1. **Overview**

Anaphora is a process of resolving the interpretation of some expression that requires more than access to the expression's lexical semantics. Taken in its broadest sense, it is that process which determines whether a given occurrence of *he* is to refer deictically to an individual being pointed at, is to refer to a person previously mentioned in the discourse, is to function as a variable bound by some preceding quantifier or is to be interpreted in some other way. The recognition that many processes of anaphora are affected by the syntactic relation that obtains between an anaphoric expression and some antecedent expression has led to a wide range of syntactic theories whose aim is to clarify what the exact structural relations are that make anaphora possible. Starting with Reinhart (1983), the question of how anaphora is resolved semantically has come to be seen as a central part of any explanation of how anaphora works. Ueyama's dissertation contributes to both the syntax and semantics of anaphora by examining properties of Japanese anaphora at a finer level of detail than has been done before within the generative literature.

The greatest strength of Ueyama's dissertation is its careful construction of a paradigm of anaphoric possibilities in scrambling and non-scrambling constructions. Ueyama systematically lays out a paradigm that controls not only for differences in structure but also for differences in anaphoric expressions and in their antecedents. By paying attention to the fine details of the connection between anaphoric expressions and their antecedents, she is able to show that there are several different relations which can be called anaphoric, and that each has its own structural and interpretational properties.

In addition to creating a paradigm that promises to remain central to studies of anaphora, Ueyama also constructs a conceptually simple and yet far reaching analysis of the paradigm. The formal details of the analysis remain sketchy in many places though the core part of the analysis that she has worked out is highly promising, as are the directions she suggests for completing the analysis. For anyone interested in doing serious work on Japanese anaphora or in reconsidering the foundations of anaphora, this dissertation is well worth reading.

2. **Scrambling**

One of Ueyama's main claims regarding anaphora is that covariance between an anaphor and an antecedent, or what she refers to as BVA (a descriptive term used
non-technically to refer to the covariance typically taken to involve Bound Variable Anaphora), can be licensed either by an anaphoric relation based on c-command at LF or by a separate one based on precedence at PF. In order to substantiate this claim, it is necessary to be able to independently determine when the relevant c-command and precedence relations obtain. Precedence is presumably established independently by word order in the utterance. For sentences involving dislocation (=scrambling), LF c-command is less straightforward. Chapter 2 of her dissertation is devoted to establishing what c-command relations obtain for such sentences.

Ueyama proposes that there are two types of scrambling (OS) constructions, given in (12) and (13) in her summary above. In contrast to other works on scrambling such as Mahajan (1990), Saito (1992), and Miyagawa (1997), Ueyama does not assume an additional A/A’ distinction in the positions occupied by an overtly dislocated expression. Still, she shows that her analysis can account for three main effects that have posed a challenge to analyses of scrambling: the distribution of Weak Crossover (WCO) effects, Reconstruction effects, and Scope effects. In the Deep-OS construction she gives in (12), the dislocated phrase (DL) is base-generated in its surface position and associated with a θ-position via an empty operator that raises from the θ-position. Since the DL remains in its dislocated position at LF, it c-commands the subject at LF. From this position, a QP can thus bind (=be the antecedent in an FD relation of -- see below) an anaphoric expression contained in the subject (1a), and take wide scope over the subject (1b). 

(Underlining is for anaphora, coindexing for movement.)

(1)
a. Toyota-sae-o Op_i [so-ko-o tekitaisositeiru
Toyota-even-ACC that-place-ACC be:hostile
kaisya]-ga ei uttaeta
company-NOM sued
Even Toyota the company which is hostile to it sued.

b. [Sake to biiru]-o Op_i [John ka Bill]-ga ti
sake and beer-ACC John or Bill-NOM
nonda (rashii)
drank seem
(It seems that) sake and beer, John or Bill drank.
([sake to biiru] > [John ka Bill])

WCO effects are presumably taken to result from illicit dependencies between an anaphoric expression and its
antecedent, and in (1a) there is no problem establishing a dependency.

Reconstruction effects (2a-c) as well as narrow scope readings for dislocated QPs (2d) are derived from the surface OS construction given in (13) of Ueyama's summary above. In this construction, the DL is taken to be base generated in its 0-position and moved to its surface position in the PF component. The reconstruction effects captured include binding of a pronoun in DL by a subject QP (2a), absence of Condition C effects (2b), and interpretation of a wh-expression in the scope of its binding Q-morpheme (2c).

(2)

a. PF: \[So-ko-o tekitaisisiteiru kaisya]-o\_i  
   that-place-ACC be:hostile company-ACC  
   Toyota-sae-ga \( t_i \) uttaeta  
   Toyota-even-NOM sued  
   LF: Toyota-sae-ga \[So-ko-o tekitaisisiteiru kaisya]-o uttaeta\  
   The company which is hostile to it, even Toyota sued.

b. PF: Zibunzisin-o\_i \[Hanako-ga \( t_i \) hihansita\] (koto)  
   self-ACC Hanako-NOM criticized fact  
   LF: \[Hanako-ga Zibunzisin-o hihansita\] (koto)  
   (the fact that) Herself, Hanako criticized

c. PF: Dare-ni\_i Mary-ga [CP \[John-ga \( t_i \) Susan-o \  
   who-DAT Mary-NOM John-NOM Susan-ACC \  
   syookaisita] \( \text{ka} \) siritagatteiru (koto) \  
   introduced Q want:to:know fact  
   LF: Mary-ga [CP \[John-ga Dare-ni Susan-o \  
   syookaisita] \( \text{ka} \) siritagatteiru\  
   Mary wants to know to whom John introduced Susan

d. PF: [Sake to biiru]-o\_i \[John ka Bill]-ga \( t_i \)  
   sake and beer-ACC John or Bill-NOM \  
   nonda (rashii) drank seem  
   LF: \[John ka Bill]-ga [Sake to biiru]-o nonda \( \text{rashii} \)  
   (It seems that) John or Bill drank sake and beer  
   ([John ka Bill] > [sake to biiru])

Crucially for the arguments Ueyama makes, there are occurrences of DLs which can only be analyzed as occurring in a Surface OS construction: DLs which have been dislocated long distance, all but at most one DL in a multiple DL construction, and dative DLs in a certain class of perceptual reports. In these constructions, a DL
precedes the subject at PF but is unambiguously c-commanded by the subject at LF. The existence of these constructions allows her to determine which anaphoric relations are sensitive to PF precedence and which depend on LF c-command.

3. Anaphora

3.1 BVA readings

Having determined the possible LF and PF structures associated with different types of scrambled (and non-scrambled) sentences, Ueyama turns to examining the sensitivity of anaphoric relations to these structures. In addition to PF precedence and LF c-command, she shows that the possibility of obtaining a BVA reading for an anaphoric expression also depends on the following two factors:

(3)

Type of QP antecedent

A-type
NP-sae ‘even NP’
55%-no NP
10-izyoo-no NP
kanarinokazu-no NP
NP1 to NP2
NP1 ka NP2

B-type
do-no NP
do-no NP-mo
(subete-no NP

(4)

Nature of the anaphoric expression

large NPs:
so-no-zidoosya-gaisya
so-no daigabu-insei
so-no NP

small NPs:
so-ko
so-re
(so-itu

Though she does not give an account of what it is that distinguishes the two classes of expressions in (3), it is almost certain to relate to Pesetsky’s (1987) notion of D-linking, and hence Ueyama’s observations should help to shed light on the nature of D-linking. Regarding the distinction in (4), Ueyama claims that certain anaphoric
processed involve a process akin to deletion of the anaphoric expression. She thus derives the different behaviors of large NPs and small NPs from constraints on recoverability of deletion. large NPs typically have more informational content, and hence are harder to delete. (See section 4 below for details.)

Ueyama sets out an exhaustive paradigm of examples with different combinations of QP types, anaphoric expressions and LF and PF structural relations to test the relevance of PF precedence and LF c-command for different QP-anaphoric expression pairs. To illustrate the kind of reasoning her assumptions lead to, consider the following example.

(5)

a. ??[So-no zidoosya-gaisy-a-no ko-gaisya]-o that-GEN automobile-company-GEN child-company-ACC
dono zidoosya-gaisy-a ga suisensita no? which automobile-company-NOM recommended COMP
Which automobile company recommended that automobile company's subsidiary?

b. dono zidoosya-gaisy-a ga so-no zidoosya- which automobile-company-NOM that-GEN automobile-gaisy-a-no ko-gaisya-o suisensita no? company-GEN child-company-ACC recommended COMP
Which automobile company recommended that automobile company's subsidiary?

(5a) is potentially either a Deep-OS construction or a Surface-OS construction. On the former assumption, the large NP anaphoric expression precedes its B-type QP antecedent at PF and fails to be c-commanded by it at LF prior to QR. On the latter assumption, the PF precedence relations remain the same, but the dislocated object occurs in the VP-internal object position and is hence c-commanded by the subject. Since the example is unacceptable, it follows that LF c-command is not sufficient for establishing an anaphoric connection between a B-type QP and a large NP. (5b) differs from the Surface-OS version of (5a) only in having the subject and object reversed at PF. This reversal has a direct effect on the acceptability of the anaphoric relation, indicating that PF precedence of the antecedent is a necessary condition for establishment of an anaphoric relation between a B-type QP and a large NP.

Ueyama's exhaustive examination of such examples leads to the following observations regarding antecedent-anaphoric expression pairings:
(6) constitutes an important empirical generalization that any theory of anaphora will ultimately have to come to grips with.

3.2 Coreference

As first argued for in Reinhart (1983), coreference relations have to be treated as separate from BVA relations. Coreference is possible for expressions like names that cannot be analyzed as variables and hence cannot enter into a BVA relation. In English, other types of NPs can enter into BVA relations with an antecedent, including in particular demonstratives, as in the English translation of (5b). This has led some researchers to conclude that demonstratives can refer by their nature to anything salient in the environment, including a variable. It is a consequence of Ueyama's observations on Japanese, however, that accounting for the BVA readings of demonstratives in this way is problematic. Japanese distinguishes between two different classes of demonstratives that can be translated into English using *that*: a-words and so-words.

(7)

a. a-re / so-re 'that thing / it'
b. a-itu / so-itu 'that guy / he'
c. a-soko / so-kō 'that institution / it'
d. a-no hito / so-no hito 'that person'

Both sets of words can be used deictically. As seen in (5b) above, so-words can also give rise to BVA readings. A-words, in contrast, never have BVA readings, as suggested by the minimally contrasting (8).

(8)

*dono zidoosya-gai-sya-ga a-no zidoosya-
which automobile-company-NOM that-GEN automobile-
gai-sya-no ko-gai-sya-o suisensita no?
company-GEN child-company-ACC recommended COMP
Which automobile company recommended that
automobile company's subsidiary?
Absence of BVA readings notwithstanding, a-words can according to Ueyama be anaphoric. Her use of the word "anaphora" in this context, however, is somewhat confusing. A-words, she claims, are independently fully interpretable, and hence by the description of anaphora given at the outset of this review would be non-anaphoric by definition. Thus Ueyama appears to have a distinct idea of what counts as anaphora. Judging by the examples she takes to exhibit anaphora, all cases of coreference -- intended as well as accidental -- are included for her under the heading of anaphora. She thus appears to consider the following two cases to both exhibit anaphoric coreference.

\[
\begin{align*}
a. \quad \text{[Kyonen a-soko-ga kaikosita hito]-ga} & \quad \text{Kyozin-o uttaeta rasii} \\
& \quad \text{Giants-ACC sued they:say} \\
& \quad \text{They say that a person whom it fired last year has sued the Giants.}
\end{align*}
\]

\[
\begin{align*}
b. \quad \text{[Kyozin-no oonaa]-ga a-soko-no datuzei-} & \quad \text{Giants-GEN owner-NOM that-place-GEN tax:evasion-} \\
& \quad \text{mondai-o kabunusi-sookai-de toriageta} & \quad \text{issue-ACC stockholder-general:meeting-at took:up} \\
& \quad \text{The owner of the Giants took up its tax evasion issue at the general meeting of stockholders.}
\end{align*}
\]

What makes this confusing is the fact that (9a), but not (9b), appears to require a deictic use of a-soko in order for coreference to obtain. In the absence of a non-linguistic act of deixis, a relation of coreference cannot be established between a-soko and Kyozin in (9a). In (9b), in contrast, the fact that Kyozin precedes a-soko intuitively makes it unnecessary to give a-soko an independent deictic interpretation in the same way. One is tempted to describe the difference here as one between anaphoric coreference in (9b) and non-anaphoric coreference in (9a). By lumping both examples together as instances of anaphoric coreference, Ueyama seems to be suggesting that the difference is not one that is in need of explanation. As will be seen below, the distinction can be described within Ueyama's analysis, though there are no mechanisms in place which can be used to predict the distribution of the second type of interpretation. This is an important oversight in an otherwise thorough and well-constructed paradigm.

4. Theory
The framework that Ueyama assumes is an extension of Chomsky’s (1995) Minimalist framework. The departures from this framework are few in number but significant. The first major departure is that Ueyama posits a level of Semantic Representation (SR) which sits between Logical Form (LF) and truth conditions. Interpreting LFs thus requires first mapping LFs onto syntactically structured SRs and then mapping SRs to truth conditions. The second major departure is that in addition to expressions introduced into the numeration, Ueyama additionally posits two distinct syntactic relations: Formal Dependency (FD) and Indexical Dependency (ID). Each she claims is a relation which arises within the syntax, and stands in addition to any indexical relations holding among expressions. These relations play a significant role in her analysis since it is these which make it possible to constrain anaphora syntactically.

Related to her two types of dependency, Ueyama posits two distinct types of indices: D-indices and I-indices. D-indices are introduced in the numeration in the same way that case features are. In the mapping from LF to SR, a D-index determines the individual referred to much in the same way that indices determine individuals in Fiengo and May (1994), i.e. via a function σD mapping indexical values (at LF) to individuals (at SR). D-indexed expressions bearing the same index will necessarily refer to the same individual. D-indexed expressions bearing distinct indices \( m \) and \( n \) will only corefer if \( \sigma^D(m) \) happens to equal \( \sigma^D(n) \). While co-D-indexing is represented in the syntax, it is not taken to constitute an independent syntactic relation, and hence there are no syntactic constraints on co-D-indexing. The “anaphoric” relations in (9a,b) are presumably both represented as co-D-indexing. Note that distinguishing (9a) from (9b) by treating only the latter as involving co-D-indexing would make it possible in principle to describe the difference felt to exist between these examples, though this will require Ueyama to address the question of how co-D-indexing can be prevented from obtaining. Within her analysis, this would presumably require treating co-D-indexing as an additional syntactic relation, which goes against her view that D-indices and hence co-D-indexing are determined exclusively in the numeration.

I-indices are employed by Ueyama for two distinct functions: relating traces left by QR to a QP, and relating pronominal NPs to an antecedent. The former relation is established in a manner parallel to Heim and Kratzer’s (1998) mechanism of QR, in that an indexed QP
is taken to raise at LF leaving behind an indexed trace and a bare occurrence of the index adjoined to the scope of the QP. The QP itself surfaces without an index at LF. The trace left behind by QR is interpreted as a bound variable \(v_{bn}\), and the bare index adjoined to the scope of the QP lambda abstracts over this variable, turning it into a predicate at SR. The latter relation -- that of discourse anaphora -- results from mapping I-indexed NPs at LF to free variables \(v_{fn}\) at SR, and placing restrictions on the subsequent interpretation of free variables. These restrictions are modeled on Evans' (1977, 1980) analysis of E-type pronouns, in which an E-type pronoun is understood to refer to the individual(s) that verify the antecedent quantifier-containing clause. Ueyama's rendition of this constraint removes reference to an antecedent quantifier. For her, a free variable \(v_{fn}\) refers to the individual(s) that verify the largest expression of type \(t\) (Ueyama's type \(k\)) containing an occurrence of \(v_{bn}\) (a bound variable with the same index as \(v_{fn}\)) but not containing \(v_{fn}\).

Ueyama uses co-I-indexing to account for donkey anaphora, dependence on indefinites across sentences, and a sub-class of BVA interpretations. The first two cases follow directly from her adaptation of Evans' analysis of E-type pronouns. The third, however requires an extension in order to account for the BVA reading of sentences like (10).

(10)
[Daikigyoo-ga so-no daikigyoo-no giant:company-NOM that-GEN giant:company-GEN ko-gaisya-o suisensuru no]-wa yoku aru child-company-ACC recommend COMP-TOP often exist koto da fact COPULA
It's common that a giant company recommends that giant company's subsidiary.

If \textit{daikigyoo} (a giant company) is taken to be the co-I-indexed antecedent of \textit{sono daikigyoo} (that giant company), the unmodified adaptation of Evans' analysis predicts that it will be impossible to assign an interpretation to the free variable \(v_{fn}\) introduced by the anaphoric expression. This is so because there is no expression of type \(t\) which (i) contains an occurrence of \(v_{bn}\) bound by the antecedent \textit{daikigyoo} and (ii) excludes \(v_{fn}\). Hence there is no way of resolving the reference of \(v_{fn}\).
To overcome this problem, Ueyama proposes to allow the restrictive clause of the antecedent indefinite to count as the effective antecedent of $v_{fn}$, that is to allow $v_{fn}$ to refer to the individual(s) who verify the restrictive clause of the indefinite ($= \text{daikigyoo (} v_{bn} \text{)}$). This move is problematic. There is typically more than one individual who verifies the restrictive clause of an indefinite, and so it is predicted that the anaphoric expression in (10), for example, should refer not to a single giant company but rather to the collection of all giant companies. This, however, would give an interpretation to the sentence that is non-existent -- that it's common that a giant company recommends the $x$ such that $x$ is a subsidiary of every giant company. Though the motivation for attempting this extension is clear -- as a large NP, $\text{sono daikigyoo}$ cannot be given a BVA interpretation via FD since this would involve an unrecoverable deletion of $\text{daikigyoo}$, and co-D-indexing never gives a BVA reading -- the details of the extension clearly have to be worked out more.

As mentioned at the outset of this section, in addition to relations of coindexing, Ueyama further posits the existence of the syntactic relations FD and ID. FD is a relation of Formal Dependency which must hold between any referential expression lacking an index and a suitable antecedent. FD affects interpretation directly: if a syntactic expression B is formally dependent on a syntactic expression A (i.e. if FD(A,B)), then in the mapping from LF to SR, B is mapped onto the semantic representation of A. This is equivalent to the common notion of B's inheriting its reference from A. As a syntactic relation, FD is subject to a single constraint: *FD(A,B) if A does not c-command B at LF. Indeed, it is the sensitivity of certain anaphoric relations to LF c-command that prompts Ueyama to include FD in the syntax. The interpretation of an FD relation ignores all semantic content of B, which Ueyama takes to be equivalent to deletion of this content. As a consequence, FD(A,B) is also constrained by recoverability of deletion of the semantic content of B.

ID, in contrast to FD, has no direct effect on semantic interpretation. The sole reason for including ID in the system is to exclude cases of co-I-indexing in which an expression of type $e$ (Ueyama's type $m$) precedes an expression it is co-I-indexed with at PF. ID is taken to be obligatorily established between any I-indexed NP of type $e$ and each co-I-indexed NP that occurs in the same sentence. The only restriction on IP is the following: *ID(A,B) if A does not precede B at PF. This restriction is needed to prevent generating a BVA
interpretation for sentences like (5a) above when analyzed as a Surface-OS construction.

The system that Ueyama has constructed is relatively simple and coherent, and covers a wide range of data. Because she is addressing such a wide range of phenomena together, it is inevitable that certain parts will not work well with others. To take but one example, consider Ueyama's reason why large NPs cannot stand in an FD relation to an antecedent. Since any expression which is anaphoric via an FD relation picks up its interpretation entirely from its antecedent, the interpretation procedure essentially deletes the semantic content of the anaphoric expression itself. If this content is not recoverable, as is assumed to be the case with large NPs, the anaphora is claimed to be unacceptable. Consider now the manner in which a D-indexed NP such as an a-word is interpreted. The interpretation procedure pays attention only to the D-index and ignores the semantic content of the NP. By parity of reasoning with the FD case, it should be impossible to use a large NP as a D-indexed expression, since the semantic content of the NP would be unrecoverably deleted. And yet expressions of the form ano NP (that NP) are quite regularly used as deictic, and hence D-indexed, expressions. One could avoid this conclusion by assuming that the restrictions found in D-indexed NPs are added as annotations on their referents. Indeed, this is just what Ueyama claims for I-indexed NPs. However, in such a case it is unclear why an expression of the form sono NP could not be related to an antecedent of the form ano NP via FD when the NP parts are identical: while interpretation of sono NP would still involve something akin to deletion, what is deleted would have the exact same interpretation as the annotation on its antecedent, and hence the deletion should be recoverable. Problems like these will certainly surface in greater numbers as more people go through Ueyama's dissertation in the detail it deserves, and will no doubt lead to substantive changes to her analysis. Such problems notwithstanding, Ueyama's dissertation stands as an important starting point for constructing a comprehensive theory of anaphora.

5. Conclusion

Ueyama should be lauded for shrugging the prejudice that referential anaphora has to be analyzed as a single uniform process. The analysis that she has produces is clear, coherent, and empirically justified. Though several problems remain to be worked out before her analysis can be accepted as a replacement for current binding theories -- problems both of a technical nature
and of a conceptual nature -- her approach of dividing the study of anaphora along empirical lines and investigating the distinct properties of anaphora in similar but distinct empirical domains promises to push our understanding of anaphora forward. I look forward to the further development of her work.

**Bibliography**


