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Falsifiability and Repeatability in Generative Grammar: A Case Study of Anaphora and Scope Dependency in Japanese*

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Abstract

This paper aims to illustrate how we might proceed to attain repeatability and falsifiability in generative grammar, on the basis of discussion of concrete empirical materials in Japanese, such as bound variable anaphora, quantifier scope, and reconstruction effects. After critically examining and improving on the major empirical arguments for the standard view of the phrase structure of Japanese, I propose that a certain type of bound variable anaphora is based on a formal relation, *Formal Dependency (FD)*, between two argument positions. The structural condition on FD and its interpretive consequence proposed here not only enable us to account for the fluctuation and instability of speakers' judgments but also lead us to predict a number of hitherto unnoticed correlations with regard to the (un)availability of a bound variable construal. The paper attains a significantly higher level of repeatability than before, states explicitly how its proposal can be falsified, and stresses the critical importance of making a rigorous attempt to articulate how every theoretical concept is related to the rest of the theory as well as to the native speaker's linguistic intuitions so as to be able to make definite predictions and ensure the falsifiability of our hypotheses.

Key Words: Bound variable anaphora (BVA), Falsifiability, Formal Dependency (FD), Judgmental fluctuation, Reconstruction effects, Repeatability

1. Introduction

If "the aim of science is, on the one hand, a comprehension, as *complete* as possible, of the connection between the sense experiences in their totality, and, on the other hand, the accomplishment of

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this aim *by the use of a minimum of primary concepts and relations*,"¹ as Einstein (1936:293) puts it, and if generative grammar is that part of science whose aim consists of a comprehension of the connection between the sense experiences as reflections of the language faculty, it follows that one of our tasks is to identify what the relevant sense experiences are; cf. Chomsky 1955/1975: 37. Since our sense experiences, such as introspective judgments about a given sentence in a given language, most likely reflect more than the language faculty proper, such a task necessarily involves hypotheses about the nature of the relevant sense experiences, in particular, hypotheses as to which aspects of our sense experiences under discussion are reflections of our grammar, and in what theoretical terms they are to be expressed. At a particular stage of theory construction, a given factor can be reasonably considered grammatical in nature only if it can be expressed in terms of concepts postulated within the grammatical theory being developed.² Every concept and relation postulated in the theory, in turn, must be tightly related to the native speaker's linguistic intuitions—often quite indirectly—as reflections of his/her grammar. It is in fact the tight connection between (i) theoretical concepts and relations on the one hand and (ii) the speaker's linguistic intuitions on the other that makes it possible to put forth definite predictions about the latter that are formulated in terms of the former, thereby making the proposed theory/hypothesis falsifiable.

This paper is concerned with how falsifiability and repeatability can be attained in generative grammar. I would like to start with an intuitive understanding of these notions as follows.³

- (1) a. A proposal α is *falsifiable* iff α makes a prediction that can be confirmed or disconfirmed.
- b. An outcome β of an experiment confirms a prediction γ iff β is in accordance with γ ; β disconfirms γ otherwise.
- c. *Repeatability* (or *reproducibility*) is attained to the extent that an outcome of an experiment that confirms the prediction is *repeated* (or *reproduced*).⁴

How these notions are to be understood in the context of generative grammar is the main concern of the present work, and what follows is an attempt to begin to answer this question, on the basis of discussion of concrete empirical materials in Japanese.

I consider in section 2 two empirical arguments put forth in the mid-1980s, and widely accepted to date, for the 'standard' view of the basic phrase structure of Japanese, which have to do with bound variable anaphora and quantifier scope. For each of the arguments, I point out that it suffers from serious repeatability problems, and try to strengthen it for the attainment of a higher degree of repeatability.⁵ In section 3, I argue that a particular theoretical characterization of bound variable anaphora, to be introduced there, not only broadens our empirical coverage but also deepens our understanding of what underlies the relevant linguistic intuitions, and enables us to predict new correlations with regard to the (un)availability of a bound variable construal. The falsifiability of the proposed account of BVA lies mostly in the

¹ The emphases are as in the original.

² Chomsky (1955/1975: 61) thus states that "a field of investigation cannot be clearly delimited in advance of the theory dealing with the subject matter; in fact, it is one of the functions of a theory to give such a precise delimitation."

³ For relevant discussion, see Popper 1959: sec. 6 and 45-46, for example.

⁴ *Repeatability*, understood in this way, can therefore be attained only in the context of an experiment; *repeatability* in the sense adopted here is therefore in principle independent of whether a uniform judgment obtains among speakers on a particular phonetic string or on a set of particular phonetic strings.

⁵ For reasons of space, we will only address the structural relation between *NP-ga* and *NP-o/ni* but the relevant arguments below seem to carry over to that between *NP-ni* and *NP-o* in the ditransitive construction; see footnote 45.

predicted correlations. In section 4 I address the issues of falsifiability and repeatability, and illustrate how our proposal can be falsified, drawing from the discussion in sections 2 and 3. In an attempt to further illustrate the significance of falsifiability and repeatability in generative grammar, I will in this section also present a critical discussion of the widely accepted assumption that *otagai* is a local anaphor. Concluding remarks are given in section 5.

2. Anaphora and Scope Dependency

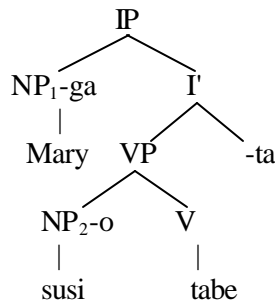
2.1. The basic phrase structure in Japanese

It is widely agreed in the generative tradition that the surface string that corresponds to NP_1 -ga NP_2 -o $V(-ta/-ru)$ in Japanese, exemplified in (2), is represented as NP_1 asymmetrically c-commanding NP_2 . (The use of *NP* instead of *DP* does not affect the discussion in this paper in any significant way.)

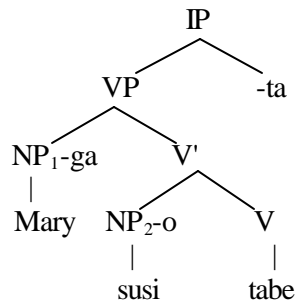
- (2) $[_{NP_1}$ Mary]-ga $[_{NP_2}$ susi]-o tabeta (koto)
 Mary-NOM sushi-ACC ate (fact)
 '(the fact that) Mary ate sushi'

According to this view, (2) must be represented, for example, as in (3a) or (3b) rather than as in (4a) or (4b).

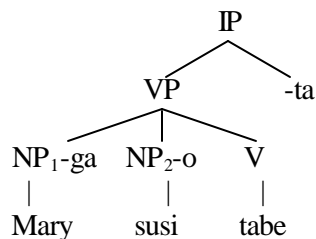
- (3) a.



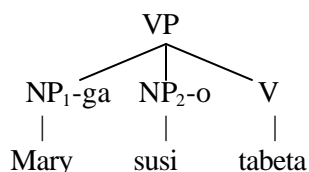
- b.



(4) a.



b.



Similarly, it is generally agreed that the surface string corresponding to NP_1 -ga NP_2 -ni NP_3 -o $V(-ta/-ru)$, such as *John-ga Mary-ni hon-o watasita* 'John handed a book to Mary', is represented as NP_2 asymmetrically c-commanding NP_3 . For ease of exposition, let us refer to this view as *ACH* (the asymmetrical c-command hypothesis).⁶

The conceptual arguments for ACH make recourse to the notion of compositional semantics and a particular conception of structure building as part of the generative procedure, e.g., *Merge* in Chomsky 1995. ACH is so widely accepted in the current generative field that one might find little point in addressing its validity now. I will, however, argue in what follows that serious reevaluation is needed of the empirical bases for ACH presented in the mid-1980s and accepted to date. The strongest empirical evidence in support of ACH—as far as I am aware—comes from the (un)availability of certain interpretive possibilities, regarding bound variable anaphora and quantifier scope, and I will address the relevant arguments in sections 2.2. and 2.3.⁷

⁶ ACH also holds that NP_1 asymmetrically c-commands NP_2 in a surface string that corresponds to NP_1 -ga NP_2 -ni $V(-ta/-ru)$, as in (i).

(i) $[_{NP1}$ Mary]-ga $[_{NP2}$ John]-ni iiyotta (koto)
Mary-NOM John-DAT approached
'Mary tried to seduce John'

⁷ It is argued in Whitman 1982, Saito 1983, 1985 and Hoji 1985 that Japanese exhibits the effects of so-called binding condition C/D, which is often claimed to be responsible for the status of (i), i.e., the (alleged) unavailability of the anaphoric relation between the two NPs in question; cf. (ii).

(i) **he* loves *John's* father
(ii) a. *John* loves *his* father
b. *his* father loves *John*

The relevant Japanese paradigms, found in Saito 1983: (4) and Hoji 1985: chap. 1, for example, were taken in the mid-1980s as another piece of empirical evidence for ACH. As discussed in Ueyama 1998: Appendix C, however, there are empirical as well as conceptual problems with condition C/D, and the argument for ACH based on the condition C/D-related observations is not as compelling as one might have been led to believe. The reader is referred to Ueyama 1998: Appendix C for the relevant discussion. Nakau's (1973: 44-48) argument for ACH on the basis of some observations of the *soo su* 'do so/do in that way' construction is challenged by Hinds (1973: 24) and Inoue (1976: 44), and it is not conclusive either.

2.2. The bound anaphora-based argument

2.2.1. The argument in the mid-1980s

It is generally understood that (5a) allows the reading in (5b), but (6a) does not allow the reading in (6b).

- (5) a. everyone [praised his son]
b. $\forall x, x = \text{a person}, x \text{ praised } x\text{'s son}$
- (6) a. his son [praised everyone]
b. $\forall x, x = \text{a person}, x\text{'s son praised } x$

The contrast between (5) and (6), which seems to obtain with a wide range of NPs in place of *everyone* and *his*, has been attributed to a condition such as (7) or (8).

- (7) The precedence requirement on bound variable anaphora:
An NP β can be construed as a variable bound by an NP α only if β is preceded by α .
- (8) The c-command requirement on bound variable anaphora:
An NP β can be construed as a variable bound by an NP α only if β is c-commanded by α .

Chomsky (1976: (105)) proposes a precedence-based condition on the availability of the bound variable construal for a pronoun that has the effect of (7), while Reinhart (1976, 1983) puts forth a c-command-based condition like (8).⁸

The empirical argument in the mid-1980s for ACH is based on (8), and paradigms such as (9) have been considered as evidence for ACH.⁹

- (9) a. (Hoji 1985: 114, (2b), slightly adapted)
daremo-ga [[*pro* hitome ec mita] hito]-o sukininata
everyone-NOM one:glance saw person-ACC fell:in:love
'everyone fell in love with the person whom *he/she* had glanced at'

⁸ Chomsky's (1976: (105)) condition covers not only the cases like (5) and (6) but also *wh*-questions. *Wh*-questions are not covered in the formulations of (7) and (8) to keep the discussion simple.

⁹ The acceptability judgments in (9) are as reported in Hoji 1985. A few more examples are supplied in (i) and (ii) below, with the judgments typically given on similar examples in the literature; see Hoji 1985: chap. 2, notes 26 and 27, chap. 3, note 3 and the text discussions thereabout.

- (i) a. *daremo-ga* [[*pro* ec butta] hito]-ni ayamatta (koto)
everyone-NOM hit person-DAT apologized
'everyone apologized to the person whom *he/she* had hit'
b. *daremo-ga* [[ec *pro* butta] hito]-o uttaeta (koto)
'everyone sued the person who had hit *him/her*'
c. *daremo-ga* [[ec mukasi *pro* osieta] hito]-o hometeiru (koto)
'everyone is praising the person who taught *him/her* a long time ago'
- (ii) a. *?[[ec *pro* butta] hito]-ga *daremo-ni* ayamatta (koto)
'the person who had hit *him/her* apologized to *everyone*'
b. *?[[*pro* ec butta] hito]-ga *daremo-o* uttaeta (koto)
'the person who *he/she* had hit sued *everyone*'
c. *?[[ec mukasi *pro* osieta] hito]-ga *daremo-o* hometeiru (koto)
'the person who taught *him/her* a long time ago is praising *everyone*'

- b. (Hoji 1985: 114, (2a), slightly adapted)
 *[[ec hitome *pro* mita] hito]-ga daremo-o sukininatta
 one:glance saw person-NOM everyone-ACC fell:in:love
 'the person who had glanced at *him/her* fell in love with *everyone*'

It is claimed in Hoji 1985 that (9a) readily allows the reading schematized in (10a) while (9b) does not allow the reading schematized in (10b).

- (10) a. $\forall x, x = \text{a person}, x \text{ Verb [the person who ... } x \text{ ...]}$
 b. $\forall x, x = \text{a person}, [\text{the person who ... } x \text{ ...}] \text{ Verb } x$

Once we accept (8), the contrast in (9) leads us to conclude that the subject NP (i.e., the *ga*-marked NP) asymmetrically c-commands the object NP (i.e., the *o*-marked NP), providing us with an argument for ACH. It must be noted, however, that the contrast indicated in (9) is compatible with either (7) or (8), just as in the case of English examples in (5) and (6). The contrast, therefore, leaves open the choice between (7) and (8), and it does not in and by itself constitute empirical evidence for ACH.

2.2.2. The low repeatability

Before discussing the precedence vs. c-command issue, we shall first observe that, despite the wide acceptance of the argument for ACH in the mid-1980s just reviewed, many speakers do not share the judgments that are expected under the proposed analysis and generalization. For example, many speakers find (9b) to be compatible with the situation in which for everyone under discussion it is the case that someone who had taken a glance at him/her fell in love with him/her. In this subsection, we will consider two factors that affect the speaker's judgment in question.

2.2.2.1. The so-called zero pronoun and *so-ko*

One factor that makes the intended contrast in (9) not so robust is the use of the so-called zero pronoun, represented here simply as *pro* purely for ease of exposition. Let us observe first that the contrast in (12) is not as clear as that in (11), due to the possibility of a group reading in (12); see footnote 14.

- (11) a. *everyone* talked to the person who *he* wanted to invite to the party
 b. *the person who wanted to invite *him* to the party talked to *everyone*
- (12) a. *everyone* talked to the person who *they* wanted to invite to the party
 b. ?the person who wanted to invite *them* to the party talked to *everyone*

Similarly, the anaphoric relation between the two italicized NPs appears to be possible in (13b) but not in (13a).

- (13) (Reinhart 1983: chap. 5, (17))
 a. *The guy who read *every book in the library* says that *it* is absolutely boring.
 b. The guy who read *every book in the library* says that *they* are absolutely boring.

We thus cannot seem to expect a clear contrast in the relevant paradigm if the 'dependent term' can be plural-denoting; see Reinhart 1983: 116-117 and the references there.

It seems that whether an expression can be plural-denoting can be determined on the basis of the

possibility of split antecedence. Consider the paradigm in (14) and (15), discussed in Hoji 1995.¹⁰

- (14) a. (Hoji 1995: 259, (16), slightly adapted)
 *Toyota₁-ga Nissan₂-ni [_{CP} zeimusyo-ga so-ko₁₊₂ -o sirabeteiru to] tugeta (koto)
 Toyota-NOM Nissan-DAT tax:office-NOM that-place-ACC is:investigating that informed (fact)
 'Toyota₁ informed Nissan₂ that the tax office was investigating it₁₊₂'
- b. *Toyota₁-wa Nissan₂-ni [_{NP} so-ko₁₊₂-no goodoopaatii-no kaizyoo]-o teiansita.
 Toyota-TOP Nissan-DAT that-place-GEN joint:party-GEN place-ACC suggested
 'Toyota₁ suggested to Nissan₂ (about) a place for its₁₊₂ joint party'
- (15) a. Tom₁-ga Nick₂-ni [_{CP} CIA-ga karera₁₊₂-o sirabeteiru to] tugeta (koto)
 Tom-NOM Nick-DAT CIA-NOM they-ACC is:investigating that informed (fact)
 'Tom₁ told Nick₂ that the CIA was investigating them₁₊₂'
- b. A-no ninensei₁-wa a-no itinensei₂-ni aitura₁₊₂-no atarasii kooti-o syookaisita.
 That-GEN sophomore-TOP that-GEN freshman-DAT they-GEN new coach-ACC introduced

¹⁰ As indicated in (i), *so* in *so-ko* is a demonstrative prefix.

- (i) a. *ko-ko* 'here' 'this place'
 b. *so-ko* 'there' 'that place'
 c. *a-soko* 'there' 'that place'
 d. *do-ko* 'where' 'which place'

(According to Satoshi Kinsui (personal communication, August, 1997), *so* in *a-soko* comes from *si* in *a-siko* that appeared in the Tyuuko period (A.D. 794-1192), and is unrelated to the demonstrative prefix *so*-.) As described by Sakuma (1936), Japanese possesses a productive system of deictics, the so-called *ko*, *so*, *a*, *do* paradigms. The chart in (ii) is taken from Kinsui 1997:sec. 2.1, with slight adaptation.

(ii) Japanese Demonstrative Paradigms (Kinsui (1997: sec. 2.1))

	Proximal	neutral	distal	indefinite
Nominals	ko-re 'this thing'	so-re	a-re	do-re
	ko-tira	so-tira	a-tira	do-tira
	ko-tti	so-tti	a-tti	do-tti
	ko-ko 'this place'	so-ko	a-soko	do-ko
	ko-itu 'this guy'	so-itu	a-itu	do-itu
Prenominal modifiers	ko-nna 'this kind'	so-nna	a-nna	do-nna
	ko-no 'this'	so-no	a-no	do-no
Adverbials	ko-o	so-o	a-a	do-o

As suggested in Kuroda 1965: 105, Japanese does not have overt forms that correspond directly to English personal pronouns, in a way that is meaningful to grammatical studies. The nominal forms as well as those with a prenominal modifier form such as *ko/so/a-no hito* 'this/that/that person' are used—along with the so-called zero pronoun—in place of (third person) pronouns in English, as observed in Martin 1975/1987: 1074; cf. also Sakuma 1951/1983: 22 and Kuno 1978: 127. *Ko/so/a*-NPs have the non-deictic use as well as the deictic use, so to speak; e.g., they can be used either in the context where the object being referred to is visible in the speech location or in a context where it is not. The properties of these NPs, especially those of *so/a*-NPs, have been extensively studied in the past literature, including Kuno 1973: chap. 24, Kuroda 1979, and the references in Kinsui & Takubo 1992. Ueyama's (1998) theory of anaphoric relations is based on a close examination of the syntactic as well as semantic properties of these NPs. Hoji et al. 1999 offers a refinement of Ueyama's theory, in the context of addressing reconstruction effects. Hoji et al. to appear extends Ueyama's theory not only to *ko*-NPs but also to the deictic uses of these NPs.

'That sophomore₁ introduced to that freshman₂ their₁₊₂ new coach.'

- c. A-no ninensei₁-wa a-no itinensei₂-ni [kooti-ga aitura₁₊₂-o mihatteiru koto]-o morasitesimatta.
 that_{GEN} sophomore-TOP that_{GEN} freshman-DAT coach-NOM they-ACC is:watching fact -ACC revealed

'That sophomore₁ revealed to that freshman₂ that the coach was watching them₁₊₂ (from somewhere).'

- d. A-no ninensei₁-wa a-no itinensei₂-ni [kooti-ga soitura₁₊₂-o mihatteiru koto]-o morasitesimatta.
 that_{GEN} sophomore-TOP that_{GEN} freshman-DAT coach-NOM they-GEN is:watching fact -ACC revealed

'That sophomore₁ revealed to that freshman₂ that the coach was watching them₁₊₂ (from somewhere).'

The split antecedence is not possible in (14), in contrast to (15). As pointed out in Hoji 1995, this observation can be accounted for if *so-ko* 'that place', used in (14), is understood to be singular-denoting, in contrast to *karera* 'they', *aitura* 'those guys', and *soitura* 'those guys', used in (15).

When we turn our attention to *pro*, we will observe that *pro* seems to allow for split antecedence, in sharp contrast with *so-ko*.¹¹

- (16) a. Toyota₁-ga Nissan₂-ni [CP zeimusyo-ga *pro*₁₊₂ sirabeteiru to] tugeta (koto)
 Toyota-NOM Nissan-DAT tax:office-NOM is:investigating that informed (fact)

'Toyota₁ informed Nissan₂ that the tax office was investigating them₁₊₂'

- b. Toyota₁-wa Nissan₂-ni [NP *pro*₁₊₂ goodoopaatii-no kaizyoo]-o teiansita.
 Toyota-TOP Nissan-DAT joint:party-GEN place-ACC suggested

'Toyota₁ suggested to Nissan₂ (about) a place for their₁₊₂ joint party.'

This indicates that *pro* can be plural-denoting. If *pro* can be plural-denoting, it is possible that the Japanese examples in (9) correspond to the English examples in (12), rather than to those in (11), in the relevant respects. Hence the somewhat unclear status of the intended contrast (for many speakers) between (9a) and (9b) is not unexpected; see footnote 14.

Given that *so-ko* 'that place' is singular-denoting, as indicated in (14), we expect that the contrast in question will be clearer with *so-ko* than with *pro*. Such indeed seems to be the case. Consider first the examples in (17).

- (17) a. (Hoji 1995: (17)), slightly adapted)
 Toyota to Nissan-ga John-ni [CP CIA-ga *so-ko*-o sirabeteiru to] tugeta (koto)
 Toyota and Nissan-NOM John-DAT CIA-NOM that-place-ACC is:investigating that told

'each of Toyota and Nissan informed John that the CIA was investigating it'

- b. Toyota to Nissan-ga *so-ko*-no torihikisaki-o uttaeta (koto)
 Toyota and Nissan-NOM that-place-GEN business:associate-ACC sued

'each of Toyota and Nissan sued its business associate(s)'

¹¹ As noted above, the use of *pro* in the present discussion is only for exposition. It is intended to stand simply for an empty nominal expression, and not for a category that is said to have formal properties associated with the [+pronominal] and [-anaphoric] features in the binding theoretic sense; see footnote 85.

So-ko can be anaphorically related to *Toyota to Nissan* 'Toyota and Nissan'.¹² It is argued in Hoji 1995 that the relevant readings of (17a) and (17b), for example, are as in (18a) and (18b), respectively.

- (18) a. x , x is a member of {Toyota, Nissan}, x told John that [the CIA was investigating x]
 b. x , x is a member of {Toyota, Nissan}, x sued x 's business associates

The 'bound variable use' of *so-ko* can be observed with a wide range of 'quantificational NPs, and a few such examples are provided in (19) and (20).¹³

- (19) a. *kanarinokazu-no zidoosyagaisya-ga sinbunsizyoo-de* [_{CP} *so-ko-ga* FBI-ni siraberareta to]
 a:good:number-GEN auto:company-NOM newspaper-on that-place-NOM FBI-by was:searched that
 happyoosita
 announced
 'a good number of auto companies announced on the newspaper that it had been searched by the FBI'
- b. *kanarinokazu-no hudoosanya-ga so-ko-no raibaru-o hihansita*
 a:good:number-GEN real:estate:company-NOM that-place-GEN rival:company-ACC criticized
 'a good number of real estate companies criticized its rival (company/companies)'
- (20) a. *John-ga subete-no zidoosyagaisya-ni* [_{CP} *CIA-ga so-ko-o* sirabeteiru to] tutaeta
 John-NOM all-GEN auto:company-DAT CIA-NOM that-place-ACC is:investigating that informed
 'John informed all the auto companies that the CIA was investigating it'
- b. *subete-no zidoosyagaisya-ga* [[_{ec} *so-ko-o* hihansita kaisya]]-ni koogisita
 all-GEN auto:company-NOM that-place-ACC criticized company-DAT protested
 'all the auto companies protested to the company that had criticized it'

Now consider (21)-(23).

- (21) a. (= (17b))
Toyota to Nissan-ga so-ko-no torihikisaki-o uttaeta
 Toyota and Nissan-NOM that-place-GEN business:associate-ACC sued
 'each of Toyota and Nissan sued its business associate(s)'
- b. **?so-ko-no torihikisaki-ga Toyota to Nissan-o uttaeta*
 that-place-GEN business:associate-NOM Toyota and Nissan-ACC sued
 'its business associate(s) sued each of Toyota and Nissan'

¹² That *so-ko* 'that place' and other *so*-series demonstrative NPs can function as a bound variable has been noted in Nishigauchi 1986 and Yoshimura 1987, among other places, and further discussed in subsequent works such as Hoji 1990, 1991, 1995, Ueyama 1998, Hoji et al. 1999, to appear.

¹³ The more appropriate English translation of *so-ko* in (19) would be plural *they* rather than singular *it*. The latter is chosen in this and other examples below to remind the reader of *so-ko*'s singular-denoting property.

- (22) a. (=19b))
kanarinokazu-no hudoosanya-ga so-ko-no raibaru-o hihansita
 a:good:number-GEN real:estate:company-NOM that-place-GEN rival:company-ACC criticized
 'a good number of real estate companies criticized its rival (company/companies)'
- b. *?*so-ko-no raibaru-ga kanarinokazu-no hudoosanya-o hihansita*
 that-place-GEN rival-NOM a:good:number-GEN real:estate:company-ACC criticized
 'its rival (company/companies) criticized a good number of real estate companies'
- (23) a. (=20b))
subete-no zidoosyagaisya-ga [[ec so-ko-o hihansita kaisya]]-ni koogisita
 all-GEN auto:company-NOM that-place-ACC criticized company-DAT protested
 'all the auto companies protested to the company that had criticized it'
- b. *?[[ec so-ko-o hihansita kaisya]]-ga *subete-no zidoosyagaisya-ni ayamatta*
 that-place-ACC criticized company-NOM all-GEN auto:company-DAT apologized
 'the company that had criticized it apologized to all the auto companies'

The contrast indeed seems clearer in the paradigms in (21)-(23) than in those involving *pro*, such as (9). If we replace *so-ko* in (23) by *pro*, the contrast seems to become less clear, as expected, although the relevant examples with *pro* are not supplied here for space reasons.¹⁴

2.2.2.2. Bound variable construal that seems independent of a structural condition

Although the use of a singular-denoting *so*-NP eliminates the complication that arises from the possibility of a group reading of *pro*, we still face some problems if we use certain 'quantificational' NPs such as *daremo* 'everyone' and *subete-no NP* 'every NP'. Ueyama (1998) observes that examples like (24) appear to allow for the bound variable construal for *so-ko*.¹⁵

- (24) (Ueyama 1998: 213, (80))
- a. ?*So-ko-no bengosi-ga Toyota to Nissan-o suisensita*
 that-place-GEN attorney-NOM Toyota and Nissan-ACC recommended
 (node, ato-wa dareka-ni Mazda-o suisensite-mora(w)-eba ii dake da).
 because rest-TOP someone-DAT Mazda-ACC recommend-ask-if good only COPULA
 '(Since) {its/a retained} attorney recommended Toyota and Nissan (, now we have only to ask someone to recommend Mazda).'

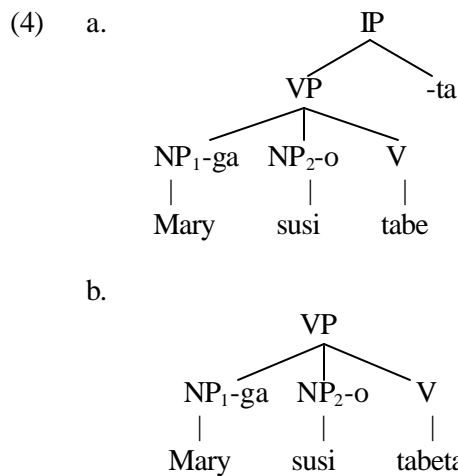
¹⁴ One might suggest that the intended contrast in (9) (and also in English (12)) does reflect the relevant property of the language faculty, maintaining that the contrast becomes clearer if we try to focus on the distributive reading of the sort indicated in (5b) and (6b), instead of the group reading; see Partee 1978: 81. This might in fact be the case, and such an attempt may be necessary at certain stages of our research. However, it must be recognized that the crucial reliance upon the speaker's ability to differentiate between the distributive reading and the group reading *for the same morphological form* is likely to give rise to some judgmental instability, thereby making it difficult to ensure a high level of repeatability.

¹⁵ As noted in Ueyama 1998: Appendix D.3, we seem to observe essentially the same phenomenon in English as well, although space limitation prevents me from providing the relevant discussion here; cf. Pica & Snyder 1994 for relevant discussion.

- b. [?]*So-ko-no bengosi-ga subete-no zidoosya-gaisya-o*
 thatplace-GEN attorney-NOM every-GEN automobile-company-ACC
 uttaeteiru (node, zidoosya-gyookai-wa daikonran-ni otiitteiru).
 sued because automobile-industry-TOP disorder-DAT be:thrown:into
 '(Since) {its/a retained} attorney has sued every automobile company (, the automobile industry has been thrown into a state of disorder).'

The relevant structural relation between *so-ko* and 'its antecedent' in (24) is identical to that in (21b), (22b), and (23b). The relatively acceptable status of examples like (24) for some (or possibly many) speakers naturally makes one wonder how clearly unavailable the relevant reading really is in the (b) examples in (21)-(23). As it turns out, speakers find examples like (21b), (22b), and (23b) acceptable with the relevant construal, to varying degrees; some speakers find it readily available, and some find it marginally available while others find it unavailable.

One might suggest that the status of (24) can be accounted for under (8) if we assume that *NP-o* c-commands *NP-ga* in (24). Notice that, under this suggestion, we would have to also allow *NP-ga* to c-command *NP-o* in *NP-ga NP-o V*, given the earlier observation that the bound variable construal seems also available in *QP-ga [... so-ko ...]-o V*.¹⁶ In other words, one might take the status of (24) as evidence for the structure as indicated in (4), repeated here, in which the 'subject' and the 'object' c-command each other.



Such an account, however, would leave it unexplained why the relevant reading is much more readily available in (25a) than in (25b).

- (25) a. *QP-ga [... so-ko ...]-o Verb*
 b. *[... so-ko ...]-ga QP-o Verb*

It is observed in Ueyama 1998: Appendix D.2 that non-syntactic factors affect the availability of the relevant interpretation in (25b), but not in (25a).¹⁷ Let us consider the factor whose effects we can

¹⁶ What is meant by a *QP* here is a 'binder' in question and it is not meant to stand for a *quantifier* in the standard sense.

¹⁷ The two factors that are clearly non-grammatical are given in (i).

observe most clearly, without having to invoke structural complexity. In order for the relevant interpretation to be available in (25b), what is represented as a QP in (25b) must 'refer' to a specific group of entities. *Toyota to Nissan* 'Toyota and Nissan' can certainly be used to refer to two specific companies and *subete-no zidoosyagaisya* 'all automobile companies' can be used to refer to the entire group of auto companies under discussion; cf. (24). Ueyama observes that examples such as (26) are highly marginal to impossible, in contrast to (24), with the intended interpretations, and attributes that to the (near) impossibility of NPs such as *A ka B ka* 'either A or B,' *55%-no NP* '55% of NP,' and *John-sae* 'even John' to be used to refer to a specific group of entities.

(26) (Ueyama 1998: 213, (82))

- a. *?*So-ko-no bengosi-ga Toyota ka Nissan ka-o suisensita*
 that-place-GEN attorney-NOM Toyota or Nissan or-ACC recommended

(node, *ato-wa dareka-ni Mazda-o suisensite-mora(w)-eba ii dake da*).
 because rest-TOP someone-DAT Mazda-ACC recommend-ask-if good only COPULA

'(Since) *{its/a retained}* attorney recommended *either Toyota or Nissan* (, now we have only to ask someone to recommend Mazda).'

- b. *?*So-ko-no bengosi-ga 55%-no zidoosya-gaisya-o*
 that-place-GEN attorney-NOM 55%-GEN automobile-company-ACC

uttaeteiru (node, *zidoosya-gyookai-wa daikonran-ni otiitteiru*).
 sued because automobile-industry-TOP disorder-DAT be:thrown:into

'(Since) *{its/a retained}* attorney has sued *55% of the automobile companies* (, the automobile industry has been thrown into a state of disorder).'

It is important to recognize that the lexico-semantic properties of an NP α alone do not determine whether and with what facility α can be used to refer to a specific group of entities in the sense relevant here, as pointed out in Hayashishita forthcoming: chap. 2. For example, while the unavailability of the relevant interpretation in examples such as (27) below is fairly clear, the acceptability of examples like (26b) and (22b) above, with the intended interpretations, seems to vary a great deal, being affected by the pragmatic context in which they are used (and presumably by the speaker's perception of the relevant situation as well).¹⁸

(i) (Ueyama 1998: 214, (81a) and (81d))

- a. The apparent QP must 'refer' to a specific group of individuals.
 b. The apparent QP must be in a position which is salient enough to be a 'topic' of a sentence.

It is illustrated in Ueyama 1998: 219, (95) that the choice of the predicate affects the 'salience' in (i-b). While a structural factor also affects the availability of the interpretation in question (see Ueyama 1998: 214, (81b)), the relevant factor does not make reference to the structural relation between the 'binder' and the 'bindee', c-command or precedence. For this reason, I will sometimes refer to the construal under discussion as being not structurally based.

¹⁸ The clear unavailability of the BVA in (27b) indicates that *zidoosyagaisya-o 6-sya* 'auto:company-ACC 6-CL' cannot be used to refer to a specific group of entities. This is in conformity with the observation in Downing 1993, on the basis of her textual analysis, that the NP-CM numeral-CL sequence is used only in situations where the quantitative information it carries is new to the discourse. For discussion on (floating) numeral quantifiers in Japanese and various syntactic structures in which they occur, see Shibatani 1977, Inoue 1978: 4.3 Kamio 1977, 1983, and Miyagawa 1989: chap. 2. The discussion of the NP-CM numeral-CL combination in Kitagawa & Kuroda 1992: sec. 3, sec. 5.2.1, Appendix 1 and Ishii 1998 indicates that the descriptive generalizations proposed in the earlier works need to be sharpened considerably.

- (27) (Cf. (26).)
- a. **So-ko-no* bengosi-ga *Toyota-sae-o* uttaeteiru
 that-place-GEN attorney-NOM Toyota-even-ACC sued
 (node, *zidoosya-gyookai-wa* daikonran-ni otiitteiru).
 because automobile-industry-TOP disorder-DAT be:thrown:into
 '(Since) {*its/a retained*} attorney has sued *even Toyota* (, the automobile industry has been thrown into a state of disorder).'
- b. **So-ko-no* bengosi-ga *zidoosya-gaisya-o* 6-sya¹⁹
 that-place-GEN attorney-NOM automobile-company-ACC 6-CL
 uttaeteiru (node, *zidoosya-gyookai-wa* daikonran-ni otiitteiru).
 sued because automobile-industry-TOP disorder-DAT be:thrown:into
 '(Since) {*its/a retained*} attorney has sued *6 automobile companies* (, the automobile industry has been thrown into a state of disorder).'

Let us refer to the interpretation of the sort under discussion as *BVA* for ease of exposition, bearing in mind that it is not meant to be a theoretical concept but a descriptive term for the speaker's intuition in question. The availability of the *BVA* in (25b), repeated here, is affected by pragmatic factors and the relevant judgment is not very stable; see footnote 17.

- (25) a. *QP-ga* [... *so-ko* ...]-o Verb
 b. [... *so-ko* ...]-ga *QP-o* Verb

This sharply contrasts with the availability of the *BVA* in (25a), which is not affected by the pragmatic considerations of the sort noted above (although it is not totally immune to judgmental fluctuation, as will be discussed directly). Thus all the NPs discussed above, including those in (27), can 'yield' *BVA* in the configuration of (25a), as in (28) and (29), irrespective of the choice of the predicate and of the pragmatic context, which seems to affect the availability of the *BVA* in (25b); cf. footnote 17.

- (28) a. *Toyota-sae-ga so-ko-no sitaukegaisya-o* {uttaeteiru/suisensita/tubusita/ooensiteiru}.
 Toyota even-NOM that-place-GEN subsidiary-ACC is:suing/recommended/shut:down/is:rooting:for
 '*Even Toyota* {is suing/recommended/shut down/is rooting for} *its* subsidiaries.'
- b. *Toyota-sae-ga so-ko-no sitaukegaisya-ni* ayamatta.
 Toyota even-NOM that-place-GEN subsidiary-DAT apologized
 '*Even Toyota* apologized to *its* subsidiaries.'

¹⁹ *CL* stands for a classifier. I will leave open whether the NP-CM numeral-CL combination such as *zidoosyagaisya-o 6-sya* in (27b) can or must form a constituent. Kamio (1977, 1983) presents arguments for the thesis that they can, and Koizumi 1999: 3.5, 2000 challenges the validity of Kamio's arguments; Kawazoe 2002 on the other hand argues against Koizumi 2000 and presents evidence in support of Kamio's claim. Ishii 1998 proposes that the NP-CM numeral-CL combination is structurally ambiguous in that the numeral-CL can be generated as a VP modifier or as part of [_{NP} NP-CM numeral-CL]. The unavailability of the *BVA* in (27b) suggests that the 'specific reading' in question would be unavailable with either structure proposed in Ishii 1998. The readers are referred to Ishii 1998 for further discussion and a list of references on the past works on this topic; see footnote 18.

c. *Toyota-sae-ga so-ko-no sitaukegaisya-to arasotteiru.*
 Toyota even-NOM that-place-GEN subsidiary-with is:having:a:dispute

'*Even Toyota is having a dispute with its subsidiaries.*'

(29) a. *Zidoosyagaisya-ga 6-sya so-ko-no sitaukegaisya-o*
 auto:company-NOM 6-CL that-place-GEN subsidiary-ACC

{*uttaeteiru/suisensita/tubusita/ooensiteiru*}.
 is:suing/recommended/shut:down/is:rooting:for

'*Six auto companies {are suing/recommended/shut down/are rooting for} its subsidiaries.*'

b. *Zidoosyagaisya-ga 6-sya so-ko-no sitaukegaisya-ni ayamatta.*
 auto:company-NOM 6-CL that-place-GEN subsidiary-DAT apologized

'*Six auto companies apologized to its subsidiaries.*'

c. *Zidoosyagaisya-ga 6-sya so-ko-no sitaukegaisya-to arasotteiru.*
 auto:company-NOM 6-CL that-place-GEN subsidiary-with is:having:a:dispute

'*Six auto companies are having a dispute with its subsidiaries.*'

It thus seems reasonable to conclude that the BVA in (25a) is, or at least can be, based on a relation that gets established/licensed by some structural condition, but the BVA in (25b) is not. The nature of the BVA in (25b) is not (yet) fully understood. To the extent that its availability is not contingent upon the structural relation between the 'binder' and the 'bindee', however, it is possible, although not necessary, for the BVA in (25a) to be of the same type as that in (25b)—even though what is represented as QP in (25a) does c-command and precede *so-ko*—as long as it can be used to refer to a specific group of entities. This leads us to conclude that we should avoid using a certain type of QPs, i.e., the ones that can be used to refer to a specific group of entities, as the 'binder' in our experiments for the investigation of the properties of the language faculty that are sensitive to c-command.²⁰

2.2.3. Precedence vs. c-command

We have concluded that the BVA in (30) must be based on some structural condition.

(30) a. (=28b))
Toyota-sae-ga so-ko-no sitaukegaisya-ni ayamatta.
 Toyota even-NOM that-place-GEN subsidiary-DAT apologized

'*Even Toyota apologized to its subsidiaries.*'

b. (=29c))
Zidoosyagaisya-ga 6-sya so-ko-no sitaukegaisya-to arasotteiru.
 auto:company-NOM 6-CL that-place-GEN subsidiary-with is:having:a:dispute

'*Six auto companies are having a dispute with its subsidiaries.*'

The use of *so-ko* 'that place' in (30) avoids the problem that is due to the possibility of a group reading. Furthermore, the 'QPs' in (30) are among those that do not seem to allow the BVA without satisfying a structural condition in regard to the 'binder' and the 'bindee'. As expected, the contrast between (30) and

²⁰ The QPs in question can be used if we invoke certain complexity in our experiments, such as 'multiple scrambling'; see footnote 86.

(31) is clearer than most other pairs that have been considered in the literature in regard to the (un)availability of BVA.

(31) (adapted from (27))

- a. **so-ko-no* bengosi-ga *Toyota-sae-o* uttaeteiru
 that-place-GEN attorney-NOM Toyota-even-ACC sued
 '{*its/a retained*} attorney has sued *even Toyota*'
- b. **so-ko-no* bengosi-ga *zidoosya-gaisya-o* 6-sya uttaeta
 that-place-GEN attorney-NOM automobile-company-ACC 6-CL sued
 '{*its/a retained*} attorney has sued *six automobile companies*'

Let us schematize the contrast in (32), restricting our attention to the QP of the sort under discussion, i.e., those that do not 'give rise to' the BVA in (32b).

- (32) a. *QP-ga* [... *so-ko* ...]-o Verb (e.g., (30))
 b. *[... *so-ko* ...]-ga *QP-o* Verb (e.g., (31))

Note that in (32a) the QP not only c-commands but also precedes *so-ko*, regardless of the choice between the syntactic analyses of the structure in question (see (3) and (4)). Hence the availability of the BVA in (30) can be accounted for either by the precedence-based condition in (7) or by the c-command-based condition in (8). (7) and (8) are repeated here for convenience.

- (7) The precedence requirement on bound variable anaphora:
 An NP β can be construed as a variable bound by an NP α only if β is preceded by α .
- (8) The c-command requirement on bound variable anaphora:
 An NP β can be construed as a variable bound by an NP α only if β is c-commanded by α .

If we adopt ACH, the QP fails to c-command *so-ko* in (32b), thus making it possible to attribute the contrast in (32) to (8). It is however also possible to account for the contrast in (32) without adopting ACH if we accept (7) since the QP precedes *so-ko* in (32a) but fails to do so in (32b).

In order to argue for ACH on the basis of the (un)availability of BVA, it is therefore crucial to identify the BVA that *must* be based on c-command. In this subsection, I will strengthen the argument for ACH by identifying the BVA that *must* be based on c-command, drawing from Ueyama 1998, 2002.

Consider the examples in (33) and (34).

- (33) a. *Metu-sae-ga so-ko-no* kantoku-o uttaeta (koto)
 Mets even-NOM that-place-GEN manager-ACC sued (fact)
 '*even the Mets* sued *its* manager'
- b. **so-ko-no* kantoku-ga *Metu-sae-o* uttaeta (koto)
 that-place-GEN manager-NOM Mets even-ACC sued (fact)
 '*its* manager sued *even the Mets*'
- (34) a. *do-no kyuudan-mo so-no kyuudan-no* kantoku-o uttaeta (koto)
 which-GEN baseball:club-also that-GEN baseball:club-GEN manager-ACC sued (fact)
 '*every (baseball) team* sued *that (baseball) team's* manager'

- b. **so-no kyuudan-no kantoku-ga do-no kyuudan(-o)-mo uttaeta (koto)*
 that-GEN baseball:club-GEN manager-NOM which-GEN baseball:club(-ACC)-also sued (fact)
'that (baseball) team's manager sued every manager'

As indicated, the contrast in (33) seems to be duplicated in (34). One might thus suspect that the BVA in (33a) is no different in nature from that in (34a). The examination of reconstruction effects, however, points to a different conclusion.

Consider (35).²¹

- (35) a. *so-ko-no kantoku-o Mettu-sae-ga uttaeta (koto)*
 that-place-GEN manager-ACC Mets even-NOM sued (fact)
'its manager, even the Mets sued'
- b. **so-no kyuudan-no kantoku-o do-no kyuudan-mo uttaeta (koto)*
 that-GEN baseball:club-GEN manager-ACC which-GEN baseball:club-also sued (fact)
'that (baseball) team's manager, every (baseball) team sued'

While the BVA seems available in (35a), much as in the case of (33a), the BVA in (35b) seems quite marginal, in sharp contrast to (34a).²²

Reconstruction effects in examples like (35a) are as expected if we assume that the *NP-o NP-ga* order can be derived by a PF movement of *NP-o* from its theta position, as suggested in Hayashishita 2000: sec. 3.²³ According to this view, the LF representation of (35a) can be identical to that of (33a), in which *so-ko* is c-commanded at LF by *Mettu-sae* 'even the Mets' (and its trace, once it undergoes Quantifier Raising (QR)), as schematized in (36), provided that *NP-ga* c-commands *NP-o* in *NP-ga NP-o V*.²⁴ (Case-markers are suppressed in (36).)

- (36) The schematic LF representation under discussion for both (33a) and (35a):
 [*NP-sae* [*t* [... *so-ko* ...]]]

Let us articulate (8), as in (37), so as to make it clear that the relevant level is LF.

- (37) (=8), slightly modified)
 The c-command requirement on bound variable anaphora:

²¹ The examples in (35) do not form a minimal pair, and that is intended, as will be made clear in the discussion below.

²² The unavailability of BVA in examples like (35b) is discussed in Kuno & Kim 1994: 24, (5.9b) and Ueyama 1998: section 3.2.4.

²³ The claim that Scrambling is a stylistic rule and never affects the formal meaning of a sentence is made in Ross 1967: 51 for Latin and adopted in Inoue 1976: 232-233 and McCawley 1976: 59 for Japanese; cf. Saito 1989: 194 and Ueyama 2002: footnote 19.

²⁴ Alternatively, one might assume that the relevant movement is in overt syntax and the reconstruction effects are due to movement leaving a copy behind, as in Chomsky's (1993) copy theory of movement. As far as I can tell, the choice between the two alternatives is conceptual rather than empirical in nature, insofar as we limit our discussion to the questions addressed in this paper.

An NP β can be construed as a variable bound by an NP α only if β is c-commanded by α and its trace at LF.

Turning our attention to (35b), once we adopt the PF movement analysis of (35a), there is no reason not to assume that the surface order (*NP-cm NP-ga V*) in (35b) can be derived also by PF movement of the object NP, just as in the case of (35a). Thus, the LF representation schematized in (38) should be possible not only for (34a) but also for (35b).²⁵

(38) The schematic LF representation under discussion for both (34a) and (35b):
 [*do-no NP-mo* [*t* [... *so-no NP* ...]]]

Since *so-no kyuudan* 'that baseball team' is c-commanded by *do-no kyuudan-mo* 'every baseball team' (and its trace, once it undergoes QR), the condition in (37) is satisfied in (38), and hence for (35b) as well as (34a). If the BVA in (34a) were based on LF c-command, the unavailability of the BVA in (35b), in contrast to (35a), would thus be quite unexpected. This leads us to hypothesize that the BVA in (33a) and (34a) are not of the same type.²⁶ I repeat (33a) and (34a) for convenience.

(33a) *Metu-sae-ga so-ko-no kantoku-o uttaeta* (koto)
 Mets even-NOM that-place-GEN manager-ACC sued (fact)
 'even the Mets sued its manager'

(34a) *do-no kyuudan-mo so-no kyuudan-no kantoku-o uttaeta* (koto)
 which-GEN baseball:club-also that-GEN baseball:club-GEN manager-ACC sued (fact)
 'every (baseball) team sued that (baseball) team's manager'

The observations in (33), (34) and especially (35) suggest (39).

- (39) a. The BVA involving *NP-sae* 'even NP' and *so-ko* 'it/that place' can be based on LF c-command.
 b. The BVA involving *do-no NP* 'which NP' and *so-no NP* 'that NP' cannot be based on LF c-command.

Suppose that, as argued in Ueyama 1998, 2002, (i) there are two types of BVA—leaving aside the BVA characterized in footnote 17—and (ii) one is constrained as in (37) above, and the other, roughly speaking, as in (40) below.²⁷

²⁵ I continue to suppress case-markers in (38). I assume the absence of *ga* in *do-no kyuudan-mo* 'every baseball team' in (34a) and (35b) to be due to the ban on the sequence of *ga-mo* (and *ga-wa*) (as observed in Matsushita 1930/1977: 338), and *do-no kyuudan-mo* in (34a) and (35b) is treated as an instance of *NP-ga* 'NP-NOM' in the schematic structures under discussion.

²⁶ Notice that the unavailability of the BVA in (34b) suggests that the BVA in (34a) cannot be an instance of BVA that is not contingent upon the structural relation between the 'binder' and the 'bindee'.

²⁷ Ueyama's (1998) theory, which treats the second type of BVA as an instance of an E-type link, does not contain a precedence-based condition on BVA, as formulated in (40). Given that this type of BVA is not based on a relation that is established or licensed in the grammar, as stated in section 2.1, the text discussion might be misleading, but it is presented as such for want of a better alternative in regard to the exposition within the confines of the present discussion. For this reason, I will add *in effect* in the appropriate places in the ensuing discussion in an attempt to minimize the confusion.

- (40) (=7), slightly modified)
 The precedence requirement on bound variable anaphora:
 An NP β can be construed as a variable bound by an NP α only if β is preceded by α at PF.

For ease of exposition, I will henceforth use $BVA(A, B)$ to refer to the bound variable construal involving A as the 'binder' and B as the 'dependent term'. The observations in (33)-(35) lead us to conclude that BVA (*do-no NP*, *so-no NP*) is sensitive to, and must in effect be based on, PF precedence. Given this, we expect (41) and predict (42).

- (41) If the *QP* is of the *do-no NP* type, $BVA(QP, so-no NP)$ may be available in:
 [... *QP* ...]-ga [... *so-no NP* ...]-ni/o V
- (42) If the *QP* is of the *do-no NP* type, $BVA(QP, so-no NP)$ is not available in:
 [... *so-no NP* ...]-ni/o [... *QP* ...]-ga V

The availability of the BVA in (43) is as expected;

- (43) [ko-no mura-kara *do-no kaisya-ni* haitta hito]-ga *so-no kaisya-no*
 this-GEN village-from which-GEN company-to joined person-NOM that-GEN company-GEN
 syatyoo-o hihansitemo mondai-ni naru daroo.
 president-ACC criticize:if problem-to become perhaps
 (Roughly) 'No matter which x , x = a company, if [someone from this village who has joined x] criticizes x 's president, a big problem will ensue.'

The prediction in (42) seems to be confirmed by the observation in (44), to be contrasted with (43).

- (44) **so-no kaisya-no* syatyoo-o [ko-no mura-kara *do-no kaisya-ni* haitta hito]-ga
 that-GEN company-GEN president-ACC this-GEN village-from which-GEN company-DAT joined person-NOM
 hihansitemo mondai-ni naru daroo.
 criticize:if problem-DAT become perhaps
 (Roughly) 'No matter which x , x = a company, if [someone from this village who has joined x] criticizes x 's president, a big problem will ensue.'

In the conditional clause in (44), the *NP-ga NP-o* order in (43) is altered to the *NP-o NP-ga* order. As indicated, we do not observe reconstruction effects in (44).

Let us now consider the *so-ko* counterpart of (35b), given in (45).²⁸ I repeat (35) for convenience.

- (45) *so-ko-no* kantoku-o *do-no kyuudan-mo* uttaeta (koto)
 that-place-GEN manager-ACC which-GEN ball:club-also sued
 'its manager, every (baseball) team sued'

²⁸ Suppose, following Ueyama 1998: chap. 3, 2002: section 2.2.2, that the QPs, on a descriptive level, can be divided into two types, e.g., the *even NP* type and the *which NP* type, and that the 'dependent terms' can also be divided into two types, e.g., the *so-ko* type and the *so-no NP* type. In regard to the possible 'binder' and 'bindee' combinations, we have then yet to discuss the fourth combination, i.e., a pair of the *NP-sae* type (as the 'binder') and the *so-no NP* type (as the 'bindee'), and that will be addressed in section 4; see (87) and the discussion thereabout.

- (35) a. *so-ko-no kantoku-o Mettu-sae-ga uttaeta (koto)*
 that-place-GEN manager-ACC Mets even-NOM sued (fact)
 'its manager, even the Mets sued'
- b. **so-no kyūudan-no kantoku-o do-no kyūudan-mo uttaeta (koto)*
 that-GEN baseball:club-GEN manager-ACC which-GEN baseball:club-also sued (fact)
 'that (baseball) team's manager, every (baseball) team sued'

In (45), we observe the reconstruction effects, i.e., BVA(*do-no kaisya-mo, so-ko*) is available. This indicates that the BVA in (45) must be based on LF c-command, which in turn suggests that the BVA in (46) below, which also involves the same QP and the same 'dependent term' as (45), can be based on LF c-command.²⁹

- (46) *do-no kyūudan-mo so-ko-no kantoku-o uttaeta (koto)*
 which-GEN ball:club-also that-place-GEN manager-ACC sued
 'every (baseball) team sued its manager'

One might suggest that the BVA(QP, *so-ko*) is always based on LF c-command, apart from the cases of BVA that are not contingent upon the structural relation between the 'binder' and the 'bindee', and that the contrast in (35) is solely due to the choice of the 'dependent term'—irrespective of what the 'binder' may be. If such were the case, we could use examples like (46) and consider the (un)availability of BVA(QP, *so-ko*) in our experiments designed to reveal the properties of Japanese that are sensitive to LF c-command.

There are, however, reasons to believe that BVA(QP, *so-ko*) need not be based on LF c-command. For example, the BVA in (43) continues to be available even if we replace *so-no kaisya* 'that company' with *so-ko* 'that place', as in (47).

- (47) [ko-no mura-kara do-no kaisya-ni haitta hito]-ga so-ko-no syatyoo-o
 this-GEN village-from which-GEN company-DAT entered person-NOM that-place-GEN president-ACC
 hihansi-temo mondai-ni naru daroo.
 criticize-even:if trouble-DAT become will
 (Roughly) 'No matter which *x*, *x* = a company, if [someone from this village who has joined *x*] criticizes *x*'s president, a big problem will ensue.'

The BVA in (47) cannot be based on LF c-command since *do-no kaisya* fails to c-command *so-ko*, and so would its trace. Given that 'reconstruction effects of BVA' are possible only if the availability of the BVA is based on LF c-command, we thus predict that the *NP-o NP-ga* counterpart of the conditional clause in (47) would fail to exhibit reconstruction effects, just as in the case of (44). The clear unavailability of the BVA in (48) confirms this prediction.

²⁹ The BVA in (i) does not seem possible, although some judgmental fluctuation is observed, suggesting that the BVA in (45) cannot be of the type characterized in footnote 17.

(i) **so-ko-no kantoku-ga do-no kyūudan(-o)-mo uttaeta (koto)*
 that-place-GEN manager-NOM which-GEN ball:club(-ACC)-also sued
 'its manager sued every (baseball) team'

- (48) (Cf. (47).)
 **so-ko-no* syatyoo-o [ko-no mura-kara *do-no kaisya-ni* haitta hito]-ga hihansitemo
 that-place-GEN president-ACC this-GEN village-from which-GEN company-DAT entered person-NOM criticize-even:if
 mondai-ni naru daroo.
 trouble-DAT become will

Ueyama (1998, 2002) in fact argues extensively, in the context of advancing her theory of anaphoric relations, for the conclusion that BVA(QP, *so-ko*) can be based either on LF c-command or in effect on PF precedence.³⁰ I will not review the relevant discussion by Ueyama for reasons of space, and I would instead like to turn to evidence for the same conclusion on the basis of the contrasts in (49), discussed in Hoji 1995.³¹

- (49) a. *?*Kasima kensetu-sae-ga so-ko-o* suisensita (koto)
 Kashima building:company-even-NOM that-place-ACC recommended
 'even Kashima Building Corp. recommended it'
- b. *Do-no kensetugaisya-ga so-ko-o* suisensita no?
 which-GEN building:company-NOM that-place-ACC recommended
 'Which construction company recommended it?'
- c. *Do-no kensetugaisya-mo so-ko-o* suisensita.
 which-GEN building:company-also that-place-ACC recommended
 'Every construction company recommended it.'
- (50) a. *Kasima kensetu-sae-ga so-ko-no* sitauke-o {suisensita/uttaeta} (koto)
 Kashima building:company-even-NOM that-place-GEN subsidiary-ACC recommended/sued
 'even Kashima Building Corp. {recommended/sued} its subsidiaries'

³⁰ The argument for this conclusion minimally requires the demonstration of the following.

- (i) BVA(A, B) is not possible for a pair of NPs, A and B, if A does not precede B, even when (the trace of) A c-commands B at LF.
 (ii) BVA(A, B) is not possible for a pair of NPs, A and B, if (the trace of) A does not c-command B at LF, even when A precedes B at PF.

The unavailability of the BVA in examples like (35b)—for a speaker who finds the BVA available in (35a)—demonstrates (i). The demonstration of (ii) is less straightforward, due to the general clause-boundedness of scope-taking by NPs such as *NP-sae* and an NP with a floating numeral quantifier. The possibility of so-called spec-binding gives rise to further complications; see footnote 84. Ueyama's (1998: chap. 2, 2002) evidence for (ii) is crucially based on the demonstration of (iii) with regard to 'multiple scrambling' construction as schematized in (iv). Let *cm* stand for a case marker other than the nominative *-ga*.

- (iii) *B* (and its QR trace) does not c-command *C* at LF although *B* precedes *C* at PF.
 (iv) A-cm B-cm C-ga V

The readers are referred to Ueyama 1998: section 2.4.2, 2002: 4.2 for the relevant empirical paradigms and discussion.

³¹ The acceptability of examples like (i) is discussed in some depth in Hoji 1995.

- (i) *Do-no kensetugaisya-ga so-no kensetugaisya-o* suisensita no?
 'Which construction company recommended that construction company?'

Some complications in the local disjointness paradigm will be addressed briefly in section 4.

- b. *Do-no kensetugaisya-ga so-ko-no sitauke-o {suisensita/uttaeta} no?*
 which-GEN building:company-NOM that-place-GEN subsidiary-ACC recommended/sued
 'Which construction company {recommended/sued} its subsidiaries?'
- c. *Do-no kensetugaisya-mo so-ko-no sitauke-o suisensita.*
 which-GEN building:company-also that-place-GEN subsidiary-ACC recommended
 'Every construction company recommended it.'

The marginal to impossible status of the BVA in (49a), in contrast to (50a), is attributed in Hoji 1995 to the local disjointness condition, commonly known as Principle B of the binding theory. The availability of the BVA in (49b) and (49c) even in the 'local context' thus points to the possibility that we are observing two types of BVA in (49) and (50). More specifically, the contrast between (49a) on the one hand and (49b)/(49c) on the other can be accounted for if (i) the BVA in (50a) must be based on LF c-command, while that in (50b) and (50c) can be based either on LF c-command or in effect on PF precedence—as argued in Ueyama 1998—and if (ii) we assume that the relevant local disjointness effects show up only with BVA that is based on LF c-command, as is argued for independently in Hoji 1997, 1998, 2002. Given this account, the BVA in (49b) and (49c) must be based on PF precedence, in effect; for if it were based on LF c-command, it should be unavailable, just as in the case of (49a). This in turn suggests that the (un)availability of BVA(*do-no NP* 'which NP', *so-ko* 'that-place') does not necessarily constitute evidence in regard to the properties of the Japanese sentences that are sensitive to LF c-command and hence cannot provide us with evidence for ACH. By contrast, the (un)availability of BVA(*NP-sae, so-ko*) does, since it must be based on LF c-command BVA(*NP-sae, so-ko*), as we have just observed; see (31a) for the evidence that it cannot be an instance of BVA that is of the type characterized in footnote 17.

2.2.4. Summary

We have been led to the conclusion that some instances of BVA are subject to the LF c-command requirement in (37) and others in effect to the PF precedence requirement in (40).³² If we wish to determine the c-command relation between two NPs (e.g., between *NP-ga* and *NP-o* in *NP-ga NP-o V*), on the basis of the (un)availability of BVA, we must therefore restrict our attention to the (un)availability of the BVA that is regulated only by the LF c-command-based condition.

The use of *pro* in the argument for ACH in the mid-1980s results in judgmental fluctuation and instability, due to the possibility of a group reading, which makes it unclear whether the BVA in question is based on LF c-command. Although the use of *so-ko*—which is singular-denoting—improved the situation, some problem remained in regard to the repeatability so long as we used *subete-no NP* 'every NP' and other NPs for which BVA is not impossible without satisfying a condition on the structural relation between the 'binder' and the 'bindee'. It has turned out that there are two types of BVA that do not 'suffer' from the problems just noted, and only one of them, as exemplified in (33), repeated below, seems to be based on LF c-command. More examples of this type of BVA will be discussed in later sections.

- (33) a. *Metu-sae-ga so-ko-no kantoku-o uttaeta (koto)*
 Mets-EVEN-NOM that-place-GEN manager-ACC sued (fact)
 'even the Mets sued its manager'

³² I leave aside the exact formulations and the nature of the conditions alluded to in (37) and especially (40). The readers are referred to Ueyama 1998: chap. 3.

- b. **so-ko-no kantoku-ga Mettu-sae-o uttaeta* (koto)
 that-place-GEN manager-NOM Mets-even-ACC sued (fact)

'its manager sued even the Mets'

It has also been noted that the local disjointness effects are observed clearly only when we consider the BVA of the sort illustrated in (33), which can be accounted for if we assume, as in Hoji 1997, 1998, 2002, that the relevant local disjointness effects show up only with BVA that is based on LF c-command.

The main point of this subsection can be summarized as follows. BVA is available in three distinct ways. One type of BVA is based on a relation established in the grammar; call it *pure BVA*, for the purposes of exposition. *Pure BVA* is crucially based on the structural relation of c-command. The other two types of BVA, on the other hand, are not based on a relation established in the grammar, despite their superficial resemblance to *pure BVA*. Let us call these types of BVA *pseudo-BVA*, again for ease of exposition. One of the two *pseudo-BVAs* seems to be analogous to what is often characterized as the E-type link; see Evans 1980. Although the availability of this type of BVA gives the appearance that it is subject to the precedence relation between the 'dependent term' and 'its antecedent', it is, strictly speaking, not constrained by grammar, i.e., it is not based on a relation that is established or licensed in the grammar. The availability of the other *pseudo-BVA* is more transparently non-grammatical in nature, as it does not seem to be sensitive to c-command or precedence. The argument for ACH presented in the mid-1980s based on the (un)availability of BVA does not distinguish the three types of BVA, and for this reason it gives rise to a great deal of judgmental fluctuation and instability. Concentrating on *pure BVA* enables us to attain a significantly higher level of repeatability, thereby making it possible to proceed in a more effective and reliable way than before in discovering the properties of the grammar of Japanese and ultimately those of UG. The result reported in this section is significant not only because the relevant paradigm that we have arrived at constitutes a much stronger empirical basis for ACH than what has previously been put forth in the literature, but also because the BVA thus identified, or more precisely a pair of NPs that 'give rise to' BVA only on the basis of LF c-command, will provide us with a powerful tool in our investigation of the c-command relation among NPs in various other 'constructions'; see the discussions in sections 3 and 4.

2.3. The scope-based argument

The main goal of this subsection is to illustrate that the scope-based argument for ACH in the mid-1980s can be strengthened in essentially the same way as the BVA-based argument for ACH. As in the case of the BVA-based argument, the scope-based argument for ACH in the mid-1980s suffers from repeatability problems. In this section, I will argue that we can attain a significantly higher degree of repeatability if we concentrate on certain QPs, drawing from the recent works by J.-R. Hayashishita, who in turn builds his analysis based on Ueyama's work on BVA.

2.3.1. The argument in the mid-1980s

The scope-based argument for ACH in the mid-1980s simply assumes that "something like Huang's condition in [(51)] (or Reinhart's (1976) Scope Principle in [(52)]) also applies to Japanese."³³ (Hoji 1985: chap. 4, sec. 4.3)

- (51) Suppose A and B are both QP's or both Q-NP's or Q-expressions, then if A c-commands B at SS, A also c-commands B at LF. Huang (1982: 220, (70))

³³ Hoji 1985: chap. 4, footnote 23 states:

- (i) Huang (1982) and Reinhart (1976) have different views regarding the relevant level for quantifier scope representation. While Huang, along with May (1977), assumes the relevant level to be that of LF, Reinhart assumes it to be the level of S-structure, [which is] surface structure in the terms of her discussion. The difference, however, does not concern us here in the present discussion, as far as we consider data from Japanese.

(52) A logical structure in which a quantifier binding a variable x has wide scope over a quantifier binding a (distinct) variable y is a possible interpretation for a given structure S just in case in the surface structure of S the quantified expression corresponding to y is in the (c-command) domain of the quantified expression corresponding to x . Reinhart (1976: 191, (39))

(51) states that the S-structure c-command relation between two scope bearing elements is preserved at LF. With the concomitant assumption, adopted in Hoji 1985: 243 "without discussion that the scope of a quantifier is its c-command domain at LF, as in May 1977 and Huang 1982, with the first branching definition of 'c-command'," (51) ensures that the S-structure c-command relation between two NPs determines their relative scope order, yielding the same result as (52).³⁴

Once we adopt this assumption, an argument for ACH can be automatically constructed if it is empirically established that QP_1 -*ga* QP_2 -*o* V unambiguously gives rise to the $QP_1 > QP_2$ order. The argument for ACH in the mid-1980s builds on Kuroda's (1970) observation in this regard.³⁵ Consider the examples in (53) and (54).³⁶

(53) (Kuroda 1970/1992: chap. 2, (54), given in Hoji 1985: chap. 4, (47). The word-by-word translation has been added.)

(Kono ie-no) dareka-ga (kono heya-no) subete-no hon-o yonda
 this house-GEN someone-NOM this room-GEN all-GEN book-ACC read

'Someone (in this house) read all the books (in this room).'

(54) (Kuroda's 1970/1992: chap. 2, (57); see Hoji 1985: chap. 4, (48). The English translation has been added.)

(Kono heya-no) subete-no hon-o (kono ie-no) dareka-ga yonda
 this room-GEN all-GEN book-ACC this house-GEN someone-NOM read

'All the books (in this room), someone (in this house) read.'

Kuroda notes that (53) means that "there is someone (in this house) who read all the books (in this room)," although (54) "seems to allow two readings, one synonymous with that assigned to [(53)] and the other with the inverted semantic order of quantifiers, i.e., meaning that for each book (in this room) there is someone (in the house) who has read it." His generalizations are given in (55).

(55) If a predicate corresponds to a sentence frame with the "preferred" word order, the semantic order of quantifiers is given by their linear order; if a predicate corresponds to a sentence frame with "inverted" word order, the semantic order of quantifiers is ambiguous. (Kuroda 1970: 138, 1992: chap. 2, 97)

What we are concerned with now is the scope order in the 'preferred' word order. With the reasonable

³⁴ The reason for choosing this assumption over the alternative along the lines of Baker's (1970) Q-indexing, without Quantifier Raising, is said to be "largely expository." (Hoji 1985: chap. 4, footnote 21)

³⁵ Kuroda 1969 and 1970 are reproduced as Kuroda 1992: chap. 2, and I will refer to Kuroda 1970 as Kuroda 1970/1992: chap. 2. When making reference to an example or a note in Kuroda 1970, I will refer to it as in Kuroda 1970/1992: chap. 2, note 26, as in the text here. When I refer to remarks in the text in Kuroda 1970/1992: chap. 2, I will mention the page number in both Kuroda 1970 and Kuroda 1992: chap. 2.

³⁶ See (57) and the remarks thereabout as well as Kuroda 1970/1992: note 26.

assumption that *NP-ga NP-o V* is the 'preferred' word order alluded to in (55), we can understand (55) as stating that the subject QP takes wide scope with respect to the object QP in *QP-ga QP-o V*. Notice that (55) states that the linear order directly reflects the scope order, in the 'preferred' (i.e., the 'unmarked' and 'basic') word order. Recall that this is precisely what we needed as an empirical basis for ACH, given the assumption adopted above in regard to the relevance of c-command for the determination of the relative scope order.

Kuroda's (1970/1992: chap. 2) main concern is the 'semantic order' of words like *sae* 'even', *mo* 'also' and *dake* 'only', rather than scope orders among the 'quantifier' phrases in (53) and (54); see Kuroda 1970: 136-140, 1992: chap. 2, 95-99.³⁷ For this reason, the empirical evidence provided in Kuroda 1970, 1992: chap. 2 for the generalization in (55) is rather limited; see Kuroda's (1970/1992: chap. 2) remarks right before his (54). A substantially wider range of empirical materials is presented in Hoji 1985. The descriptive generalization in (55) has since been widely accepted in the field and it seems to have been considered as an empirical basis for ACH.³⁸

We can raise two questions: one on the precedence vs. c-command issue, i.e., whether it is possible to argue for, instead of simply assume, the c-command-based account of quantifier scope, and the other on the repeatability of speakers' judgments as predicted in accordance with the proposed generalization. As in the case of our discussion of BVA, let us address the repeatability issue first.

2.3.2. The low repeatability

We first note that it is not difficult to construct sentences of the form *QP-ga QP-o V* in which the object QP can be understood as taking scope over the subject QP. The sentences in (56), for example, seem to allow such an interpretation fairly easily; cf. (53).

(56) a. (Ueyama 1998: 41, (47))

[Dareka-ga [uti-no subete-no sensyu-o] bikoositeiru] (toyuu
 someone-NOM OUR-GEN all-GEN athlete-ACC shadow COMP

koto-wa, zen'in-ga kiken-ni sarasareteiru toyuu koto da.)
 fact-TOP everyone-NOM danger-DAT exposed COMP fact COPULA

'(The fact that) someone is shadowing every athlete of ours (means that everyone's life is in danger.)'

$\exists x[\forall y(y = \text{athlete})[x \text{ is shadowing } y]]$

$\forall y(y = \text{athlete})[\exists x[x \text{ is shadowing } y]]$

b. (Hayashishita 2000: (12a), slightly adapted)

2-tu izyoo-no ginkoo-ga 5-tu-no kouriten-o siensita-ra ...

³⁷ In Kuroda 1970/1992: chap. 2, the generalization for the former is in fact distinct from that for the latter. Hoji 1985: chap. 5, 5.1 argues, in part drawing from Kuno 1973: 378-379, that the descriptive generalization in (55) can be extended to cover the cases involving particles such as *sae* 'even', *mo* 'also' and *dake* 'only'. It seems that the judgmental fluctuation observed in regard to the possible interpretations of examples like (i), which are said in Kuroda 1970, 140, 1992: chap. 2, 99 to be "devoid of meaning," can be accounted for along the lines of the analysis of judgmental fluctuation to be discussed in section 4.1.2.

(i) a. (=Kuroda 1970/1992: chap. 2, (63))

S.S. dake-o John-sae-ga yonda

b. (=Kuroda 1970/1992: chap. 2, (67))

S.S.-o sae John dake-ga yonda

The discussion, however, cannot be pursued here for reasons of space.

³⁸ (55) makes reference to the 'marked' order, such as *NP-o NP-ga V*, as well as the 'unmarked' order. I will return to the 'marked' order shortly.

2-CL OVER-GEN bank-NOM 5-CL-GEN retail:store-ACC support-if

'If two or more banks support five retail shops, ...'

Judgments contrary to the standard generalizations have been presented by more than a few researchers, e.g., Kitagawa 1990 and Kuno et al. 1999. In fact, many of the examples that are claimed in Hoji 1985 to be scopally unambiguous are judged to be ambiguous by many speakers. The level of repeatability in regard to the predicted judgments thus turns out to be not particularly high.

Before we proceed, it is perhaps important to note that we are not concerned with the 'scope order' of the sort indicated in (57).

- (57) a. dareka-ga subete-no gakusei-o suisensita
 someone-NOM all-GEN student-ACC recommended
 'someone recommended every student' (some>all)
- b. subete-no gakusei-ga dareka-o suisensita
 all-GEN student-NOM someone-ACC recommended
 'every student recommended someone' (some>all)

(57) does not involve a distributive reading and the (un)availability of the scope order in (57) does not seem to reveal the properties of the grammar, at least in any direct way. In other words, we are concerned strictly with what Hayashishita (2000, forthcoming) calls *wide scope distributive readings*.

2.3.3. Two types of wide scope distributive readings

Recall that BVA is found to be available in some cases without the relevant c-command or precedence relation between the two NPs in question. Recall further that, as observed in Ueyama 1998, we can eliminate the possibility of such BVA by controlling certain factors; see section 2.2.2.2 and especially footnote 17. It is interesting to note that the scope order that is possible without the c-command or precedence relation (henceforth *inverse scope*) can also be made unavailable by controlling essentially the same factors, as pointed out in Hayashishita 2000. Let us concentrate, as in section 2.2.2.2, on the factor that has to do with whether an NP can be used to refer to a specific group of entities.

Hayashishita (2000, forthcoming) observes that (58) does not yield the inverse scope—the *NP-o>NP-ga* scope order—as readily as (56b) does.³⁹

- (58) (= (12b) of Hayashishita 2000, slightly adapted)
 sukunakutomo 2-tu izyoo-no ginkoo-ga 20.5% izyoo-no kouriten-o siensita-ra ...
 at:least 2-CL MORE-GEN bank-NOM 20.5% OVER-GEN retail:shop-ACC support-if
 'if at least two or more banks supported 20.5% or more of the retail shops, ...'

Hayashishita argues that the contrast between (56b) and (58) is analogous to the contrast observed in Ueyama 1998 in regard to BVA, as illustrated in (59).

- (59) a. *so-ko-no zyooren-ga 20.5% izyoo-no kissaten-o suisensita node ...
 that:place-GEN regular-NOM 20.5% more-GEN coffee:shop-ACC recommended because
 'because *its* regulars recommended 20.5% or more of the coffee shops, ...'

³⁹ While Hayashishita 2000 deals with empirical materials in Japanese, Hayashishita forthcoming also presents the empirical materials in English that illustrate the same generalization.

- b. *?so-ko-no zyooren-ga (rei-no) 5-tu-no kissaten-o suisensita node ...*
 that:place-GEN regular-NOM (under:discussion-GEN) 5-CL coffee:shop-ACC recommended because
 'because *its* regulars recommended (those) 5 coffee shops (under discussion), ...'

As noted in Hayashishita forthcoming: chap. 2, the inverse scope in (56b) indeed seems to become easier to obtain if we add *rei-no* 'those ... under discussion' to *5-tu-no kouriten* 'five retail shops' in (56b), as in *rei-no itutu-no kouriten* 'those five retail shops under discussion', making it more transparent that the NP in question is intended to refer to a specific group.

Let us follow Hayashishita forthcoming: chap. 2 and attribute the contrast between (56b) and (58) to the same factor as that between (59a) and (59b), i.e., an NP of the form in (60a) can be used to refer to a specific group more easily than an NP of the form in (60b).⁴⁰

- (60) a. [_{NP} *rei-no* NP] 'NP under discussion'
 b. [_{NP} 20.5 % *izyoo-no* NP] '20.5% or more of the NPs'

Recall from the discussion of BVA in section 2.2.2.2 that it seems impossible to refer to a specific group of entities if we use certain NPs such as *NP-sae* 'even NP' or an NP with a floating quantifier; cf. (27). Precisely with such NPs, inverse scope seems impossible, as illustrated in (61).⁴¹

- (61) a. *3-tu-no ginkoo-ga Toyota-dake-ni monku-o itta*
 3-CL-GEN bank-NOM Toyota-only-DAT complaint-ACC said
 'three banks complained to only Toyota'
 b. *2-tu izyoo-no ginkoo-ga hudoosanya-o 5-tu suisensita-ra ...*
 2-CL OVER-GEN bank-NOM real:estate:company-ACC 5-CL recommend-if
 'if two or more banks recommend 5 real estate companies, ...'

(61a), for example, is true under (62) but not under (63). Let $A \implies B$ indicate that A complained to B.

- (62) Situation 1:
 There are six banks (1-6) and three companies (T(oyota), N, M).
 1 \implies T
 2 \implies T
 3 \implies T

⁴⁰ Liu (1990) makes an observation similar to Hayashishita's. What distinguishes Liu's (1990) generalization from Hayashishita's is as follows. As noted just above, Hayashishita (2000, forthcoming) maintains that the availability of inverse scope in examples like (56) and (58) is not based on a syntactic condition and is affected a great deal by pragmatic considerations. For Liu (1990), on the other hand, the availability of inverse scope is due to an inherent feature of a given QP, and hence pragmatic considerations are not expected to affect the availability of the inverse scope, contrary to what is pointed out in Hayashishita 2000, forthcoming. Beghelli & Stowell 1997, which makes crucial use of Liu's (1990) observations, also attributes the availability of inverse scope to syntactic properties of different types of QPs and the different Spec positions associated with them, and hence their proposal differs from Hayashishita's in the same way as Liu's does in the relevant respect. The readers are referred to Hayashishita forthcoming: chap. 2 for further discussion.

⁴¹ *NP-dake* 'only NP' is used instead of *NP-sae* 'even NP' in (61a) so that the different readings in question can be illustrated more easily. Hayashishita forthcoming contains an extensive discussion of the relevant empirical materials, including the impossibility of inverse scope in examples such as (61b), in contrast to those such as (56).

- 4 \implies T, N, M
- 5 \implies N, M
- 6 \implies M

(63) Situation 2:

- There are three banks (1-3) and three companies (T(oyota), N, M)
- 1 \implies T
- 2 \implies T, N
- 3 \implies T, N, M

Once we eliminate the possibility of inverse scope by using a certain type of QP, we thus obtain the generalization in (64).

(64) In QP_1 -*ga* QP_2 -*o* V , the $QP_1 > QP_2$ scope order is clearly available and the $QP_2 > QP_1$ scope order is clearly unavailable.

Since (64) is part of the generalization put forth in Kuroda 1970, which has been widely accepted since the mid-1980s, one may wonder what significance the preceding discussion might possibly have. I maintain that the significance does not have so much to do with the correctness of (64) as it does with its implications concerning repeatability.

Recall that if we simply consider the (un)availability of DR (=a wide scope distributive reading), (64) cannot be maintained; (64) sometimes holds, but sometimes it does not. But we can maintain a modified version of (64) if we confine our discussion to the DR that involves the type of QP such as those in (61). We have thus attained a substantially higher degree of repeatability than before by narrowing down the possible empirical materials that we use in our syntactic experiments. But the identification of the DR whose distribution conforms to (64) is not merely to make the generalization in (64) hold. Its significance has more to do with the following. Once we identify such DR, we can examine its interactions with various aspects of the grammar that also make crucial reference to c-command and other structural properties, and hope to be able to obtain a better understanding of the workings of the grammar under investigation and ultimately those of UG.

2.3.4. Scope reconstruction

If we adopt ACH, we can take the relevant structural relation to be c-command and restate (64) as in (65).

(65) If QP_1 c-commands QP_2 , the $QP_1 > QP_2$ scope order is clearly available but the $QP_2 > QP_1$ scope order is clearly unavailable.

Once we confine our discussion to the DR of the sort identified in the preceding subsection, we can derive the second half of (65) by (66), as in Hayashishita 2000, forthcoming; cf. also Ueyama 1998: section 2.3. $DR(A, B)$ stands for a wide scope distributive 'reading' of A over B .⁴²

(66) $DR(A, B)$ is available only if the A -position trace of A c-commands that of B at LF.

Given that NP -*o* NP -*ga* V can be derived from NP -*ga* NP -*o* V by PF movement (see section 2.2.3), we also predict (67).

⁴² As in the case of $BVA(A, B)$, $DR(A, B)$ is a descriptive term (representing the speaker's intuition of a particular kind) and is not part of the theory.

(67) If DR(QP₁, QP₂) is available in (68a) it is also available in (68b).

- (68) a. QP₁-ga QP₂-o V
b. QP₂-o QP₁-ga V

'Scope reconstruction' is indeed observed. The DR(NP-ga, NP-o) is available in (69) very much in the way it is in (70).⁴³

- (69) a. 3-tu izyoo-no ginkoo-o Toyota-dake-ga suisensita-ra ...
3-CL OVER-GEN bank-ACC Toyota-only-NOM recommend-if
'if three or more banks recommend only Toyota, ...'
b. 2-tu izyoo-no ginkoo-o hudoosanya-ga 5-tu suisensitara ...
2-CL OVER-GEN bank-ACC real:estate:company-NOM 5-CL recommend-if
'if two or more banks, five real estate companies recommend, ...'

- (70) a. Toyota-dake-ga 3-tu izyoo-no ginkoo-o suisensita-ra ...
Toyota-only-NOM 3-CL OVER-GEN bank-ACC recommend-if
'if only Toyota recommends three or more banks, ...'
b. hudoosanya-ga 5-tu 2-tu izyoo-no ginkoo-o suisensita-ra ...
real:estate:company-NOM 5-CL 2-CL OVER-GEN bank-ACC recommend-if
'if 5 real estate companies recommend two or more banks, ...'

The example in (71), which is the *NP-o/ni NP-ga V* counterpart of (61a), continues to be true under (62).⁴⁴

- (71) (Cf. (61a).)
Toyota-dake-ni 3-tu-no ginkoo-ga monku-o itta
Toyota-only-DAT 3-CL-GEN bank-NOM complaint-ACC said
'to only Toyota, three banks complained'

The 'scope reconstruction' provides support for the thesis that *NP-o NP-ga V* can be represented identically to *NP-ga NP-o V* at LF in the relevant respects. The particular analysis I have adopted in section 2.2.3 is the PF movement analysis; see footnote 24. Notice that the availability of DR(QP₁, QP₂) in (68b) constitutes evidence for the relevant movement in question *only if* (72) holds.

(72) DR(QP₂, QP₁) is not available in *QP₁-ga QP₂-o V*.

If DR(QP₂, QP₁) is available in (68a), there is no strong reason to believe that DR(QP₁, QP₂) in (68b) is due to 'reconstruction effects', since the DR in question is possible without satisfying the *ecommand* condition in (66). It is for this reason that we have used a certain type of QP as A of DR(A, B) in the

⁴³ As noted in (55), the generalization under discussion is made initially in Kuroda 1970/1992: chap. 2 and further discussed in Hoji 1985: chap. 4; but see the first sentence in footnote 37.

⁴⁴ (71) also seems true under (63) as well, unlike (61a); we will return to it in section 3.5.

preceding discussion, ensuring that (72) holds.⁴⁵

2.3.5. The so-called scrambling construction in Japanese

It is observed in Kuroda 1970: 138 (see the second half of (55)), and commonly accepted since the mid-1980s, that DR(QP₂, QP₁) is available in *QP₂-o QP₁-ga V*; but see footnote 37. This is illustrated in (71), repeated here, which contrasts with (61a), also repeated here.⁴⁶

(71) Toyota-dake-ni 3-tu-no ginkoo-ga monku-o itta ...
Toyota-only-DAT 3-CL-GEN bank-NOM complaint-ACC said
'to only Toyota, three banks complained, ...'
DR(only Toyota, three banks)

(61a) 3-tu-no ginkoo-ga Toyota-dake-ni monku-o itta
3-CL-GEN bank-NOM Toyota-only-DAT complaint-ACC said
'three banks complained to only Toyota'

Under the situation in (63), (71) seems true although (61a) is false, as mentioned in footnote 44; i.e., DR(only Toyota, three banks) seems available in (71) while it is not in (61a). Combined with the generalization noted earlier (see (67)), we obtain (73), which in fact is the generalization put forth in Kuroda 1970: 138. (68) is repeated here for convenience.

(73) a. DR(QP₁, QP₂) is available not only in (68a) but also in (68b).
b. DR(QP₂, QP₁) is available in (68b) but not in (68a).

(68) a. QP₁-ga QP₂-ni/o V
b. QP₂-ni/o QP₁-ga V

The generalizations in (73) and those in (74) below are widely accepted, and it seems fair to say that they constitute the 'core empirical paradigms' to account for concerning the so-called scrambling construction in Japanese.

⁴⁵ With other QPs, we can also attain repeatability with respect to the predicted judgments, but only to a limited extent; with such QPs, DR(QP₁, QP₂) is available in *QP₂-ga QP₁-o V* if various grammatical as well as non-grammatical conditions are met, as discussed in some depth in Hayashishita 2000 and forthcoming.

Hayashishita 2000 examines ditransitive constructions in light of the results reported above, and concludes (i) that the conflicting judgments reported in the literature, e.g., Hoji 1985, Kitagawa 1990 and Miyagawa 1997, in regard to the scope orders between the 'direct object' and the 'indirect object', are due to the failure to recognize and differentiate between two types of DRs, just as in the case of the conflicting judgments in regard to the scope orders between the subject and the object, and (ii) that once we restrict our attention to LF c-command-based DRs, the generalizations turn out to be in agreement with what is presented in Hoji 1985.

⁴⁶ It is pointed out in Hasegawa 1993: section 3.2, (26) that examples of the form *QP₂-{o/ni} QP₁-ga V* cannot yield the QP₂>QP₁ scope order if QP₂ is an NP with a floating quantifier. Examples like (i), which we obtain by placing the *NP-o* in (61b) at the sentence-initial position, in fact does not seem to allow the wide scope for the object QP.

(i) hudoosanya-o 5-tu 2-tu izyoo-no ginkoo-ga suisensi-tara ...
real:estate:company-ACC 5-CL 2-CL more-GEN bank-NOM recommend-if
'(if) five real estate companies, two or more banks recommend, ...'

It would be interesting to study how this observation can be characterized and accounted for under Ueyama's analysis of the so-called scrambling construction in Japanese, but I cannot pursue the question further in this paper for reasons of space.

- (74) a. BVA(QP, NP) is available not only in (75a) but also in (75b).
 b. BVA(QP, NP) is available in (75d) although it is not in (75c).

- (75) a. QP-ga [... NP ...]-ni/o V
 b. [... NP ...]-ni/o QP-ga V
 c. [... NP ...]-ga QP-ni/o V
 d. QP-ni/o [... NP ...]-ga V

The relevant 'puzzle' has been often stated as (76), and several analyses have been proposed in the literature that are meant to account for (76); cf. Saito 1985, Saito 1992, and Ueyama 1998: chap. 2, 2002, among others.

- (76) The 'landing site' of scrambling in Japanese exhibits the properties of an A-position as well as those of an A'-position.

Ueyama 1998: chap. 2 and Ueyama 2002 propose an analysis of the so-called scrambling construction in Japanese that is based on the empirical considerations of the sort discussed in this paper. Hayashishita forthcoming examines the 'interaction' between BVA and DR in some depth, makes a number of predictions, and illustrates how they are borne out; he addresses not only the scope orders among quantifiers of the sort considered in this section but also the scope orders and interpretive possibilities involving *wh*-words and negation, including 'pair-list' readings. The experiments in Ueyama 1998: chap. 2, 2002 and those in Hayashishita 2000 seem to attain a significantly higher level of repeatability than in the previous works in regard to the generalizations about BVA and DR precisely because they identify and concentrate on the BVA and the DR that *must be* based on LF c-command.⁴⁷

2.3.6. Summary

The argument for ACH that was put forth in the mid-1980s on the basis of quantifier scope interpretations is based on the empirical claim in (77).

- (77) $QP_1 > QP_2$ is the only scope order available in QP_1 -ga QP_2 -o V.

In this section, we first observed that the speakers' judgments often do not conform to (77). Certain instances of wide scope distributive readings (DR) were shown not to be based on a structural condition. Clear parallelism was then observed between such DRs and the BVA that is not based on a structural condition (see section 2.2), as extensively discussed in Hayashishita forthcoming. Once we exclude the non-structurally-based DRs and concentrate on the DRs that are structurally-based, significantly clearer judgments emerge, more in harmony with (77).

The recognition of the DR that is not structurally-based and our understanding of under what conditions it may arise—though the latter is far from complete—have played a crucial role in sharpening the empirical paradigms in regard to DR, as in the case of BVA. In the context of constructing a falsifiable proposal with respect to properties of natural language that are solely based on LF c-command, it is important to understand the following. It is crucial that we can identify (i) BVA(A, B) that *must be* based on LF c-command and (ii) DR(A, B) that *must be* based on LF c-command. The absence of a

⁴⁷ The charts in Ueyama 1998: 287-289, which summarize the interactions of four factors—(i) LF c-command, (ii) PF precedence, (iii) the type of the 'binder' and (iv) the type of 'dependent term'—illustrate how her theory's predictions are borne out in regard to the availability of the BVA in all of the 16 combinations of these factors. Cases involving more than one instance of BVA are discussed in Ueyama 1998: chap. 2 and Ueyama 2002. Hayashishita 2000, forthcoming examines cases involving more than one instance of DR and BVA.

satisfactory account of (i) BVA(A, B) that *need not* be based on LF c-command or (ii) DR(A, B) that *need not* be based on LF c-command, however, does not necessarily mean a (fatal) shortcoming of the proposal in question. Given that some of the factors that contribute to the availability of such BVAs and DRs are not grammatical, as discussed in the preceding discussion, and given that we do not (yet) understand the nature of those factors well enough, we cannot make definite predictions in regard to the (un)availability of such BVAs and DRs, at least for now; cf. the remarks in section 1. What we can do instead is to control as much as we can the relevant factors that contribute to their availability so as to be able to isolate and focus on the BVA and the DR that are crucially based on LF c-command. As noted earlier, by making our syntactic experiments as controlled as possible, we can be in a better position than before to investigate the interaction between what underlies the BVA and DR in question and other formal properties of language, and hope to be able to obtain a better understanding of the grammar under investigation and ultimately of UG.

3. A Proposal and Predictions

In this section, I will provide a theoretical characterization of the LF c-command-based BVA, and state how the proposal advanced here can in principle be falsified, by spelling out some of the predictions it makes.⁴⁸

3.1. A theoretical characterization of LF c-command-based BVA

In section 2, I have discussed three properties of LF c-command-based BVA, which can be characterized roughly as in (78).

- (78) a. It is subject to the LF c-command requirement.
 b. It exhibits reconstruction effects.
 c. It exhibits the local disjointness effects.

The paradigms in (79), (80), and (81) illustrate the properties in (78a), (78b), and (78c), respectively.

- (79) a. (=33a)
Mettu-sae-ga so-ko-no kantoku-o uttaeta (koto)
 'even the Mets sued its manager'
 b. (=34a)
 **so-ko-no kantoku-ga Mettu-sae-o uttaeta (koto)*
 'its manager sued even the Mets'
- (80) (=35a)
so-ko-no kantoku-o Mettu-sae-ga uttaeta (koto)
 'its manager, even the Mets sued'
- (81) a. (Cf. (50a).)
Toyota-sae-ga so-ko-no sitauke-o {suisensita/uttaeta} (koto)
 'even Toyota {recommended/sued} its subsidiaries'
 b. (Cf. (49a).)
 *?*Toyota-sae-ga so-ko-o suisensita (koto)*
 'even Toyota recommended it'

Recall that what is meant by BVA(A,B) is the speaker's intuition that the value of B, which does not

⁴⁸ Mainly for reasons of space, a theoretical characterization of the LF-based DR will not be provided in what follows.

have a value of its own, 'co-varies' with that of A, roughly speaking. Of the three types of BVA discussed above, we are concerned with the one whose availability is based on LF c-command. We can understand, following the essentials of Chomsky 1976: 199-204 and Reinhart 1983: chap. 7, that what underlies this type of BVA, which I have called *pure BVA*, is an LF and an SR representation as schematized in (82a) and (82b), respectively.⁴⁹

- (82) a. LF: [A₁ [... t₁ ... B ...]]
 b. SR: A (λx (... x ... x ...))

We have seen in section 2 that we can observe BVA(A, B) most clearly when B is a singular-denoting NP and A is not. Let us therefore restrict our attention to such cases. Given that B is singular-denoting, and given that the value of B is identical to that of the trace of A, it follows that the value of the trace must also be singular. Since A itself is not singular-denoting, however, a mismatch of some sort arises. I assume that the relevant mismatch is dissolved by the operator-variable structure as indicated in (82b), and further assume that the LF object that gets mapped to the variable bound by the operator in SR is the trace left by the movement of A at LF, often referred to in the literature as Quantifier Raising (QR).⁵⁰

The LF c-command requirement on the availability of BVA thus states, in the terms just given, that an NP B can be mapped to a variable that is bound by the same operator that binds the trace of an NP A only if the trace of A c-commands B at LF. Let us assume, following Hoji 1997, 1998a and Ueyama 1998, that (i) there is a formal relation at LF, which is called FD (Formal Dependency), (ii) this relation is subject to (83), and (iii) its interpretive consequence is as in (84).⁵¹

(83) *FD(α, β) if α does not c-command β.

(84) Given FD(α, β), the value of β must be identical to that of α.

⁴⁹ SR stands for Semantic Representation, which I assume is one of the two output representations of the generative procedure, following Ueyama 1998: section 5.1.1, for example, with the other being PF Representation. When the distinction between LF and SR is not crucial, as in the preceding discussion, I simply refer to LF as an output of the generative procedure instead of SR.

⁵⁰ Both assumptions are commonly adopted. While some version of the former seems unavoidable, the latter assumption does not seem to have the same status as the former, and its justification seems to depend in part on the organization of grammar one wants to adopt or pursue.

As to what in the grammar triggers the movement as indicated in (82a), I take the position that nothing triggers it and that the relevant movement at LF is optional, which I wish to assume is one of the two optional adjunction allowed in UG, with the other being PF adjunction. I assume that the mismatch of the sort just mentioned can be understood as a special manifestation of what is commonly referred to as the type mismatch, i.e., the mismatch between $\langle\langle e, t \rangle, t \rangle$ and e . I assume that the grammar does not disallow a linguistic object A whose semantic type is $\langle\langle e, t \rangle, t \rangle$ to (be generated and) remain in a so-called argument position at LF, without undergoing QR. In such cases, the mapping from LF to SR simply fails, and the relevant derivation does not yield a well-formed structural description. Cf. Heim & Kratzer 1998: 7.3.

⁵¹ FD(α, β) is a formal notion and is claimed to be part of the theory of grammar pursued here. Recall that BVA(A, B) and DR(A, B), by contrast, are descriptive terms, not part of the theory, and they are intended to express certain linguistic intuitions of the speaker. A point of contention here is that FD is a formal relation that underlies certain instances of BVA, and, to the extent that we are interested in discovering the properties of the language faculty by examining (i) the interaction between FD and other formal properties of language and (ii) what other linguistic intuitions of the speaker are crucially based on FD, we must concentrate on the BVA that is based on FD. Hoji in press addresses related issues with regard to sloppy identity readings.

The mapping of B in (82a) to a variable in (82b) is therefore a consequence of (84), together with an independently needed, and widely accepted, assumption that the trace of QR gets mapped to a bound variable. In other words, the LF c-command-based BVA requires an FD.

Now let us consider (78), repeated here, in light of the theoretical characterization of the BVA just given.

- (78) a. It is subject to the LF c-command requirement.
 b. It exhibits reconstruction effects.
 c. It exhibits the local disjointness effects.

(78a) follows immediately from (83). (78b) follows from the assumption that the 'marked' order, i.e., *NP-o/ni NP-ga V*, can be derived by the PF movement of *NP-o/ni* from its theta-position; see footnotes 24 and the first sentence of the second paragraph of footnote 50. It is not clear exactly how (78c) follows from the formal characterization of LF c-command-based BVA as sketched above. It is stipulated in Hoji 1997, 1998a that the establishment of FD itself is subject to the anti-locality condition; the proposal in Hoji 1997, 1998a is essentially a restatement of Reinhart's (1983) insight in terms of asymmetrical relation of FD, instead of co-indexation.⁵² Space limitation prevents me from providing further discussion and I simply assume here that (78c) is in part due to (84), without spelling out how.

We have earlier observed the contrast in (35), repeated here.⁵³

- (35) a. *so-ko-no kantoku-o Mettu-sae-ga uttaeta (koto)*
 that_{place}-GEN manager-ACC Mets even-NOM sued (fact)
 'its manager, even the Mets sued'
- b. **so-no kyuudan-no kantoku-o do-no kyuudan-mo uttaeta (koto)*
 that_{GEN} baseball:club-GEN manager-ACC which-GEN baseball:club-also sued (fact)
 'that (baseball) team's manager, every (baseball) team sued'

While (35a) exhibits reconstruction effects, (35b) does not. Recall that the BVA is available in the *NP-ga NP-o V* counterparts of both (35a) and (35b), as illustrated in (33), also repeated here.

- (33) a. *Mettu-sae-ga so-ko-no kantoku-o uttaeta (koto)*
 Mets even-NOM that_{place}-GEN manager-ACC sued (fact)
 'even the Mets sued its manager'
- b. *do-no kyuudan-mo so-no kyuudan-no kantoku-o uttaeta (koto)*
 which-GEN baseball:club-also that_{GEN} baseball:club-GEN manager-ACC sued (fact)
 'every (baseball) team sued that (baseball) team's manager'

Recall further that, once *so-no kyuudan* in (35b) is replaced by *so-ko*, as in (45), repeated here, we observe reconstruction effects.

⁵² As noted in Hoji 1998c, a reinterpretation of Reinhart's (1983) proposal in terms of the asymmetrical dependency relation is much more natural than one might think; see for example the last paragraph in Reinhart 1983: chap. 7.

⁵³ (35b) has been repeated above as (80). See Ueyama 1998: chap. 3 for a number of relevant examples that illustrate the contrast under discussion.

- (45) *so-ko-no kantoku-o do-no kyuudan-mo uttaeta (koto)*
 that.place-GEN manager-ACC which-GEN ball:club-also sued
 'its manager, every (baseball) team sued'

What emerges is the descriptive generalization in (85).

- (85) Reconstruction effects in regard to BVA are observed with *so-ko* but not with *so-no NP*.

One might ask why (85), rather than its opposite—such as (86)—should hold.

- (86) Reconstruction effects in regard to BVA are observed with *so-no NP* but not with *so-ko*.

The theoretical characterization of the LF c-command-based BVA given above seems to offer an answer to this question, as argued in Ueyama 1998: 5.3.2 and further discussed in Hoji et al. 1999. Notice first that (78a) and (78b) are both due to (83), repeated here.

- (83) *FD(α , β) if α does not c-command β at LF.

Now, consider (84), also repeated here for convenience.

- (84) Given FD(α , β), the value of β must be identical to that of α .

For the FD under discussion, α of FD(α , β) is always a trace of an NP that has undergone QR and the trace gets mapped to a bound variable at SR. Given (84), this means that β of FD(α , β) in such cases must also be mapped to a bound variable. This in turn means that whatever 'semantic content' β in FD(α , β) is understood to have, it must be suppressed, so to speak, when it has been mapped to a bound variable. If we assume, as it seems natural, that *so-ko* is generally understood to have less 'semantic content' than *so-no NP* 'that NP', such as *so-no kyuudan* 'that baseball club', it follows that there is less difficulty with the former than with the latter in regard to their mapping to a bound variable; see footnote 10 for the basic paradigm of the Japanese demonstratives.

Our account of the contrast in (35) is thus as follows. Both (35a) and (35b) can be represented at LF as *NP-ga NP-o V*; hence FD(*t*, *so-no kyuudan*) as well as FD(*t*, *so-ko*) are possible at LF, with the *t* being the trace of the QP. Crucially, the relevant LF representation can be mapped to the 'intended' SR only if the semantic content of {*so-ko/so-no kyuudan*} can be understood to be 'small enough', so to speak. The source of the contrast in (35) is thus the difference in the 'semantic content' between *so-ko* 'that place' and *so-no kyuudan* 'that baseball club'.⁵⁴

The LF c-command-based BVA has been characterized by (i) its sensitivity to c-command, (ii) the local disjointness effects that it gives rise to, and (iii) its sensitivity to the 'semantic content' of the 'dependent term'. Of these, (i) is clearly a formal property. Although the exact nature of the

⁵⁴ What is crucial is the difference between *-ko* in *so-ko* 'the place, it' and *kyuudan* in *so-no kyuudan* 'the ball club'. It is analogous to the difference between *the thing* and *the computer* in English, for example, and a similar contrast seems to be felt in (i), to the extent that the effects of Condition C can be suppressed; ; see Hoji et al. 1999: sec. 4, especially (31)-(34) for relevant discussion.

- (i) a. ??/?*Even a Power Mac* made the person who had designed *the thing* a millionaire.
 b. */*? *Even a Power Mac* made the person who had designed *the computer* a millionaire.
 (ii) a. ?Which one of the original designers of *the thing* did *every super computer* make a millionaire?
 b. *Which one of the original designers of *the computer* did *every super computer* make a millionaire?

condition/principle that is ultimately responsible for the local disjointness effects is not clear, (ii) has a formal aspect to it insofar as it makes reference to the local domain that is structurally defined so as to differentiate between (81a) and (81b), for example. We therefore should be able to design experiments that make crucial reference to (i) and (ii), and expect their results to be robust (if the other relevant factors are properly controlled).

The 'semantic content' in (iii), on the other hand, has a radically different status. The amount of 'semantic content' of an NP is not (solely) determined by its lexical property. Ueyama (1998: 127) points out that "[if] everyone has been talking about automobile companies to the effect that the NP 'automobile company' becomes not informative any more," the 'semantic content' of NPs such as *so-no zidoosyagaisya* 'that automobile company' can be understood to be 'small enough' in regard to its mapping to a bound variable.⁵⁵ It is, therefore, not possible to design experiments that make crucial reference to whether the 'semantic content' of a given 'dependent term' is 'small enough', and expect their results to be robust.

While the relevant indeterminacy of the 'semantic content' of a given 'dependent term' might make one feel uneasy as to its exact role in our attempt to discover the formal properties of the language faculty, there are other phenomena in Japanese that seem to be similarly sensitive to the 'semantic content' of an NP. Before we proceed, I would like to briefly discuss two such phenomena; they have to do with the availability of BVA with certain QPs and the possibility of 'resumption'.

First, there is a descriptive generalization, presented in Ueyama 1998: chap. 3, in press: section 2.2.2, that certain NPs, such as *NP-sae* 'even NP', can be A of BVA(A, B) only if the BVA is based on an LF containing FD (henceforth simply *based on FD* for convenience). Consider (33a) again.

- (33) a. *Metu-sae-ga so-ko-no kantoku-o uttaeta (koto)*
 Mets-EVEN-NOM that-place-GEN manager-ACC SUED
 'even the Mets sued its manager'

If we substitute *so-no kyuudan* 'that baseball club' for *so-ko* 'that place' in (33a), we obtain (87).⁵⁶

- (87) **Metu-sae-ga so-no kyuudan-no kantoku-o uttaeta (koto)*
 Mets-EVEN-NOM that-GEN ball:club-GEN manager-ACC sued
 'even the Mets sued that (baseball) team's manager'

As indicated, BVA does not seem available in (87), and it seems that the BVA with certain NPs, such as *NP-sae* 'even NP', is available only based on FD. If BVA(*Metu-sae*, B) must indeed be based on FD, it follows that the 'semantic content' of B in BVA(*Metu-sae*, B), hence β in FD(t , β), where the t is the trace of *Metu-sae* 'even the Mets', must be 'small enough'. The status of (87) is therefore just as expected, if the 'semantic content' of *so-no kyuudan* 'that baseball club' is understood not to be 'small enough', as it seems natural because of the semantic content that is inherent to *kyuudan* 'baseball club', in contrast to *-ko* in *so-ko*, which is a bound morpheme roughly corresponding to *-ere* in *here*, *there*, and *where* in English.

⁵⁵ We in fact observe that, upon being exposed to numerous examples with *kaisya*, speakers tend to 'allow' the FD-based BVA with *so-no kaisya* 'that company' more easily than they did prior to the relevant exposure. This observation is perhaps crucial in understanding what underlies the ensuing discussion concerning the 'semantic content' of an NP, and in particular what is meant by *how much semantic content an NP is understood to have*. It is worth noting here that exposure to the relevant examples does not seem to weaken the effects of the LF c-command restriction on the availability of the BVA in question. If anything, the effects are felt more clearly, and the relevant contrast seems to become sharper, as the exposure to the relevant paradigms increases.

⁵⁶ This is the "fourth combination," alluded to in footnote 28.

Turning to the second phenomenon, it is observed in Hoji & Ueyama 1998 that the cleft construction in Japanese allows 'resumption', as indicated in (88).

- (88) a. ?[John-ga saisyoni *so-ko-o* uttaeta no]-wa *Toyota-o* da.
 John-NOM first thatplace-ACC sued COMP-TOP Toyota-ACC be
 'It was *Toyota-ACC* that John sued *it-ACC* first.'
- b. ?[Mary-ga John-ni *so-ko-o* suisensita no]-wa *Toyota-o* da.
 Mary-NOM John-DAT thatplace-ACC recommended COMP-TOP Toyota-ACC be
 'It was *Toyota-ACC* that Mary introduced *it-ACC* to John.'

Without the 'resumptive' *so-ko-o*, we have (89) in place of (88).⁵⁷

- (89) a. [John-ga saisyoni *ec* uttaeta no]-wa *Toyota-o* da.
 John-NOM first sued COMP-TOP Toyota-ACC be
 'It was *Toyota-ACC* that John sued *ec* first.'
- b. [Mary-ga John-ni *ec* suisensita no]-wa *Toyota-o* da.
 Mary-NOM John-DAT recommended COMP-TOP Toyota-ACC be
 'It was *Toyota-ACC* that Mary introduced *ec* to John.'

It is argued in Hoji 1987, 1990: chap. 5 that the cleft construction as in (89) involves null operator movement, and it is proposed in Hoji & Ueyama 1998 that the relevant movement is the IP adjunction at LF of an empty NP, and the empty NP so adjoined gets mapped to a λ -operator at SR.⁵⁸

⁵⁷ It must be pointed out that examples like (89) are often felt to be marginal, in contrast to (i), in which the case-marker on the NP in the 'focus position' is absent.

- (i) a. [John-ga *ec* uttaeta no]-wa *Toyota* da.
 John-NOM sued COMP-TOP Toyota be
 'It was Toyota that John sued.'
- b. [Mary-ga John-ni *ec* suisensita no]-wa *Toyota* da.
 Mary-NOM John-DAT recommended COMP-TOP Toyota be
 'It was Toyota that Mary recommended to John.'

As first observed in Hoji 1987, and further discussed in Hoji 1990, Hoji & Ueyama 1998, the formal properties of the cleft examples can be seen clearly only if we examine examples in which the NP in the 'focus position' is case-marked. For this reason, the suppression of the marginality associated with (89), and for that matter with (88) as well, is an inevitable aspect of the experiments that are designed to investigate the formal properties of Japanese on the basis of the cleft sentences. As in Fukaya & Hoji 1999: footnote 1, I maintain that "the marginality that may be associated with the CM-examples [i.e., the cleft construction with a case-marker on the NP in the 'focus position', HH] is not due to grammatical factors, but rather due to factors related to registers [or speech style, HH], as pointed out in Hoji & Ueyama 1998: footnote 6, for example. Even those speakers who tend to dislike CM-examples find much improvement or accept them quite readily, once the relevant examples are altered so that they are of a more formal register [or speech style, HH]." In addition to the factor just mentioned, there seems to be another factor that reduces the acceptability of examples like (88), to varying degrees, namely, the existence of their counterparts with the 'zero pronoun' as in (89). This factor, which also clearly seems functional in nature, must also be suppressed when we examine the status of the relevant examples and, more crucially, the contrast that we are concerned with here.

⁵⁸ According to Hoji & Ueyama 1998, the relevant movement is an instance of the generalized version of QR, i.e.,

Furthermore, Hoji & Ueyama 1998 maintains the following. First, the mapping of the empty NP to a λ -operator has a character quite similar to the mapping of an NP as a bound variable, as in the case of the interpretation of β in $FD(t, \beta)$. The mapping is possible precisely because the empty NP does not, or at least, need not, have any 'semantic content'. Second, the 'resumptive' *so-ko* 'that place' in (88) undergoes exactly the same movement as the empty NP at LF and gets mapped to a λ -operator at SR. This provides, at least, a partial account of the fact that the status of (88) is not as good as that of (89), since it seems reasonable to assume that *so-ko* 'that place' has more 'semantic content' than the empty NP.⁵⁹

Given the account of the 'resumption' in Hoji & Ueyama 1998 just sketched, we thus predict that the use of *so-no NP* in place of *so-ko* 'that place' in (88) results in unacceptability insofar as the *so-no NP* 'that NP' is understood to have more 'semantic content' than can be easily suppressed in its mapping to a λ -operator, so to speak. The sharply degraded status of examples like (90), in contrast to (88), confirms the prediction.⁶⁰

- (90) a. **[John-ga saisyoni so-no kaisya-o uttaeta no]-wa Toyota-o da.*
 John-NOM first that-GEN company-ACC sued COMP-TOP Toyota-ACC be
 'It was *Toyota-ACC* that John sued *that company-ACC* first.'

Constituent Raising in Reinhart's work in the late 1980s (a draft of Reinhart 1991). Reinhart (1987: 139) calls it *NP Raising*, attributing the rule to Heim 1982.

⁵⁹ As noted just above (see also footnote 10), *ko* in *so-ko* has the meaning of 'place'.

⁶⁰ Examples such as (i) are provided in Hoji & Ueyama 1998, and the replacement of *so-ko* by *so-no kaisya* in (i) also seems to result in unacceptability, as indicated in (ii).

- (i) (Hoji & Ueyama 1998: (59))
- a. *[[Toyota-sae]₁-ga [so-ko-o]₂ uttaeta no]-wa [[so-ko]₁-o tekitaisiteiru*
Toyota-even-NOM that-place-ACC sued COMP-TOP that-place-ACC be:hostile
kaisya-o]₂ da.
company-ACC COPULA
 'It was [the company which is hostile to it₁]₂ that [even Toyota]₁ sued [*so-ko*]₂.'
- b. *[Nissan-ga [Toyota-ni-sae]₁ [so-ko-o]₂ suisensita no]-wa [[so-ko]₁-o*
Nissan-NOM Toyota-DAT-even that-place-ACC recommended COMP-TOP that-place-ACC
tekitaisiteiru kaisya]₂-o da.
be:hostile company-ACC COPULA
 'It was [the company which is hostile to it₁]₂ that Nissan recommended [to even Toyota]₁ [*so-ko*]₂.'
- (ii) a. **[[Toyota-sae]₁-ga [so-no kaisya-o]₂ uttaeta no]-wa [[so-ko]₁-o tekitaisiteiru*
Toyota-even-NOM that-GEN-company-ACC sued COMP-TOP that-place-ACC be:hostile
kaisya-o]₂ da.
company-ACC COPULA
 'It was [the company which is hostile to it₁]₂ that [even Toyota]₁ sued [*so-ko*]₂.'
- b. **[Nissan-ga [Toyota-ni-sae]₁ [so-no kaisya-o]₂ suisensita no]-wa [[so-ko]₁-o*
Nissan-NOM Toyota-DAT-even that-company-ACC recommended COMP-TOP that-place-ACC
tekitaisiteiru kaisya]₂-o da.
be:hostile company-ACC COPULA
 'It was [the company which is hostile to it₁]₂ that Nissan recommended [to even Toyota]₁ [*so-ko*]₂.'

For some speakers, the relevant contrast is clearer in the above examples than in (89) and (90), presumably because the BVA interpretation involved therein 'requires' the establishment of a certain syntactic relation. For other speakers, however, the relevant contrast seems easier to detect in examples in (89) and (90) than in (i) and (ii), which one might attribute to the structural complexity in the former, among other factors. Some speakers detect the contrast clearly both in (89) and (90), and in (i) and (ii). See also footnote 57.

- b. *[Mary-ga John-ni *so-no kaisyā-o* *suisensita* no]-wa *Toyota-o* da.
 Mary-NOM John-DAT that-GEN company-ACC recommended COMP-TOP Toyota-ACC be
 'It was *Toyota-ACC* that Mary introduced *that company-ACC* to John.'

We have observed two additional phenomena that seem sensitive to the amount of the 'semantic content' of an NP, and these observations further support the relevance of the 'semantic content' of an NP β to the mapping of β to a bound variable at SR.

3.2. Further predictions —some correlations of judgments

Ko in *so-ko* has the meaning of 'place', hence the bound variable use of *so-ko* always requires the suppression of its 'semantic content', so to speak. One might thus wonder whether such 'suppression' of the 'semantic content' of *so-ko* is always possible, as the preceding discussion seems to suggest; see the acceptability markings on examples such as (17), (19), (20), (28), and (29). It in fact seems that the reported judgments there obtain when the 'semantic content' of *so-ko* is understood to be 'small enough'. For many speakers who have spent some time considering the (un)availability of BVA, examples such as (17), (19), (20), (28), and (29) seem readily acceptable. Most speakers who do not have any prior exposure to such examples, however, do not accept the BVA immediately.⁶¹

We thus make the following predictions.

- (91) Predicted Correlations I
 The more 'semantic content' *so-ko* 'that place' is understood to have,
- the less available BVA(*NP-sae, so-ko*) becomes (even if the c-command requirement is satisfied and the trace of *NP-sae* 'even NP' is not in the local domain of *so-ko*),
 - the less available BVA 'due to reconstruction effects' becomes, and
 - the more difficult the speaker finds the 'resumption' option.

Notice that, because of the nature of the 'semantic content' of *so-ko*, the proposed theory does not make definite predictions as to exactly when (i) BVA(*NP-sae, so-ko*) is available, (ii) reconstruction effects obtain with *so-ko* or (iii) *so-ko* can be used as 'resumption'.

How much 'semantic content' *so-no NP* is understood to have also varies, just as in the case of *so-ko*; hence we also make the predictions in (92).

⁶¹ Some, or possibly many, speakers thus need to *learn* to accept the bound variable use of *so-ko*, so to speak. Among the other forms in the chart in footnote 10 is *so-itu* 'that guy', and this NP has a clearly derogatory connotation. The fact that many speakers find the *pure BVA* use of *so-itu* less acceptable (and often highly marginal) than that of *so-ko* 'that place', as pointed out in Hoji 1995: footnote 21, is therefore not unexpected either, under the account of the LF c-command-based BVA given here. By contrast, the BVA that appears to be sensitive to PF precedence is not affected by the choice among *so-ko, so-itu* and *so-no NP*; see Ueyama 1998: chap. 3 and Hoji et al. 1999.

The judgmental fluctuation just noted in regard to the availability of BVA in Japanese contrasts sharply with the stable judgment on the relevant English sentences. As noted in Hoji 1995: sec. 3, "[w]hile the bound variable use of *it*, as in [(i)], is accepted by speakers without any difficulty at all, the reactions to the Japanese counterpart of [(i)], with *so-ko* in the genitive position, vary a great deal among the native speakers [of Japanese]."

- (i) (Hoji 1995: (45))
every university closed *its* Linguistics Department

It must be noted that the relevant difference between Japanese and English cannot simply be reduced to the different degrees of markedness in regard to the use of quantifier expressions in the two languages. While it is indeed the case that many of the quantifier expressions in English in the form of an NP/DP do not have their direct Japanese analogues, the difference under discussion manifests itself even if we use perfectly acceptable NPs such as *NP to NP* 'NP and NP' and *kanari-no kazu no NP* 'a good number of NP'.

- (92) Predicted Correlations II
 The less 'semantic content' *so-no NP* 'that NP' is understood to have,
- a. the more available BVA(*NP-sae*, *so-no NP*) becomes, provided that the c-command requirement is satisfied and the trace of *NP-sae* 'even NP' is not in the local domain of *so-no NP*,
 - b. the more available BVA 'due to reconstruction effects' becomes, and
 - c. the easier the speaker finds the 'resumption' option.

The proposed theory can therefore be falsified, in principle, if the predicted correlations in (91) and (92) do not obtain. The predicted correlations in (91) and (92) in fact do seem to obtain, thereby providing strong confirmation for the proposed account of BVA, and in particular, of the BVA that is based on FD (henceforth *FD-based BVA*, for convenience). Due to the space limitation, however, I do not provide the relevant examples here; they are fairly easy to construct based on what is provided above.

(91) and (92) are direct consequences of the general correlations in (93) that are predicted by the theoretical characterization of FD-based BVA proposed above.

- (93) Predicted Correlations
 The less 'semantic content' an NP B is understood to have,
- a. the more available BVA(*NP-sae*, B) becomes, provided that the c-command requirement is satisfied and the trace of *NP-sae* 'even NP' is not in the local domain of B,
 - b. the more available BVA 'due to reconstruction effects' becomes, and
 - c. the easier the speaker finds the 'resumption' option.

Some remarks are in order on the correlation between (93a) and (93b). Consider (94) and (95), with B being a *so-NP*.

- (94) a. how available BVA(*NP-sae*, B) is in *NP-sae-ga* [... B ...]-*cm V*
 b. how available BVA(*NP-sae*, B) is in [... B ...]-*cm NP-sae-ga V*
- (95) a. how available BVA(*do-no NP*, B) is in *do-no NP-ga* [... B ...]-*cm V*
 b. how available BVA(*do-no NP*, B) is in [... B ...]-*cm do-no NP-ga V*

The availability of the BVA is affected by the 'semantic content of B' not only in (94b) but also in (94a); hence the correlation between (94a) and (94b) is of little interest. The BVA seems available in (95a) as long as the 'N-content' of the 'bindee' is 'compatible' with that of the 'binder'.⁶² The availability of the

⁶² 'Compatibility' here is meant to cover not only the obvious case of (Japanese examples corresponding to) (i) but also the contrast in (those corresponding to) (ii); see Hoji 1995: sec. 5 and Ueyama 1998: Appendix C.

- (i) **every company* discussed *that woman's* proposal
 (ii) a. every syntactician thinks that we should invite that syntactician
 b. every syntactician thinks that we should invite that linguist
 c. *every linguist thinks that we should invite that syntactician

The contrast in (the Japanese examples corresponding to) (ii) is argued to be sensitive to c-command in Hoji 1995. Takubo & Kinsui (1998), however, demonstrate that it is sensitive to PF precedence. The relevant condition is formulated in Hoji et al. to appear as in (iii).

- (iii) (Hoji et al. in press: (33))

Condition D':

Nominal expressions α and β must be disjoint in reference if $\alpha \supset \beta$ and α precedes β , unless α and β are co-D-indexed, where $\alpha \supset \beta =_{\text{def}} \{x : x \text{ is } N_\alpha\} \setminus \{x : x \text{ is } N_\beta\}$, with N_γ designating that part of γ that represents the 'descriptive content' of a nominal expression γ .

BVA in (95b), on the other hand, depends upon how much 'semantic content' *B* is understood to have. The correlation of interest is therefore between (94a) and (95b). That is to say, the predicted correlation between (93a) and (93b) can be tested meaningfully only if we check the 'reconstruction effects of BVA(*do-no NP*, *B*)' (i.e., the availability of the BVA in (95b)) along with the general availability of BVA(*NP-sae*, *B*) (i.e., either in (94a) or (94b)). For example, if *B* is *so-no NP*, the BVA in (95b) is generally unavailable while the BVA in (95a) is readily available. What is predicted to correlate is thus the availability of the BVA in (95b) and that of the BVA in (94).

Recall that the BVA is available in (96); see footnote 31 and (49b).

(96) *do-no NP-mo so-no NP-o V*
'every NP Verb that NP'

The availability of the BVA in (96), in the 'local context', has been attributed to the BVA in question not being based on FD. For if it were based on FD, we should expect to observe local disjointness effects. Now consider (97).

(97) *NP-sae-ga [so-no NP-no NP]-o V*
'even NP Verb [that NP's NP]'

It has been argued in the previous subsection that the BVA is not available in examples of the form (97) due to the 'semantic content' of *so-no NP*. Given the discussion in this subsection, however, we expect the BVA in (97) to be available insofar as the 'semantic content' of *so-no NP* is understood to be 'small enough'. The expectation is indeed confirmed by the fact that some speakers can marginally accept examples like (97).

We now make the predictions in (98).

(98) Predicted Correlations III
a. To the extent that the BVA is available in (97), reconstruction effects are observed in (99).
b. Even when the BVA is found to be available in (97), it will not be so found in (100), i.e., in the 'local context'.

(99) [*so-no NP-no NP*]-o *NP-sae-ga V*
'[that NP's NP], even NP Verb'

(100) *NP-sae-ga so-no NP-o V*
'even NP Verb that NP'

Both of these predictions are indeed borne out, providing us with yet further confirmation for the proposed account of the FD-based BVA. Again for the reasons of space, I do not provide the actual examples here. They can be easily constructed on the basis of what is given above, as in the case of the examples that would confirm the predictions in (91) and (92).

3.3. Summary

In this section, I presented a theoretical characterization of the formal basis of *pure BVA*, which I called *FD-based BVA*, and considered some of its predictions ((91), (92) and (98)). Crucially, the predictions have to do with the correlations of judgments in regard to (i) the availability of BVA(*NP sae*, *B*), (ii) reconstruction effects, (iii) the possibility of 'resumption', and (iv) local disjointness effects. It cannot be stressed more that the discovery of the correlations noted in this section was made possible by the theoretical characterization of the formal basis of *FD-based BVA* proposed here, without which the observed fluctuation and instability of judgments on many of the examples discussed above might well remain unaccounted for and we would most likely be still unaware of the correlations noted in this section.

It is the prediction of these correlations, more than anything else, that makes our proposal falsifiable.

4. Repeatability and Falsifiability

By hypothesis, the grammar is a formal system that generates an output on the basis of an input to the system. Given a set of items with certain formal properties associated with them, the grammar yields a particular structural description, e.g., a pair of PF and LF representations. Once the LF representation has been generated, the grammatically-determined aspects of its interpretation are completely fixed, leaving no room for indeterminacy in regard to the presence or absence of a formal relation that underlies a certain interpretation. This naturally makes one wonder what gives rise to the judgmental fluctuation and instability that we observe and how we are to deal with them in formulating a falsifiable hypothesis. In this section I will try to address these questions, on the basis of the preceding discussion.

In section 4.1, I will first review the relevant aspects of the theory being pursued here. I will then try to articulate what predictions we make under the proposed theory of BVA and how they can be tested. I will also provide a brief summary of how we have identified the BVA that must be based on LF c-command, which has been an integral part of our attempt to attain repeatability. In section 4.2, I will present a brief discussion of the widely accepted hypothesis that *otagai* is a local anaphor. We will observe serious repeatability problems under this hypothesis, and it will be pointed out that an attempt to save it is likely to make the hypothesis not falsifiable.

4.1. Theory, predictions and repeatability

4.1.1. Theory

The proposed account of FD-based BVA can be summarized as follows.⁶³

(101) What is claimed about UG:

- a. There is a relation of *Formal Dependency* (FD).
- b. FD is a grammatical basis of one type of BVA.
- c. $FD(\alpha, \beta)$ is possible only if α c-commands β at LF, where α and β are both in A-positions.⁶⁴

⁶³ While they are not directly related to the discussion in this paper, I make the following assumptions about the generative procedure. The input to the generative procedure is a set of items (possibly more than one token of the same item) taken from the Lexicon, with each item being specified in the Lexicon as to its inherent properties, phonological, syntactic and semantic—I leave open whether 'morphological properties' are to be understood distinct from syntactic properties. Among the relevant syntactic properties are syntactic categories and formal agreement features. The semantic properties include semantic types such as $\langle e, t \rangle$ and $\langle \langle e, t \rangle, t \rangle$. An item selected from the Lexicon gets combined with another, and the object thus created will be subject to further applications of grammatical operations. A necessary condition for the well-formedness of an output α of the generative procedure is that the elements in α must be combined with one another in accordance with the relevant lexical specifications. This much seems uncontroversial although its particular implementations may differ from one another.

I also assume that theta role-related considerations are solely responsible for the so-called basic word order among the (so-called) argument NPs in Japanese with respect to a given V; cf. Grimshaw 1990: 3-4, for example. The empirical materials discussed in sections 2.2.3 and 2.3.4 constitute evidence for the view that *NP-ga NP-cm V* is the basic order and *NP-cm NP-ga V* is the marked order—leaving aside the cases of the unaccusative and related constructions (including the *niyotte* passive)—for which Kuroda (1970/1992: chap. 2) presents an argument on the basis of scope (and 'semantic') order of certain NPs; see sections 2.3.3 and 2.3.4. Haig (1980) and Kuroda (1980) independently argue for this view based on so-called floating (numeral) quantifiers. Cf. also the second paragraph of footnote 45.

⁶⁴ For the cases discussed in this paper, the content of the *where* clause need not be stipulated since it is an immediate consequence of (101d); cf. the remarks immediately following (82). Notice that (101c) is essentially an LF c-command variant of (i) (see (7)), provided that we focus on the type of BVA under discussion.

(i) (Chomsky 1976: 201, (105))

A variable cannot be an antecedent of a pronoun to its left.

d. The value of β of $FD(\alpha, \beta)$ is to be determined as being identical to that of α of the FD.

(102) What is assumed about UG:

- a. There is an optional adjunction operation at PF as well as at LF.
- b. When an NP of type $\langle\langle e, t \rangle, t \rangle$ gets adjoined at LF, its trace is of type e and is to be mapped to a pure bound variable.

Furthermore, I have stipulated (103) and assumed (104).

(103) What is stipulated:

Local disjointness

$FD(\alpha, \beta)$ results in local disjointness if α and β are co-arguments.

(104) What is assumed about the grammar of Japanese:

- a. *NP-cm NP-ga V* can be derived by the PF adjunction of the *NP-cm*, as argued in Hayashishita 2000, forthcoming and Ueyama 1998: chap. 2, 2002.
- b. The derivation of a CM-cleft involves the LF adjunction of an empty N to an IP, and the empty N gets mapped to a λ -operator at SR. It is possible for an overt N to occupy the position of the empty N throughout the relevant derivation, giving the appearance of 'resumption', as argued in Hoji & Ueyama 1998.

Although it has not been crucial in the preceding discussion, I also adopt Ueyama's (1998: chap. 2, 2002) proposal that *NP-cm NP-ga V* can be derived with the sentence-initial *NP-cm* being base-generated in an A-position outside the theta-domain of the *V*. Following Ueyama 1998, 2002, I will refer to *NP-cm NP-ga V* as *Surface OS* when it is analyzed as in (104a), and as *Deep OS* when it is analyzed as in the way just mentioned.^{65, 66}

In Chomsky 1976: 201, (i) is considered as "the subsidiary principle of anaphora," presumably in contrast to (ii).

(ii) (Chomsky, 1976: 197)

The rules of anaphora do not permit a pronoun that is outside the scope of a quantifier to be assigned an anaphoric relation to a bound variable within this scope.

What underlies (101c) is the intuition that what is considered as "subsidiary" in Chomsky 1976 is, but a condition alluded to in (ii) may not be, among what defines the language faculty proper. Similar remarks would apply to the condition on LF c-command-based DR discussed in section 2.3.4.

⁶⁵ Both (104a) and (104b) are extensively argued for in the works cited above; it is observed (in an unpublished work by J.-R. Hayashishita) that 'resumption' is possible in Deep OS but not in Surface OS and, as expected, reconstruction effects are not observed with resumption; cf. Ueyama 1998: Appendix A.2, Appendix B.1.1.

⁶⁶ I also assume that the *a*-demonstrative is lexically distinguished from the *so*- demonstrative in such a way that *a*-NPs are inherently referential while *so*-NPs are not. As indicated in (i), both *so-ko* and *a-soko* can be used as being coreferential with *Toyota*; see footnote 10.

(i) *Toyota-ga* {*so-ko/a-soko*}-no Osaka *sisya-o* heisasita (ra)
Toyota-NOM that-place-GEN Osaka branch-ACC shut:down (if)

'(if) *Toyota* shuts down *its* Osaka branch'

There is however a clear contrast between *so-ko* and *a-soko* in regard to the possibility of BVA. While BVA(NP, *so-ko*) is possible, BVA(NP, *a-soko*) is not; see Hoji in press, Hoji et al. 1999, and Ueyama 1998: section 4.2 and the references there. The 'inherently referential' nature of *a*-NPs, such as *a-soko*, is expressed in Ueyama 1998 by hypothesizing that *a*-NPs must be *D-indexed* (while *so*-NPs cannot); see Ueyama 1998: sections 4.2 and 4.3 for further discussion and the earlier references cited there.

4.1.2. Predictions and repeatability

The most crucial feature of the proposed account of BVA is FD. It is the postulation and the explicit characterization of the properties of FD that have enabled us to make definite predictions. FD-based BVA is claimed to have the properties in (105).

- (105) a. It is sensitive to c-command.
b. Reconstruction effects are observed.
c. Local disjointness effects are observed.
d. The 'semantic content' of the 'bindee' makes a difference.

Consider the BVA paradigm schematized in (106).

- (106) a. *QP-ga* [... *B* ...]-ni/o *V*
b. *[... *B* ...]-ga *QP-ni/o V*
c. [... *B* ...]-ni/o *QP-ga V*

The proposed analysis of FD-based BVA receives support insofar as we have a clear BVA paradigm as indicated in (106). Furthermore, we predict the FD-based BVA to be unavailable in (107) as long as QP and B are 'co-arguments'.

- (107) *QP-ga B-ni/o V*

In assessing the proposal, we can consider questions such as (108) and (109).

- (108) a. Can we ensure that the BVA in question must be based on FD?
b. Suppose we have identified a QP for which BVA(QP, B) *must* be based on FD. Do we then predict BVA(QP, B) to be available in (106a)?
- (109) Suppose such BVA is available in (106a).
a. Do we predict that it is also available in the (106c) counterpart of (106a)?
b. Do we predict that it is unavailable in (107)?

The answer to (108a) would be in the affirmative if we could identify a QP for which BVA(QP, B) *must* be based on FD. The relevant identification, however, is not easy; see the discussion below. The answers to (108b) and (109a) are in the negative. Let us first consider (108b). The BVA(QP, B) *must* in principle be available in (106a) as long as B is not lexically marked as 'inherently referential'; see footnote 66. As we have observed, however, the availability of the BVA(QP, B) that is based on LF c-command is affected by how much 'semantic content' B is understood to have; and as long as that is influenced by pragmatic considerations, we cannot predict, with certainty, the availability of FD-based BVA in (106a). As to (109a), the BVA in (106c) is predicted to be available only if (106c) is 'an instance of' Surface OS, i.e., if (106c) is associated with the structural description whose LF representation is identical to (106a). A given *NP-cm NP-ga V* can be an instance of Surface OS or Deep OS, unless we place it in particular syntactic configurations; see Ueyama 1998: chap. 2, sec. 2.4, 2002: sec. 4. In a simple structure such as those discussed above, we cannot, strictly speaking, predict the availability of the BVA in (106c). The BVA in (107) is predicted to be unavailable only if the QP and B in (106c) are indeed co-arguments. To answer (109b) satisfactorily, we would need to address the so-called major subject construction (e.g., *John-ga musuko-ga sinda* '(roughly) it is John that (his) son died'), which we have suppressed in the preceding discussion and continue to do so for space reasons. While most speakers find BVA(QP, B) to be unavailable in (107), with a pair of NPs identified as in (108) and (109), the unavailability does not seem to be totally immune to judgmental fluctuation. The fluctuation can be

minimized by considering 'reconstruction effects of BVA', i.e., the availability of BVA(QP, B) in *B-ni/o QP-ga V*, but the space limitation prevents me from providing further discussion.⁶⁷

What is claimed about UG is (101), repeated here.

- (101) a. There is a relation of *Formal Dependency (FD)*.
 b. FD is a grammatical basis of one type of BVA.
 c. $FD(\alpha, \beta)$ is possible only if α c-commands β at LF, where α and β are both in A-positions.
 d. The 'value' of β of $FD(\alpha, \beta)$ is to be determined as being identical to that of α of the FD.

As suggested above, testable predictions can be made on the basis of (101)—in regard to a 'single structure'—only if we can identify BVA that *must* be based on FD, i.e., BVA(A, B) that is available only on the basis of $FD(t, B)$, with t being the trace of A, e.g., predictions in regard to 'reconstruction effects of BVA' and local disjointness effects. As illustrated in the preceding discussion, a pair of NPs can qualify as A and B of such BVA(A, B) only if all of (110) hold.

- (110) a. B is singular-denoting.
 b. A is not singular-denoting.
 c. A cannot be used to refer to a specific group.

The preceding discussion on BVA is in part an illustration of how such NPs have been identified. In the mid-1980s, *pro* was used as B of BVA(A, B). Because *pro* can be plural-denoting, however, it gave rise to the possibility of a group reading, and resulted in the failure to attain much repeatability. This led to the use of *so-ko*, which we have identified as being necessarily singular-denoting, on the basis of the split antecedence test. A problem remained, however, due to the possibility of the BVA that is not

⁶⁷ I provide a brief illustration of the relevant complications. We have noted above that (†) exhibits local disjointness effects.

(i) (Cf. (49a).)

*?*Toyota-sae-ga so-ko-ni toohyoosita* (koto)
 'even Toyota voted for it'

Some speakers, however, do not find the BVA in (i) totally unavailable and some even find it available fairly easily, contrary to the judgments reported in the foregoing discussion. Even those speakers who accept the BVA in (i), however, do not seem to accept the BVA in (ii).

(ii) **so-ko-ni Toyota-sae-ga t toohyoosita* (koto)
 that-place-DAT Toyota-even-NOM voted
 '(Lit.) for it, even Toyota voted t'

Incidentally, the unavailability of the BVA in (ii) cannot be attributed simply to the fact that *so-ko*-cm appears at the sentence-initial position in (ii), since the BVA in (iii) is much more readily available than that in (ii).

(iii) a. *so-ko-ni Toyota-sae-ga* [_{CP} *CIA-ga t nanika-o okuttekit*a to] *happyoosita* (koto)
 that-place-DAT Toyota-even-NOM CIA-NOM something-ACC sent that announced
 '(Lit.) to it, even Toyota announced that the CIA had sent t something'

b. *so-ko-ni Toyota-sae-ga* [_{CP} *Sony-ga t toohyoosita to*] *happyoosita* (koto)
 that-place-DAT Toyota-even-NOM Sony-NOM voted that announced
 '(Lit.) for it, even Toyota announced that Sony had voted t'

One possible account of (i), when the BVA therein is found to be available, is that it is analyzed as a major subject construction, analogous to (iv), with the embedded subject being an empty nominal.

(iv) *Toyota-sae-ga* [*so-ko-ga so-ko-ni toohyoosita*] (koto)
 'even Toyota is such that it voted for it'

Under such an account, the status of (ii) would be considered as analogous to that of (v).

(v) **so-ko-ni Toyota-sae-ga* [*so-ko-ga ec toohyoosita*] (koto)
 '(Lit.) for it, even Toyota is such that it voted ec'

contingent upon a structural relation between the 'binder' and the 'bindee'. The possibility of such BVA can be reduced considerably by using, as A of BVA(A, B), an NP that cannot seem to be used to refer to a specific group of entities. NPs such as *55.5% izyoo-no NP* '55.5% or more of the NPs' tend not to be usable in referring to a specific group, and experiments with such NPs yielded a higher degree of repeatability than before.

It is, however, not impossible to use such NPs to refer to a specific group of entities. For example, it seems that (111a) can be 'taken as' (111b), and, to the extent that it can, *55.5% izyoo-no NP* can give rise to the BVA that is not structurally based.

- (111) a. *55.5% izyoo-no kaisya*
'55.5% or more of the companies'
- b. *rei-no 55.5% izyoo-no kaisya*
(roughly) 'the group of companies under discussion that comprise 55.5% or more'

Some problems thus remain with NPs like *55.5% izyoo-no NP* '55.5% or more of the NPs' although they do yield a more reliable paradigm than other NPs such as *subete-no kaisya* 'every company, all companies', *5-tu-no kaisya* '5 companies', and *55%-no kaisya* '55% of the companies'.

It seems impossible to use *NP-sae* to refer to a specific group of entities. It is for this reason that we have used *NP-sae* in the preceding discussion, attaining a higher degree of repeatability than with NPs like *55.5% izyoo-no NP*. The speakers' judgments on the availability of BVA(*NP-sae*, B), however, appear to be not totally as predicted. This seems to be related to the fact that *-sae* 'even' can have an interpretation analogous to that with *-mo* 'also' in examples like (112), discussed in Kuroda 1965: chap. 3.

- (112) (Based on Kuroda 1965: chap. 3 (19), (20), and (23))
Uti-no ie-de-wa hitori musume-mo yatto yome-ni itta si ...
 home-GEN house-in-TOP only daughter-also finally bride-to went and
 'As to our family, our only daughter finally got married and ...'

To the extent that examples like (113) are acceptable, the relevant interpretation involving *NP-sae* 'even NP' can be more like (114a) than (114b), roughly speaking.

- (113) *Kuruma-ga kowarete, sai-hu-o nakusite, omake-ni ame-sae huri-hazime-ta.*
 car-NOM broke:and wallet-ACC lost:and addition-to rain-even fall-begin-past
 'The car broke down, the wallet got stolen, and it even started raining.'

- (114) a. (... NP ...)-even
 b. NP-even λx (... x ...)

That is to say, the interpretation of the relevant sentence in (113) is like "it even happened that rain fell" rather than "even rain (in addition to other things) fell," being analogous to the interpretation of (112), which does not mean "our only daughter as well as others in the family got married."

NPs such as *A toka dokoka toka* 'A and some other places' seem to be better suited for our purposes.⁶⁸ First of all, it is not singular-denoting. Second, the felicitous use of it seems to require that the speaker not quite know the entities that are 'referred to' by this NP, as illustrated in (115). This property seems to

⁶⁸ I have not used such NPs in the preceding discussion due to complications of their own that I do not have the space to address.

be related to the notion of 'a specific group of entities' in the context of BVA that is not structurally based.

(115) a. *?Toyota toka dokoka toka-ga Sony-o uttaemasita (yo).
Toyota and some:other:place-NOM Sony-ACC sued I:am:telling:you
'(I am telling you that) Toyota and some other companies sued Sony.'

b. Toyota toka dokoka toka-ga Sony-o uttaeta rasiidesu (yo)
Toyota and some:other:place-NOM Sony-ACC sued I:heard I:am:telling:you
'(I am telling you that) I have heard that Toyota and some other companies sued Sony.'

Cf. Toyota-ga Sony-o uttaemasita (yo). '(I am telling you that) Toyota sued Sony.'

Furthermore, *A toka dokoka toka* does not have the 'sentential scope' problem just noted in regard to *NP-sae*. It thus seems at the moment that *BVA(A toka dokoka toka, so-ko)* can serve our purposes best.⁶⁹

As in any other theory of grammar, the proposed theory is intended to capture and express how (i) a certain set of the speaker's linguistic intuitions reflect (ii) a certain aspect(s) of his/her grammar. It is meant to do so by characterizing and relating (i) and (ii) by means of theoretical postulates and hypotheses such as c-command, FD and a particular view of the structural properties of the relevant aspects of Japanese sentences both in the OSV as well as the SOV orders. According to the proposed theory, *BVA(A, B)* in (116b), must be an instance of *pure BVA*. Let us assume that the lexical items are constant in the relevant examples schematized in (116), (117) and (118), not only for A and B but also for the elements elsewhere in the structures.

(116) a. [... B ...]-ga A-cm V **BVA(A, B)*⁷⁰
b. [... B ...]-cm A-ga V *BVA(A, B)*

(117) A-ga [... B ...]-cm V

(118) A-ga B-cm V

If the pattern of judgments in (116) is observed for a given speaker, it is predicted that the same speaker would also accept the *BVA* in (117).⁷¹ Note, however, that the availability of *BVA(A, B)* in (116b) does not mean that *BVA(A, B)* in (117) must be based on FD; it only indicates that it can. This in turn means that *BVA(A, B)* need not be based on FD. It is therefore not predicted that the same speaker would fail to accept the *BVA* in (118), in contrast to (117b).⁷² It is predicted, on the other hand, that the same

⁶⁹ In addition, *A toka dokoka toka* proves to be useful when we consider 'spec-binding' cases for which the 'floating quantifier' cannot be used and *NP sae* seems highly marginal.

⁷⁰ "*" here means that *BVA* is not found to be available.

⁷¹ If one 'translates' (117) into English, one might find the relevant prediction to be trivial, since the *BVA* is readily available in the English examples corresponding to (117), as long as a third person pronoun is used as B in (117). The prediction is not trivial in a language like Japanese, however, where the availability of the *BVA* in (117) (and, in fact, in any other linguistic environment) is not as readily available as in English; see also footnote 72.

⁷² As discussed in Hoji 1995, 1998a, and hinted at in the earlier discussion (see (49) and footnote 31), it is not the case that examples of the form in (i) always exhibit local disjointness effects.

(i) *NP-ga so-ko-o/ni V* (e.g., *Toyota-ga so-ko-ni toohyoosita* (koto) 'Toyota voted for it')

speaker would fail to accept the BVA in (119), in contrast to (116b) and (117), because BVA(A, B) in (119) must be based on FD; see (103).

(119) B-cm A-ga V

Counter-evidence to the aspect of the proposal just mentioned therefore would have to take a form of a combination of judgments on certain sentence forms with regard to the availability of BVA, and our proposal would be falsified by such counter-evidence. As noted earlier, it is the predicted correlations of judgments, more than anything else, that make our proposal falsifiable; see the discussion in section 3.2.

It is perhaps not possible to make every aspect of our theory empirically falsifiable at a given (or possibly any) stage of theory construction; but those aspects of the theory that are not empirically falsifiable must serve to render it possible for us to make definite predictions. The relevant distinction would show up perhaps most straightforwardly if we consider the distinction between a hypothesis about the properties of UG and one about a specific aspect of a particular language. The former is often not empirically falsifiable, at least in a way addressed in the preceding discussion. The latter on the other hand is of a different nature. It is the falsifiability of the latter that makes us hopeful that we will someday be able to make our hypotheses about UG falsifiable. If the latter is not empirically falsifiable, we do not seem to have the chance to make our hypotheses about UG empirically falsifiable.⁷³ In the context of the preceding discussion, I would now like to turn to a language-particular hypothesis that *otagai* in Japanese is a local anaphor.

4.2. On *otagai*—the so-called local reciprocal anaphor in Japanese

In this subsection, I will consider the validity of the widely accepted assumption that *otagai* is a local (reciprocal) anaphor. Most of the materials below are taken from Hoji 1998d. The aim of this subsection is not to provide a full analysis of *otagai* but to provide further illustration of the significance of repeatability and falsifiability.

4.2.1. The standard assumption

In the generative tradition, it is almost universally assumed that *otagai* in Japanese is a reciprocal anaphor corresponding to English *each other*, i.e., a local anaphor. The distribution of *otagai* and 'its antecedent' as analyzed under this assumption has been used by a number of researchers on various topics, notably on the topic of so-called scrambling in Japanese; cf. Yang 1984, Kitagawa 1986, Nishigauchi 1992, Saito 1992, and Miyagawa 1997, just to mention a few. Let us record the standard assumption/hypothesis in (120).

(120) Standard Assumption/Hypothesis:

Otagai is a local anaphor.

Some of the most elementary predictions made by (120) are given in (121), given the standard characterization of the properties of local anaphors.

(121) Predictions made by (120):

- a. *Otagai* requires a linguistic antecedent.
- b. *Otagai* must be c-commanded by its antecedent.

This contrasts sharply with (ii) in English.

(ii) NP V *it* (e.g., Toyota voted for it)

The contrast between (i) and (ii) is discussed in some depth in Hoji 1995, 1998a.

⁷³ Recall that certain aspects of our proposal are not empirically motivated yet, e.g., the PF movement analysis of the reconstruction effects of BVA in the OSV order (see footnote 24). It is important to recognize, however, that it does enable us to make definite predictions, thereby rendering our proposal falsifiable.

- c. *Otagai* must be c-commanded by its antecedent in its local domain.
- d. Split antecedence is not possible for *otagai*.

The contrast in (122), in particular the status of (122b), has been taken as evidence that *otagai* must be c-commanded (or more precisely, must be A-bound) by its antecedent; see (121b).

- (122) a. (Saito 1992: (12b))
 [Karera₁-ga [otagai-o hihansita]] (koto)
 they-NOM each:other-ACC criticized fact
 'They₁ criticized each other₁'
- b. (Saito 1992: (13b))
 ?*[[Otagai-no sensei]-ga [karera₁-o hihansita]] (koto)
 each:other-GEN teacher-NOM they-ACC criticized fact
 'Each other's₁ teachers criticized them₁'

The claim that the antecedent of *otagai* must be in the local domain of the latter (see (121c)) has been based on the alleged unacceptability of examples like (123).⁷⁴

- (123) (Ishii 1990: 151 (12b), based on Yang 1983: 173 (21))
 *karera₁-ga [Mary-ga otagai-o aisiteiru to] it-ta
 'they₁ said that Mary loves each other₁'

As we will observe directly, (120) fails to attain repeatability, rather remarkably.

4.2.2. Repeatability problems

While the judgments as reported in (122b) and (123) have been widely adopted, without serious challenge, at least in the published works, it is quite easy to construct examples in which *otagai* and 'its antecedent' can be anaphorically related despite the fact that *otagai* and 'its antecedent' are in exactly the same structural relations as in (122b) and (123).⁷⁵

- (124) a. [otagai-no koibito]-ga [John to Bill]₁-o yuuwakusita
 otagai-GEN lover-NOM [John and Bill]-ACC seduced
 (to yuu uwasa-ga matizyuu-no wadaï-ni natte ita)
 '(The rumor that) each other₁'s lovers seduced [John and Bill]₁ (had become a hot topic of the town.)'
- b. [otagai-no koibito]-ga [John to Bill]₁-ni iiyotta (koto)
 otagai-GEN lover-NOM [John and Bill]-DAT tried:to:seduce (fact)
 'John's lover tried to seduce Bill, and Bill's lover tried to seduce John.'
- (125) a. [John to Bill]₁-wa [_{CP} Mary-ga otagai-ni horeteiru to] omoikondeita
 [John and Bill]-TOP [Mary-NOM otagai-DAT is:in:love that] believed

⁷⁴ Saito (1992, footnote 6) attributes to Yang 1984, Ueda 1984, and Kitagawa 1986 the observation that *otagai* exhibits the Specified Subject Condition effects and has the binding properties of an anaphor.

⁷⁵ Many speakers even find (122b) and (123) to be acceptable with the relevant anaphoric relation.

'[each of John and Bill] believed that Mary was in love with the other.'
 '[each of John and Bill]₁ believed that Mary was in love with him₁.'

- b. [John to Bill]₁-wa [_{CP} Chomsky-ga naze otagai_i-o suisensita no ka]
 [John and Bill]-TOP [Chomsky-NOM why otagai-ACC recommended Q]

wakaranakatta
 did:not:understand

'[each of John and Bill] had no idea why Chomsky had recommended the other.'
 '[each of John and Bill]₁ had no idea why Chomsky had recommended him₁.'
 '[John and Bill]₁ had no idea why Chomsky had recommended them₁'

The acceptability of examples like (124) and (125) disconfirms the predictions in (121b) and (121c).

The fact that we can construct examples in which the antecedent of *otagai* is not expressed linguistically disconfirms (121a).⁷⁶

- (126) a. Otagai-ga manzoku nara, boku-wa monku-o iwanai tumorida.
 otagai-NOM satisfied if I-TOP complaint-ACC say:not intend

'I will not complain if those two feel happy.'

- b. Haru-no atatakana kaze-ga otagai-o totemo siawase-na kimoti-ni sita.
 spring-GEN warm wind-NOM otagai-ACC very:much happy feeling-to made

'The warm spring breeze made the two feel very happy.'

The English translations of (126) become degraded and contrast sharply with (126) if the subject of the embedded sentence is changed to *each other* (with the concomitant change of *feel* to *feels* in the case of the translation of (126a)).

Furthermore, 'split antecedence' is allowed for *otagai*, as illustrated in (127) and (128).

- (127) a. Ieyasu₁-wa Nobunaga₂-ni [Singen-ga sineba [otagai_{i+2}-no ryoodo]-ga
 Ieyasu-TOP Nobunaga-DAT [Shingen-NOM die:if otagai-GEN territory-NOM

sibarakuwa antaida to] tugeta
 for:a:while is:safe that] told

'Ieyasu₁ told Nobunaga₂ that, if Shingen dies, their₁₊₂ territories will be safe for a while'

- b. Ieyasu₁-wa Nobunaga₂-ni [Singen-ga otagai_{i+2}-o hometeita to] tugeta
 Ieyasu-TOP Nobunaga-DAT [Shingen-NOM otagai-ACC was:praising that] told

'Ieyasu₁ told Nobunaga₂ that Shingen was praising them₁₊₂'

- (128) [subete-no Kyuusyuu-no daimyoo]₁-ga [Sikoku-no dokoka-no daimyoo]₂-ni
 all-GEN Kyushu-GEN war:lord-NOM Shikoku-GEN some:place-GEN war:lord-DAT

[Singen-ga otagai_{i+2}-o hometeita to] tugeta (koto)
 [Shingen-NOM otagai-ACC was:praising that] told (fact)

'[every feudal king in Kyushu]₁ told [a feudal king of some place in Shikoku]₂ that Shingen was

⁷⁶ (126a) is due to Ayumi Ueyama (p.c. February 2002).

praising them₁₊₂'

The impossibility of split antecedence is generally regarded as a defining property of an anaphor, and the behavior of *otagai* sharply contrasts with that of English *each other*.

(129) *John₁ told Bill₂ that Mary was praising each other₁₊₂

(130) *[every feudal king in Kyushu]₁ told [a feudal king of some place in Shikoku]₂ that Shingen was praising each other₁₊₂

Thus the prediction in (121d) has also been disconfirmed.

The observations given above are summarized in (131); see (121).

(131) Summary of the observations (based on Hoji 1998d):

- a. The antecedent of *otagai* need not be expressed linguistically.
- b. The antecedent of *otagai* need not c-command *otagai* (as long as the relevant anaphoric relation is that of coreference).
- c. The antecedent of *otagai* need not be in the local domain of *otagai*.
- d. 'Split antecedence' is possible for *otagai* (not only for coreference but also for BVA).

These observations suggest that *otagai* is not even an anaphor, let alone a *local* anaphor.^{77, 78}

4.2.3. Falsifiability

One may make reference to the fact that there are non-anaphor instances as well as anaphor instances of *each other* in English as well, and suggest that there may be a local anaphor use of *otagai* as well as other use(s) of *otagai*. In other words, one might suggest that (i) the discussion of *otagai* in the relevant literature focuses on the local anaphor use of *otagai*, (ii) *otagai* in the counter-examples to (120) given in the preceding subsection (and many others in Hoji 1998d) are non-anaphor instances of *otagai*, and (iii) once we focus on the local anaphor *otagai*, the generalization indicated in (120) can be maintained. The problem with such an attempt to save (120) is that it is not demonstrable, as far as I can tell, that there are two types of *otagai*. According to Pollard and Sag 1992, there is a syntactic environment in which only the anaphor *each other* can occur and the "exempt anaphor" *each other* cannot, namely, in an argument position. In many of the Japanese examples given above, *otagai* appears in what is generally understood to be an argument position (e.g., the positions of a subject and an object). Thus even if we confine our discussion to *otagai* in an argument position, it does not behave like a local anaphor. In fact, there does not seem to be any syntactic environment in which only the 'local anaphor' *otagai* could appear and the 'other *otagai*' could not if there were indeed two types of *otagai*. The suggestion of the sort just

⁷⁷ Miyagawa 1997 provides a different set of empirical materials that purportedly show that *otagai* is an anaphor. The space limitation, however, prevents me from discussing it fully, and I can only note here that the relevant empirical paradigms there also seem to suffer from problems of essentially the same nature as those discussed in this section.

⁷⁸ As discussed in Hoji 1998d in some depth, the level of repeatability in regard to (120), which seems to be even lower than that of the BVA-based argument for ACH presented in the mid-1980s (see section 2.3.1), can be raised to some extent if we consider the distribution of what appears to be BVA involving *otagai*. *Otagai* is analyzed in Hoji 1998d as containing *pro*, as in [*pro otagai*], being analogous to a kinship term such as *titiyoa* 'father' and, according to the proposal therein, the relevant BVA is BVA(QP, *pro*) rather than BVA(QP, *otagai*). As we have seen, BVA(QP, *pro*) has a problem due to the possibility of *pro* to be plural-denoting. Hence, there is serious limitation to how much repeatability can be attained even if we concentrate on the distribution of BVA involving *otagai*.

mentioned would therefore make (120) not falsifiable.⁷⁹

Consider again (120) and the predictions in (121), repeated here.

(120) Standard Assumption/Hypothesis:

Otagai is a local anaphor.

(121) Predictions made by (120):

- a. *Otagai* requires a linguistic antecedent.
- b. *Otagai* must be c-commanded by its antecedent.
- c. *Otagai* must be c-commanded by its antecedent in its local domain.
- d. Split antecedence is not possible for *otagai*.

(120) is a language-particular hypothesis that the linguistic object that is phonetically realized as *otagai* has certain formal properties, with the consequences in (121). One can make further hypotheses on the basis of (120), just as one can make language-particular hypotheses (in part) on the basis of a hypothesis about UG.

As we have observed above, the predictions made by (120) fail to be borne out, and it is furthermore not clear to me how the 'counter-examples' can be characterized (e.g., as forming some natural classes).⁸⁰

⁷⁹ Whether *otagai* yields a reciprocal, a 'respective', or a group interpretation does not seem to be correlated, in any systematic way, with the position where it appears, and it does not seem possible to identify local anaphor *otagai* along that line, either.

⁸⁰ We have seen that *each other* in English and *otagai* in Japanese do not seem to share the formal properties that would reveal the nature of the language faculty, despite the fact that they apparently can be used to express the 'same intention'. It is of some interest to note that essentially the same point is made in Chomsky 1976: 181-183 on the basis of some empirical considerations of *each other* and *the other(s)*. Consider (i) and (ii).

- (i) (Chomsky 1976: 181, (21))
 - a. the men like each other
 - b. the men want [John to like each other]
 - c. the men seem to John [*t* to like each other]
 - d. John seems to the men [*t* to like each other]
- (ii) (Chomsky 1976: 181, (22))
 - a. each of the men likes the other(s)
 - b. each of the men wants [John to like the other(s)]
 - c. each of the men seems to John [*t* to like the other(s)]
 - d. John seems to each of the men [*t* to like the other(s)]

(Though Chomsky does not provide the 'grammaticality/acceptability' markings on the examples in (i)-(ii), the discussion therein indicates that (i-b) and (i-d) are understood to be clearly degraded, in contrast to (i-a) and (i-c).) He remarks as follows.

- (iii) (Chomsky 1976: 181-182)

The sentences of [(ii)] are fully grammatical. [(ii-a)] is similar if not identical in meaning to (i-a), and there seems to be no independent semantic principle that explains why [(i-b-d)] should not be correspondingly related in meaning to [(ii-b-d)] ...

There is thus a clear difference between (iv-a) and (iv-b) and Chomsky asks whether "we can find a principled difference between the two cases," and answers as in (v). (p. 182)

- (iv) a. the relation between *each other* and 'its antecedent'
- b. the relation between *the others* and 'its antecedent'

- (v) (Chomsky 1976: 182)

The answer is obvious. Reciprocal interpretation and DR (Disjoint Reference, HH) are rules of sentence-grammar; the rule interpreting *the others* is not.

In support of (v), Chomsky provides (vi).

One might suggest that the existence of (numerous) examples that do not verify the predictions in (121) does not necessarily falsify the language-particular hypothesis in (120) because, just as the LF c-command-based condition on BVA is a condition on *pure BVA* and not a condition on any instance of BVA, so (120) is a hypothesis about the local anaphor instance of *otagai* and not a hypothesis on any instance of *otagai*. We have, however, seen that such a suggestion makes the hypothesis in question not falsifiable. The crucial difference between the two cases under discussion is that independent means have been proposed to distinguish *pure BVA* from *pseudo-BVAs*, but no independent means have been proposed, and it in fact does not seem possible, to distinguish the anaphor *otagai* from the non-anaphor *otagai*.

I have noted above that we may have to work with hypotheses about UG that are not empirically falsifiable, at least at some stage of our theory construction. We are perhaps justified to do so, provided that language-particular hypotheses are made falsifiable on the basis of such hypotheses about UG. If a language-particular hypothesis is constructed crucially based on another language-particular hypothesis that is not falsifiable, however, the latter does not serve to make the former falsifiable. A serious problem therefore seems unavoidable if one bases hypotheses on a language-particular hypothesis that is not falsifiable.

It is not difficult to come up with examples that are consistent with (121a). For example, there is a clear contrast between (132) and (133).

(132) #Hora, John-ga otagai-o hometeiru.
 look John-NOM otagai-ACC is:praising
 'Look, John is praising each other/them.'

(133) Hora, John to Bill-ga otagai-o hometeiru.
 look John and Bill-NOM otagai-ACC is:praising
 'Look, John and Bill are praising each other/them.'

One might take the status of (132) in contrast to (133) to be evidence *verifying* the hypothesis in (120). Given that the status of (134a) is consistent with (121b), one might also consider the contrast in (134) to be evidence for (120).⁸¹

(134) a. #otagai_i-no koibito-ga [John to Bill]₁-no titioya-o yuuwakusita (koto)
 otagai-GEN lover-NOM John and Bill-GEN father-ACC seduced

(vi) (Chomsky 1976: 182, (23))

- a. Some of the men left today. The others will leave later.
- a'. Some of the men left today. Each other will leave later.
- b. Some of the articles are incomprehensible, but we each expected John to understand the others.
- b'. Some of the articles are incomprehensible, but we each expected John to understand each other.

He then remarks:

(vii) (Chomsky 1976: 182-183)

The examples in [(vi-a')] and [(vi-b')] are ungrammatical. The rule of interpretation, being a rule of sentence-grammar, is inapplicable in case [(vi-a')] and is blocked by SSC in [(vi-b')]. The rule assigning an interpretation to *the others*, however, is not a rule of sentence-grammar at all, as [(vi-a)] indicated. Thus it is not subject to the conditions of sentence-grammar, so that [(vi-a, b)] are as grammatical as [(ii-b, d)]

Similarities between *the other(s)* and *otagai* are fairly clear, and the point in the first sentence in footnote 78 seems to apply to *the other(s)* as well.

⁸¹ Even those speakers who accept (122b) as well as (124) seem to find (134a) to be unacceptable.

'each other's lovers seduced John and Bill's fathers'

- b. [Mary to Susan]₁-ga otagai₁-no koibito-no titioya-o yuuwakusita (koto)
Mary and Susan-NOM otagai-GEN lover-GEN father-ACC seduced
'Mary and Susan seduced each other's lovers' fathers'

It is thus possible to find empirical materials that are consistent with (some of) the predictions in (121). This is not surprising. Popper (1959) warns that "it is always deceptively easy to find *verifications* of a theory." What is predicted by (120) is not (135a) but (135b).

- (135) a. There are empirical materials that are consistent with (121).
b. There are no empirical materials that are not consistent with (121).

The intent of Popper's remark that "we have to adopt a *highly critical* attitude towards our theories if we do not wish to argue in circles: the attitude of trying to *refute* them" seems to be precisely this—in the context of the present discussion.⁸²

5. Concluding Remarks

The main concern of this paper is how we (can) attain repeatability and falsifiability in generative grammar, and I started with the intuitive understanding in (1), repeated here.

- (1) a. A proposal α is *falsifiable* iff α makes a prediction that can be confirmed or disconfirmed.
b. An outcome β of an experiment confirms a prediction γ iff β is in accordance with γ ; β disconfirms γ otherwise.
c. *Repeatability* (or *Reproducibility*) is attained to the extent that an outcome of an experiment that confirms the prediction is *repeated* (or *reproduced*).

The empirical discussion in this paper is meant to be part of an attempt to articulate how the notions in (1) are to be understood in the context of generative grammar.

The central empirical arguments for the standard view of the basic structural properties of Japanese, which we have called ACH (the asymmetrical c-command hypothesis) come from the (un)availability of BVA and the quantifier scope interpretations. I have argued that we can attain a sufficient degree of repeatability only if we confine our discussion to the (un)availability of the type of BVA and the type of DR that are sensitive to LF c-command. I have also argued that much of the judgmental fluctuation and instability observed in regard to the empirical paradigms can be considered as expected, given the theoretical characterization of FD-based (i.e., LF c-command-based) BVA presented above.

I take the major goal of generative grammar to be a comprehension of the connection between the sense experiences as reflections of the language faculty, "by the use of a minimum of primary concepts and relations." What is meant by the language faculty here is (ultimately) UG. Our sense experiences in question, however, do not necessarily reflect the properties of UG, at least in any transparent fashion. One thus makes hypotheses about UG on the basis of results from empirical investigation of a particular language, while making reference to, and in fact making use of, hypotheses about the properties of UG

⁸² The relevant passage is given in (i).

- (i) [O]bservations, and even more so observation statements and statements of experimental results, are always *interpretations* of the facts observed; that they are *interpretations in the light of theories*. This is one of the main reasons why it is always deceptively easy to find *verifications* of a theory, and why we have to adopt a *highly critical* attitude towards our theories if we do not wish to argue in circles: the attitude of trying to *refute* them. Popper (1959: 107, footnote *3)

that have been deduced in investigating the workings of the grammar of a particular language. As Chomsky (1981: 6) seems to suggest, proposals concerning the properties of UG can be empirically evaluated "only to the extent that we have grammatical descriptions that are reasonably compelling in some domain," and the present work, which concentrates on empirical materials in Japanese, is an attempt to provide such grammatical descriptions in terms of a fairly small number of theoretical concepts and relations.

The space limitation has imposed a severe constraint on how much material to include as well as how much elaboration to provide on the relevant concepts and relations, along with the empirical evidence in support of their postulation; and what has been presented is only a partial articulation of the relevant notions in (1). For example, although a number of experiments have been discussed, I did not address what basic structure an *experiment* in generative grammar would have to take, the question that might be crucial in articulating *repeatability* and *falsifiability* in generative grammar; see Popper 1959: 107-108 for some relevant remarks.⁸³

There are also a number of questions that remain to be addressed and I can only mention a few of them here.⁸⁴ One may, for example, ask, naturally in the context of the preceding discussion, whether the so-called reflexives in Japanese (e.g., *zibun* and *zibun-zisin*) can be used in our experiments in a way that can be meaningful and reliable. The space limit makes it impossible to do justice to the complex empirical, conceptual as well as methodological issues surrounding the question, and I will only make two very brief remarks here. First of all, the assumption/hypothesis that *zibun* and *zibun-zisin* are (local) anaphors seems to face a serious repeatability problem once we articulate what predictions it makes and conduct the relevant experiments; cf. section 4.2. Such a result furthermore does not seem to be unexpected if the theoretical characterization of *anaphors* is in terms of grammatical agreement features; that is to say, if grammatical agreement features are totally absent in the Lexicon of Japanese, as suggested by the works by Fukui 1986 and Kuroda 1988, under a fairly natural interpretation of their proposals (see Hoji 1998b), the absence of *anaphors* in Japanese is what we expect.⁸⁵

⁸³ A plausible characterization of it, suggested by Ayumi Ueyama (p.c. January 2002), is that the basic structure of an experiment in generative grammar, at least in the areas that we have been concerned with, involves a pair of phonetic strings (or their variants). Under this conception, it would not count as an experiment if one presented a particular phonetic string to a native speaker (including the researcher him/herself) and asked about its acceptability or its compatibility with a certain situation. An elaboration on, and an articulation of, this idea in the context of the present discussion would require substantial space, and further discussion cannot be provided here.

⁸⁴ One of the remaining issues concerns the availability of BVA in (i).

(i) [... *QP* ...]-ga [... {*so-ko/so-no NP*} ...]-o/ni V
 -NOM that-place/that-GEN -ACC/DAT

(ii-a) and (ii-b) are two instances of (i).

(ii) a. [_{NP} *QP-no NP*]-ga [_{NP} ... {*so-ko/so-no NP*} ...]-o/ni V
 -GEN -NOM that-place/that-GEN -ACC/DAT

b. [_{NP} [_{IP} ... *QP* ...]]-ga [_{NP} ... {*so-ko/so-no NP*} ...]-o/ni V

While (ii-b) seems to allow only the 'precedence-based BVA', as argued in Ueyama 1998: chap. 3, (ii-a) seems to give rise to FD-based (i.e., LF c-command-based) BVA as well as the 'precedence-based BVA', provided that the 'semantic content' of the 'dependent term' is understood to be 'small enough' in the case of the former. The availability of the FD-based BVA in (ii-a) is in fact mirrored by that of the FD-based sloppy identity readings in such 'Spec-binding' configurations (see Reinhart 1987 and the references therein), and sharply contrasts with the lack thereof in configurations like (ii-b), as discussed in Hoji 2002. How to accommodate the FD-based BVA in such 'Spec-binding' cases in the theory pursued here is certainly a nontrivial issue, as it has in fact remained as a recalcitrant problem over the past 20 years in the generative tradition. I intend to address the issue in a separate work.

⁸⁵ Similarly, if the theoretical characterization of *pronouns* is also in terms of grammatical agreement features, as

One might have gotten the impression that the use of an NP that is not a quantifier in its standard sense (e.g., *NP-sae* 'even NP' and *A toka dokoka toka* 'A and some other places') is crucial in the experiments to test the predictions made by the proposal advanced here. Such an impression could have been avoided if we had been able to discuss more involved experiments conducted in works in Ueyama 1998, in press, Hayashishita forthcoming, and Hoji & Ueyama 1998, in which the (un)availability of two or more DRs/BVAs (including the combination of a DR and a BVA) is examined, sometimes in the so-called multiple scrambling constructions, and furthermore with 'resumption' in some cases. The results of the experiments in these works suggest that we can clearly observe the involvement of FD for BVA with NPs that appear to be a quantifier such as *subete-no NP* 'every NP' and that the proposed theory of BVA can be made to be falsifiable without using an NP that is not a quantifier in its standard sense.⁸⁶

Poincaré 1952 remarks:

- (136) [U]nder what conditions is the use of hypothesis without danger? The proposal to submit all to experiment is not sufficient. Some hypotheses are dangerous, — first and foremost those which are tacit and unconscious. And since we make them without knowing them, we cannot get rid of them. Here again, there is a service that mathematical physics may render us. By the precision which is its characteristic, we are compelled to formulate all the hypotheses that we would unhesitatingly make without its aid.⁸⁷ (Poincaré 1952: chap. 9, 151)

suggested in Postal 1969 concerning pronouns in English, it also follows that we do not expect to find *pronouns* in Japanese, either. See the second paragraph in footnote 10.

⁸⁶ One such experiment is schematically illustrated below; see Ueyama 1998: section 2.4.2, 2002: 4.2 for related experiments. Suppose that there is evidence that $BVA(QP_1, B_1)$ in (i) must be FD-based for a speaker.

- (i) QP_1 -cm [... B_1 ... B_2 ...]-cm QP_2 -ga V
 $BVA(QP_1, B_1)$ and $BVA(QP_2, B_2)$

If both $BVA(QP_1, B_1)$ and $BVA(QP_2, B_2)$ are available for this speaker, $BVA(QP_2, B_2)$ must be based on FD, regardless of the type of NP used as the *QP*. First of all, it cannot be the BVA that is sensitive to PF precedence since the *QP* does not precede the 'dependent term'. Second, it cannot be the BVA that is not structurally based for the following reason. The availability of $BVA(QP_1, B_1)$ makes it necessary for the QP_1 in (i) to occupy what Ueyama 1998, 2002 calls the Deep DL position, i.e., the A-position outside the theta domain of the verb. The BVA that is not structurally based, however, is not possible in a configuration in which a Deep DL position is lexically filled, as observed in Ueyama 1998: Appendix D.2. Hence $BVA(QP_1, B_1)$ and $BVA(QP_2, B_2)$ cannot be available simultaneously, if $BVA(QP_1, B_1)$ must be FD-based. That is to say, if $BVA(QP_2, B_2)$ in (i) could be BVA that is not structurally based, $BVA(QP_2, B_2)$ should be available in (ii) along with $BVA(QP_1, B_1)$.

- (ii) QP_1 -cm [... B_1 ... B_2 ...]-ga QP_2 -cm V
 $BVA(QP_1, B_1)$ and $BVA(QP_2, B_2)$

Since the two BVAs cannot be available simultaneously, we are led to conclude that $BVA(QP_2, B_2)$ in (i) must be based on FD, even when the QP_2 is *subete-no NP*, for example.

⁸⁷ Poincaré immediately follows this with (i).

- (i) Let us also notice that it is important not to multiply hypotheses indefinitely. If we construct a theory based upon multiple hypotheses, and if experiment condemns it, which of the premises must be changed? It is impossible to tell. Conversely, if the experiment succeeds, must we suppose that it has verified all these hypotheses at once? Can several unknowns be determined from a single equation? (Poincaré 1952: chap. 9, 151-152)

Suppose that one offers an account of some empirical materials (i.e., a certain set of sense experiences), by using numerous assumptions, or without a clear articulation of how a theoretical concept or relation is related to a particular (set of) linguistic intuitions. If the predicted judgment does not obtain in such cases, it will be difficult, if not impossible, to identify what aspect(s) of the proposal must be modified or rejected. For works of this kind, so-called counter-examples to the proposed generalizations are something that is to be abhorred and they are often, if not generally, put aside as some marked phenomena, not constituting the 'core paradigm of theoretical significance'. (What appears to me to be a misconception of the notion *theoretical* also seems to contribute to the problem

It seems clear that in generative grammar we cannot have the service that mathematical physics may render us and we would have to seek an alternative to mathematical physics as what provides us with the precision we need. At the moment, the only alternative available in generative grammar is a rigorous attempt to articulate every theoretical concept we postulate/adopt in regard to (i) how it is related to the rest of the theory and (ii) how it is related (no matter how indirectly) to the linguistic intuitions of the speaker of a given language, so as to be able to conduct experiments to test the predictions made by our hypotheses, thereby ensuring the falsifiability of our hypotheses as best as we can. What has been presented above is far from being satisfactory as to the level of articulation in this respect. I nonetheless hope to have illustrated with a modest degree of success how we might proceed to attain repeatability and falsifiability in generative grammar as an empirical science.

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addressed here and it deserves serious discussion; I wish to return to the relevant issues in a separate work.) If each theoretical concept and relation are tightly (although often indirectly) connected to a particular (set of) linguistic intuitions, on the other hand, judgments contrary to our predictions, i.e., counter-evidence, are likely to lead to a new discovery, a better understanding, and an improved hypothesis; see Poincaré 1952: chap. 9, 150-151.

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