more of the targets],
 [NP_{nom} (at least) one arrow] pierced.’^{YES}DR<NP_{cm}, NP_{nom}>

Note that the NP_{cm} is of Type B in (7b), yet the DR<NP_{cm}, NP_{nom}> is available.

The preceding discussion can be summarized as in (8).

(8) Generalization

DR<NP_{cm}, NP_{nom}> in the basic order is available only if the NP_{cm} is an NP of Type A in (5), while the one in the “scrambled” order is available irrespective of the NP types.

3.2. Freezing Effects

When DR<NP_{cm}, NP_{nom}> obtains in the basic order, the interpretive possibilities of the NP_{nom} are limited. In particular, the NP_{nom} cannot be related to a dependent term by means of bound variable anaphora (Freezing Effects on Binding), or it cannot be distributed over another NP (Freezing Effects on Scope).

Freezing Effects on Binding are illustrated in (9).

- (9) [NP_{nom} kanarinokazu-no ginkoo]-ga [NP_{cm} mittu-no zidoosya gaisya]-ni soko-no torihikisaki-o syookaisita.
 ‘(Lit.) [NP_{nom} a good number of banks] introduced to [NP_{cm} three automobile companies] its customers.’
^{NO}(DR<NP_{cm}, NP_{nom}> & BVA<NP_{nom}, soko>)⁴

In (9), BVA<NP_{nom}, soko> cannot co-occur with DR<NP_{cm}, NP_{nom}>. As indicated in (10), each of the relevant BVA and the relevant DR can obtain in the absence of the other.

- (10) a. [NP_{nom} kanarinokazu-no ginkoo]-ga [NP_{cm} mittu-no zidoosya gaisya]-ni Toyota-no torihikisaki-o syookaisita.
 ‘[NP_{nom} a good number of banks] introduced to [NP_{cm} three automobile companies] Toyota’s customers.’^{YES}DR<NP_{cm}, NP_{nom}>
 b. [NP_{nom} kanarinokazu-no ginkoo]-ga Toyota-ni soko-no torihikisaki-o syookaisita.
 ‘(Lit.) [NP_{nom} a good number of banks] introduced to Toyota its customers.’^{YES}BVA<NP_{nom}, soko>

DR<NP_{cm}, NP_{nom}> in the “scrambled” order, on the other hand, does not induce Freezing Effects on Binding. DR<NP_{cm}, NP_{nom}> can co-occur with BVA<NP_{nom}, soko>, as illustrated in (11).

⁴ BVA <α, β> signifies the bound variable anaphora between α and β.

- (11) [NP_{cm} mittu-no zidoosya gaisya]-ni [NP_{nom} kanarinokazu-no ginkoo-ga soko-no torihikisaki-o syookaisita. (Cf. (9).)
 ‘(Lit.) to [NP_{cm} three automobile companies], [NP_{nom} a good number of banks] introduced its customers.’

^{YES}(DR<NP_{cm}, NP_{nom}> & BVA<NP_{nom}, soko>)

(12) illustrates that DR<NP_{cm}, NP_{nom}> in the basic order induces Freezing Effects on Scope.

- (12) (kinoo-no paatii-de)[NP_{nom} (sukunakutomo) sanninizyoo-no heddohantaa]-ga [NP_{cm} hutari-no hito]-ni [NP_α yottu-no kaisya]-o syookaisiteita (n datte).
 ‘(at yesterday’s party) [NP_{nom} (at least) three or more headhunters] were introducing to [NP_{cm} two people] [NP_α four companies].’

^{NO}(DR<NP_{cm}, NP_{nom}> & DR<NP_{nom}, NP_α>)⁵

DR<NP_{cm}, NP_{nom}> and DR<NP_{nom}, NP_α> cannot obtain simultaneously. When DR<NP_{cm}, NP_{nom}> obtains, the only possible reading for (12) is (13).

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

It should be noted that DR<NP_{nom}, NP_α> is independently possible, as shown in (14).

- (14) (kinoo-no paatii-de)[NP_{nom} (sukunakutomo) sanninizyoo-no heddohantaa]-ga [NP_{cm} Smith-san]-ni [NP_α yottu-no kaisya]-o syookaisiteita (n datte).
 ‘(at yesterday’s party) [NP_{nom} (at least) three or more headhunters] were introducing to [NP_{cm} Mr. Smith] [NP_α four companies].’

^{YES}DR<NP_{nom}, NP_α>

DR<NP_{cm}, NP_{nom}> in the “scrambled” order, on the other hand, does not induce Freezing Effects on Scope. DR<NP_{cm}, NP_{nom}> and DR<NP_{nom}, NP_α> can obtain simultaneously, as illustrated in (15).

- (15) (kinoo-no paatii-de) [NP_{cm} hutari-no hito]-ni [NP_{nom} (sukunakutomo) sanninizyoo-no heddohantaa]-ga [NP_α yottu-no kaisya]-o syookaisiteita (n datte).

⁵ The reading that (12) lacks can be expressed as (i)

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

‘(Lit.) (at yesterday’s party) to [_{NP_{cm}} two people], [_{NP_{nom}} (at least) three or more headhunters] were introducing [_{NP_α} four companies].’
^{YES}(DR<NP_{cm} NP_{nom}> & DR<NP_{nom} NP_α>)

The discussion in this subsection is recorded as (16). The discussion in Section 3 as a whole can be summarized as (17).

(16) Generalization

DR<NP_{cm} NP_{nom}> in the basic order induces Freezing Effects, while the one in the “scrambled” order does not.

(17) a. DR<NP_{cm} NP_{nom}> in the basic order

- (i) It requires that the NP_{cm} be of Type A.
- (ii) It induces Freezing Effects.

b. DR<NP_{cm} NP_{nom}> in the “scrambled” order

- (i) It is available irrespective of the NP types.
- (ii) It does not induce Freezing Effects.

4. Hypotheses

4.1. Assumptions

Let us first spell out some basic assumptions. I assume that all of the NP’s of Type A and Type B can be interpreted either as (18a) or as (18b).

(18) a. Generalized Quantifier (henceforth NP^(individual))
 (Barwise & Cooper 1981)

b. Group Existential (henceforth NP^{G(roup)})

For the sake of concreteness, let us assume that there is some marking at LF to signal whether a given NP is interpreted either as NP^I or as NP^G.⁶ Consider (19).

(19) sanninzyoo-no hito-ga kita. ‘three or more men came.’

If *sanninzyoo-no hito* is marked as NP^I as in (20a), the TC is (20b). On the other hand, if it is marked as NP^G as in (20a’), the TC is (20b’).⁷

(20) a. LF: [_{NP} sanninzyoo-no hito]^I-ga kita.

- b. TC: (20a) is true iff there is three or more x, x is a man, such that x came.

⁶ There is no reason, other than an expository one, to assume the marking at LF. For example, one may assume that *sanninzyoo-no hito* is represented at LF either as (i) [_{DP} sanninzyoo(-no) [_{NP} hito]] or as (ii) [_{DP} ec [_{NP} sanninzyoo-no hito]]. When *sanninzyoo-no hito* is represented as (i), it undergoes QR, leaving a singular variable, and the NP^I interpretation is induced. On the other hand, when it is represented as (ii), it is an indefinite, and bound by an existential closure; thus, the NP^G interpretation is derived.

⁷ I leave open the issue of whether NP^I can be differentiated from NP^G by the introduction of event variables.

a'.LF: [_{NP} sanninzyoo-no hito]^G-ga kita.

b'.TC: (20a') is true iff there is X, X is a set consisting of three or more men, such that X came.

The assumptions just made have the following consequences. When a given sentence is interpreted solely on the basis of its LF representation, (i) an NP α establishes bound variable anaphora with a dependant term β only if α is interpreted as NP^I, and (ii) the distributive reading for an NP α over an NP β obtains only if α is interpreted as NP^I.

4.2. Hypothesis (1) – The Scope Principle

We have seen in Section 3 that the distribution of DR<NP_{cm}, NP_{nom}> in the basic order is more limited than that in the “scrambled” order. I claim that there is a means which gives rise to DR<NP_{cm}, NP_{nom}> in the “scrambled” order but not in the basic order (M-I). Now the question is what M-I is. To answer the question, I maintain (21), following the standard assumption.

(21) A given sentence is always able to be interpreted solely on the basis of its LF representation.

I claim that when a given sentence is interpreted solely on the basis of its LF representation, the Scope Principle postulated in Reinhart 1976 and Huang 1982 holds. I restated their versions as in (22).

(22) The Scope Principle (M-I) (Cf. Reinhart 1976 and Huang 1982.)

An NP α takes scope over an NP β only if α and β are in A-positions, and α c-commands β at LF.⁸

Given (22), DR's are derived if an NP taking wide-scope is interpreted as NP^I.

Turning to DR<NP_{cm}, NP_{nom}> in the “scrambled” order, it is unanimously accepted that the “clause-internally scrambled” NP shows A-properties (Saito 1992, Yoshimura 1992, and Ueyama 1998). I assume, following Ueyama 1998 in particular, that the form in (23a) may be represented as (23b) at LF.⁹

(23) a. PF: NP-CM NP-NOM VERB

b. LF: NP-CM NP-NOM VERB (the NP's are in A-positions)

In (23b), the NP_{cm} c-commands the NP_{nom} in A-positions; thus, as long as the NP_{cm} can be interpreted as NP^I, DR's can be derived. Since all the NP's in Type A and Type B can be interpreted as NP^I, DR<NP_{cm}, NP_{nom}> in the

⁸ I have provided a simplified version here without assuming QR. This assumption however does not affect the arguments in this paper.

⁹ Saito (1992) and Yoshimura (1992) assume that an NP can show A-properties outside the theta domain of a verb when it is “fronted” by movement. Ueyama (1998), on the other hand, argues that the A-position outside the theta domain of a verb is “base-generated” independently of the existence of movement.

“scrambled” order obtains irrespective of the NP type. It also follows from (22) that $DR\langle NP_{cm}, NP_{nom} \rangle$ in the basic order cannot be derived by M-I since the relevant c-command relation is absent.

4.3. Hypothesis (2) – Subject Predication

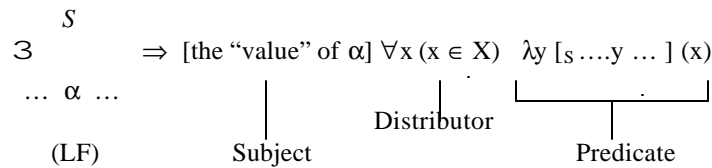
Let us address the question of how $DR\langle NP_{cm}, NP_{nom} \rangle$ in the basic order is derived (M-II). First, I maintain (24).

- (24) A given sentence may not be interpreted solely on the basis of its LF representation.

I claim that when certain conditions are met, a given sentence can be interpreted by means of Subject Predication in (25).

- (25) The Subject Predication Hypothesis (M-II)

If a given sentence has the following LF representation, then at some cognitive level the “value” of α can be interpreted as the Subject of a Predicate S



This hypothesis consists of two parts. First, from a given LF representation, a Predicate is formed by substituting a variable for an NP α whose “value” is to be the Subject. Second, some set γ is taken from the domain of the speaker’s direct experience in the sense of Takubo and Kinsui 1997 to be the Subject of the Predicate, and γ must be able to be “associated with” α . It should be noted that an SP is not a syntactic representation but a cognitive representation of some sort.

I also propose (26) and (27) to account for Freezing Effects.

- (26) The Predicate Formation Hypothesis

In constructing an SP from a given LF, all the NP’s, other than the NP whose “value” is to be the Subject, are incorporated into a verb to form a Predicate of the Subject.

- (27) A necessary condition for Predicate Formation

No NP’s in a Predicate may be interpreted as NP^I.^{10,11}

¹⁰ The Predicate in this paper must be differentiated from the Predicate of a WA-topicalized phrase in Kuroda 1992: Ch.1, wherein Freezing Effects do not seem to be induced.

¹¹ I am suppressing the fact that when $DR\langle NP_2, NP_1 \rangle$ obtains in the configuration, [... NP₁ ... NP₂ ... [... NP₃ ... NP₄ ... VERB] ... VERB] (where each of the NP’s c-commands the NP’s to its right), Freezing Effects are not induced in the embedded clause; i.e., $DR\langle NP_3, NP_4 \rangle$ is possible. It seems that Freezing Effects are limited only to the NP’s that are clause-mates of an NP whose “value” is to be a Subject.

To illustrate the claims, let us go through the derivation of $DR\langle NP_{cm}, NP_{nom} \rangle$ in (4).

- (28) a. PF: $[_{NP_{nom}}(\text{sukunakutomo}) \text{ ippon-no ya}]$ -ga $[_{NP_{cm}} \text{ itutu-no mato}]$ -ni sasatta. (= (4))
 ‘ $[_{NP_{nom}}$ (at least) one arrow] pierced $[_{NP_{cm}}$ five targets].’
- b. LF: $[[_{NP_{nom}}(\text{sukunakutomo}) \text{ ippon-no ya}]^G$ -ga $[_{NP_{cm}} \text{ itutu-no mato}]^{1(\text{or } G)}$ -ni sasatta]
- c. SP: $\exists X(X = \Sigma \wedge X \subseteq \text{target} \wedge |X| = 5) \forall x(x \in X) \lambda y[\text{(at least) one arrow pierced } y](x)$, where Σ is one of the sets stored in the domain of the speaker’s direct experience.
- d. TC: (28c) 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 five targets, such that for all x , x is a member of X , such that x has the property that (at least) one arrow pierced x .

In order to interpret the sentence in (28a) by means of Subject Predication, it must be represented as in (28b) at LF where the NP_{nom} to be incorporated into a verb is represented as an NP^G . In constructing the SP in (28c), a set of 5 targets is chosen from the domain of the speaker’s experience, and is taken to be a Subject, and the NP_{nom} is incorporated into a verb to form a Predicate. Each of the 5 targets is associated with the Predicate through a hidden distributor.¹² The TC in (28d) is calculated on the basis of (28c); thus, $DR\langle NP_{cm}, NP_{nom} \rangle$ obtains.

4.3.1. On Subject

I have put forth the hypothesis that $DR\langle NP_{cm}, NP_{nom} \rangle$ in the basic order must be derived by means of Subject Predication, and that a Subject is not a linguistic expression but an object (a specific group in the cases under discussion) in the domain of the speaker’s direct experience and can be “associated with” the NP_{cm} . The intuition behind this hypothesis is that the function of the NP_{cm} is only to “check” whether a specific group taken from the domain is appropriate or not. For example, when the NP_{cm} is *gonin-no gakusee* ‘five students’, a group of six students or a group of five teachers cannot be taken from the domain as corresponding to this NP. Consider (29).

(29) Dialogue¹³

A: $[_{NP} \text{ gonin-no kakkoi} \text{ gakusee}]$ -ga paatii-ni kita rasii yo.
 ‘ $[_{NP}$ five handsome students] came into the party, I heard’

B: sitteru. $[_{NP_{nom}}(\text{sukunakuomo}) \text{ sanninizyoo-no onnanoko}]$ -ga
 $[_{NP_{cm}} \text{ soitura}]$ -ni iiyotta n datte.

¹² I assume that the hidden distributor here is a concept outside the syntax.

¹³ I thank Hajime Hoji for bringing this example to my attention (p.c. Oct. 1999).

‘I know. [_{NP_{nom}} (at least) three or more girls] have approached
[_{NP_{cm}} them], I heard.’

- (30) $\exists Y(Y \subseteq \textit{handsome-student} \wedge |Y| = 5) \forall y(y \in Y) [\exists X(X \subseteq \textit{girl} \wedge n \geq |X| \geq 3) \forall x(x \in X) [x \textit{ approached } y]]$, where n is an integer close to 3.

In (29B), the NP_{cm} is not a quantified expression, but the DR in (30) is available. I would like to claim that the DR in (30) is also due to Subject Predication.

Ueyama (1998) points out that the felicitous use of a *so*-series demonstrative requires a linguistic antecedent.¹⁴ The point can be illustrated in (31), for example. The contrast as reported in (31) is pointed out in Kuroda 1979.

- (31) Someone's Monologue (at 6:00 a.m. immediately after he woke up)
{#*soitura/aitura*}-no namae-wa nandattakke.
'what was their name?'

Given that the DR in (30) is available for (29B), we must conclude that a specific group of five handsome students taken from the domain of the speaker's direct experience is judged as appropriate to be a Subject by the "checking" of *soitura* 'them'. Thus, *soitura*, which cannot be referential by itself, can serve the "checking" function with the "help" of the utterance of (29A), which contains *gonnin-no kakkoii gakusee* 'five handsome students'.

We have seen in Section 3.1 that DR<NP_{cm}, NP_{nom}> in the basic order requires that the NP_{cm} be of Type A, but not of Type B. Given the Subject Predication Hypothesis, we can understand this generalization as follows: the NP's of Type A but not those of Type B can serve the "checking" function. This is a feasible conclusion. Consider the NP's of Type B in (5) once again, repeated here as (32).

- (32) Type B
sanninizyoo-no otoko 'three or more men',
40%izyoo no gakusee '40% or more of the students',
kanarinokazu-no gakusee 'a good number of students'

The NP's in (32) either do not set an upper bound due to the lexical meaning of *izyoo* 'more' or do not specify the exact size (*kanarinokazu* 'a good number'); therefore, they "usually" do not denote a specific group. By definition, all the sets in the domain of the speaker's direct experience are specific groups; hence, the NP's of Type B fail to serve the "checking" function in a normal context. But if we supply some appropriate context so that the speaker can identify a specific group with an NP of Type B, they

¹⁴ What Ueyama calls the "non-individual" use of *so* is being ignored in this discussion; see Ueyama 1998: Appendix D.

can also serve the “checking” function. For example, consider the following scenario. John and Ken are wondering whether they should rob some shops on 5th Avenue in New York. They agree that they will not execute the plan if more than five buildings on 5th Avenue are guarded. Ken goes to spy, and sees seven buildings guarded. He returns and says, *dameda*, (*sukunakutomo*) *hitori-no gaadoman-ga itutuizyoo-no biru-no mae-ni tatteita* ‘well, (at least) one guard was standing in front of five or more buildings’.¹⁵ In this situation, *itutuizyoo-no biru* denotes a specific group of seven buildings. As expected, DR<NP_{cm}, NP_{nom}> is possible in this situation.¹⁶

4.3.2. The Subject Predication Hypothesis and Categorical Judgment

Kuroda (1992: Ch.1) argues that two types of judgments (thetic and categorical judgments) correspond to two types of sentence forms in Japanese (the “WA-topicalized sentence” and the “non-WA-topicalized sentence”). Ueyama (1998: Ch.2 Section 2.4.3) claims that even in non-matrix clauses, where judgments are not relevant, some distinction must be made, corresponding to the thetic/categorical distinction. Let us rephrase her claim as follows: at some cognitive level, a thetic representation and a categorical representation are distinguished. I claim that Subject Predication in this paper forces a categorical representation. It is predicted therefore that DR<NP_{cm}, NP_{nom}> in the basic order becomes unavailable in the environments where a categorical representation is not allowed.

Ueyama (1998) claims, in our terms, that the embedded clause of the perceptual report construction in (33) expresses eventuality, and it must be realized as a thetic representation.

- (33) John-ni [_S* Mary-ga aruiteiru] tokoro-ga mieta.
 ‘John saw [_S* Mary walking].’

We then predict that DR<NP_{cm}, NP_{nom}> in the basic order is not possible within the embedded clause in the perceptual report construction. The prediction is indeed borne out. Consider (34).

¹⁵ I thank Maria Gallardo (p.c. May 1999) for the context just given and relevant discussion.

¹⁶ 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). She also demonstrates that the status of the examples like (i) becomes degraded in the environment where a thetic representation is forced (see Section 4.3.2). I suspect that the contrast between (i) and (ii) can be explained once we assume that Subject Predication is established in (i) but not in (ii).

- (i) ?*soko-no bengosi-ga subete-no zidoosya gaisya-o uttaeteiru* (node, zidoosya gyookai-wa daikonran-ni otiiteiru). (= Ueyama’s 1998 (80b))
 ‘(Lit.) (since) its attorney has sued every automobile company, (the automobile industry has been thrown into a state of disorder).’
- (ii) ?**soko-no bengosi-ga mittuizyoo-no zidoosya gaisya-o uttaeteiru* (node, zidoosya gyookai-wa daikonran-ni otiiteiru).
 ‘(Lit.) (since) its attorney has sued three or more automobile companies, (the automobile industry has been thrown into a state of disorder).’

- (34) John to Bill sorezore-ni [_{S*}[_{NP_{nom}} (sukunakutomo) hutari-no
gakusee]-ga [_{NP_{cm}} (USC-no gengogakubu-no) gonin-no kyoozyu]-ni
hanasikaketeiru]-tokoro-ga mieta.
'John and Bill each saw [_{S*}[_{NP_{nom}} (at least) two student] speaking to
[_{NP_{cm}} five professors (of USC Linguistics)]]'.
[_{S*}^{NO}DR<NP_{cm}, NP_{nom}>]

One may wonder if DR <NP_{cm}, NP_{nom}> is ever allowed in the non-matrix context. As shown in (35), DR<NP_{cm}, NP_{nom}> is possible in the embedded clause.

- (35) John to Bill sorezore-ga [_S[_{NP_{nom}} (sukunakutomo) hutari-no
gakusee]-ga [_{NP_{cm}} (USC-no gengogakubu-no) gonin-no kyoozyu]-ni
hanasikaketeita]-to hookokusiteita.
'John and Bill each reported that [_S[_{NP_{nom}} (at least) two student] was
speaking to [_{NP_{cm}} five professors (of USC Linguistics)]]'.
[_S^{YES}DR<NP_{cm}, NP_{nom}>]

Hence the unavailability of DR<NP_{cm}, NP_{nom}> in (34) cannot simply be attributed to the fact that the relevant sentence is embedded.

5. Two Alternative Analyses

I have argued, on the basis of the distribution of DR<NP_{cm}, NP_{nom}> in the basic order, that LF cannot be the sole basis for wide-scope construal (and for the interpretation of a sentence in general), proposing that certain instances of wide-scope construal (DR<NP_{cm}, NP_{nom}> in the basic order, for example) are due to Subject Predication, which is outside the syntax. In this section, I will provide further support for the proposal by reviewing two purely syntactic analyses of DR<NP_{cm}, NP_{nom}> in the basic order.

Suppose that the DR<NP_{cm}, NP_{nom}> in the basic order were derived by the covert A-movement of the NP_{cm}, as indicated in (36) below. The DR in the basic order in (36a) and that in the “scrambled” order in (37a) would then be based on the identical LF representation.

- (36) a. PF: NP_{nom} ... NP_{cm} ... VERB
b. LF: NP_{cm} NP_{nom} ... t_{cm} ... VERB (the NP's are in A-positions)
(37) a. PF: NP_{cm} NP_{nom} ... t_{cm} ... VERB
b. LF: NP_{cm} NP_{nom} ... t_{cm} ... VERB (the NP's are in A-positions)

We would then predict that they manifest the same interpretive possibilities. However, as we have observed, the prediction is not borne out; Freezing Effects are induced in the former but not in the latter.

Recall that DR<NP_{cm}, NP_{nom}> in the basic order requires that the NP_{cm} be of Type A (Section 3.1). We also saw in Section 4.3.1 that even if the NP_{cm} is of Type B, the addition of an appropriate context makes DR<NP_{cm}, NP_{nom}> available. Thus, if we were to assume that the DR is derived by A-movement, we would have to state that the movement does not apply to the

NP's of Type B in general but it does when some appropriate context is conceivable. It seems rather difficult to determine the syntactic category the movement makes reference to. The same problem would arise for the covert A'-movement analysis.¹⁷ Hence, the covert (A or A') movement analysis cannot be maintained.

It should also be pointed out that there are two additional sets of facts that can be accounted for by the Subject Predication Hypothesis but cannot be accommodated by the covert (A or A') movement analysis without further stipulations. Consider the configuration in (38).

- (38) LF: NP₁ ... NP₂ ... NP₃ ... VERB, where all the NP's are in an A-position and each of the NP's c-commands the NP's to its right.

The Subject Predication Hypothesis makes the following predictions.

- (39) a. When the NP₃ takes scope over the NP₂, it must also scope over NP₁.
 b. Only one NP can take scope over its c-commanding NP; i.e., it is not possible that both the NP₂ and the NP₃ take scope over the NP₁.

The predictions are indeed borne out. Consider (40).

- (40) a. [NP₁ (sukunakutomo) hutari-no gakusee]-ga [NP₂ (USC-no) sannin-no kyoozyu]-kara [NP₃ (Chomsky-ga kaita) nisatu-no hon]-o kariteita.
 '[NP₁ (at least) two students] borrowed from [NP₂ three professors (of USC)] [NP₃ two books (which Chomsky wrote)].'
 b. ^{YES}(DR<NP₃, NP₂> & DR<NP₃, NP₁>), but ^{NO}(DR<NP₁, NP₂> & DR<NP₃, NP₂>) (from (39a))
 c. ^{NO}(DR<NP₂, NP₁> & DR<NP₃, NP₁>) (from (39b))

On the other hand, under the covert movement analysis, we must stipulate, for example, (i) that covert movement must go over at least one S (for (39a)), and (ii) that only one NP undergoes covert movement (for (39b)). Hence we have further arguments for the Subject Predicate analysis of DR<NP_{cm}, NP_{nom}> in the basic order.

6. Concluding Remarks

In this paper I have argued that there are two ways of interpreting sentences: (i) solely on the basis of its LF representation (M-I), and (ii) through Subject Predication, which forms a Subject Predicate representation partially based upon its LF representation (M-II). M-I and M-II can both give rise to DR's; thus, two kinds of DR's. One of the significant implications of this paper is that if one wishes to probe into the nature of some LF properties on the basis of the availability of DR's, one must utilize the DR's derived by M-I, i.e., the DR's in the M-II free environments. I hope that the delinea-

¹⁷ We also need to stipulate that covert movement is sensitive to the availability of a categorical representation (see Section 4.3.2).

tion of the M-II free environments accomplished by this work could serve as a useful tool for the investigation of the formal properties of natural languages.

References

- Barwise, Jon, and Robin Cooper. 1981. Generalized Quantifiers and Natural Language. *Linguistics and Philosophy* 4.159-219.
- Hayashishita, J.-R. 1999. Two Ways of Deriving Distributive Readings. To appear in *Proceedings of the 23rd Annual Penn Linguistics Colloquium*. University of Pennsylvania.
- Hoji, Hajime. 1985. *Logical Form Constraints and Configurational Structures in Japanese*. Doctoral dissertation, University of Washington.
- Huang, C.-T. James. 1982. *Logical Relations in Chinese and the Theory of Grammar*. Doctoral dissertation, MIT.
- Kitagawa, Yoshihisa. 1990. Anti-Scrambling. Ms., University of Rochester. (A paper read at the Tilburg University Workshop on Scrambling, 10/19/90.)
- Kuno, Susumu, Ken-ichi Takami, and Yuru Wu. 1999. Quantifier Scope in English, Chinese, and Japanese. *Language* 75:1.63-111.
- Kuroda, S.-Y. 1969/70. Remarks on the Notion of subject with Reference to Words like Also, Even or Only. In *Annual Bulletin*. Research Institute of Logopedics and Phoniatics, University of Tokyo, vol.3.111-129, and vol.4.127-152.
- Kuroda, S.-Y. 1979. (Ko) So, A nituite (On (ko), so and a). In *Eigo to Nihongo to (English and Japanese)*. Kuroshio Syuppan: Tokyo. 41-59.
- Kuroda, S.-Y. 1992. Judgment Forms and Sentence Forms. In *Japanese Syntax and Semantics*. Kluwer Academic Publishers: Dordrecht. 13-77.
- Kuroda, S.-Y. 1994. Quantifier Scope in Japanese. Ms., University of California in San Diego.
- Liu, F-H. 1990. *Scope Dependency in English and Chinese*. Doctoral dissertation, University of California, Los Angeles.
- Reinhart, Tanya. 1976. *The Syntactic Domain of Anaphora*. Doctoral dissertation, MIT.
- Saito, Mamoru. 1992. Long Distance Scrambling in Japanese. *Journal of East Asian Linguistics*, 1-1.69-118.
- Takubo, Yukinori, and Satoshi Kinsui. 1997. Discourse Management in terms of Multiple Mental Spaces. *Journal of Pragmatics* 28.741-758.
- Ueyama, Ayumi. 1998. *Two Types of Dependency*. Doctoral dissertation, University of Southern California, distributed by GSIL publications, USC, Los Angeles.
- Yoshimura, Noriko. 1992. *Scrambling and Anaphora in Japanese*. Doctoral dissertation, University of Southern California.