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1.0 Introduction

Although there remain fundamental disagreements with studies of anaphora, there seems to be nearly unanimous agreement that Pronominalization as a transformational rule is untenable. A number of syntactic problems with Pronominalization have been noted in the previous studies. Among them, Bach (1970) and Bresnan (1970) are two of such papers that most strongly argue against the transformational approach to anaphora. Wasow (1979) presents a new argument against this approach, which has not previously been discussed.¹

In the search for an alternative approach pronominal anaphora, a number of linguists have proposed various kinds of interpretive methods. Fundamentally, they assume that pronouns are generated quite freely in NP position in the underlying structure and assigned interpretations on surface structure by the rules of semantic interpretation. Among the papers published in recent years, Lasnik (1976) and Reinhart (1976) are representative articles worth reading. The former integrates in terms of the notion of "precede and command" the works accumulated in the framework of the interpretive theory, and the latter proposes the insightful but not fully satisfactory notion "c (onstituent) command", which is the converse relation of in construction with proposed by Klima (1964: 299). Reinhart develops several restrictions on anaphora options in terms of a syntactic domain defined by "c-command". In the rest of this chapter, I will briefly introduce the two approaches mentioned above and assess the validity of each.

1.1 The Relation of "Precede and Command"

The restriction on anaphora which was proposed by Langacker (1969), states, roughly, that the pronoun cannot both precede and command its antecedent. That is, no coreference is possible between a pronoun and a full NP. This restriction captures the difference between (1) and (2).
Throughout the discussion, coreference between NP's has been indicated by underlining them.)

(1) *She denied that Rosa met the Shah.
(2) The man who traveled with her denied that Rosa met the Shah.

In (1), the pronoun precedes and commands the full NP (Rosa), hence, coreferentiality is excluded by the restriction cited above. In (2), on the other hand, coreference is permitted, for the pronoun, which precedes the full NP (Rosa), does not command it.

1.2 The Restriction on Anaphora in terms of Precede and Command

The restriction on anaphora presented by Lasnik (1976) is as follows:

(3) If NP₁ precedes and commands NP₂ and NP₂ is not a pronoun, then NP₁ and NP₂ are noncoreferential. definition: A kommands B if the minimal cyclic node dominating A also dominates B.

Restriction (3) correctly predicts the acceptability and unacceptability of the following sentences:

(4) a. *Rosa denied that Rosa has met the Shah.
   b. *She denied that Rosa has met the Shah.
   c. Rosa denied that she has met the Shah.
   d. She denied that she has met the Shah.

Among these sentences, coreference is possible only in (4c) and (4d). Restriction (3) correctly blocks coreference in both (4a) and (4b), since the embedded NP (Rosa) is commanded by the matrix subject and it is not a pronoun in either sentence.

1.3 The Non-relevance of "Precede and Command"

It is pointed out by Lakoff (1968) that there are several counterexamples to the restriction on anaphora in terms of the precede and command relation cited above in (3):

(5) a. Near him, Dan saw a snake.
   b. In her bed, Zelda spent her sweetest hours.
c. For his wife, Ben would give his life.

(6)  
a. We had fire him since McIntosh's weird habit had reached an intolerable stage.
b. Rosa won't like him any nore, with Ben's mother hanging around all the time.
c. People consider him a genius in Ford's home town.

In these sentences, although the pronoun precedes and commands its antecedent, coreference is still possible. Thus, the restriction (3) incorrectly blocks permissible instances of coreference between a pronoun and a full NP.

In the sentence that follow, unlike the cases above, the condition on coreference mentioned in (3) are perfectly satisfied but coreference is not possible.

(7)  
a. *Near Dan, he saw a snake.
b. *In Zelda's bed, she spent her sweetest hours.
c. *For Ben's wife, he would give his life.

Thus, the restriction on anaphora cited in (3), which depends on the notion of "precede and command", cannot correctly capture the facts and should be considered untenable.

1.4 The "C-Command" Domain

Reinhart claims that the syntactic domain which plays an important role in the application of the coreference restriction should be stated in terms of the new notion "constituent command" (henceforth, c-command):

(8)  
C-COMMAND  
Node A c-commands node B if neither A nor B dominates the other and the first branching node which dominates A dominates B (Reinhart (1976: 32))

It must be noted that the difference between the relations of "command" and "c-command" is that the former mentions only cyclic nodes, whereas the relevant nodes in the latter are all branching nodes. Keeping this in mind, let us look at the abstract tree in (9). (Capital letters stand for any node: 'cy' stands for a cyclic node, that is, NP or S):
Node A both commands and c-commands all the other nodes in (9), and this is also true for node C. But node D, which commands node C since it is dominated by CY₁ which also dominates C, does not c-command node C, for the first branching node dominating D, that is, B, does not dominate C. Domain relations defined by (8) for the tree are as follows:

(10) Syntactic domain in terms of c-command
A / B, C, D, CY₂, E, F
B / A, C
C / A, B, D, CY₂, E, F
D / CY₂, E, F
CY₂ / D
E / F
F / E

((10) is to be read: nodes B, C, D, CY₂, E, F are in the domain of node A)

Then Reinhart defines the syntactic domain in terms of c-command as follows:

(11) Syntactic domain in terms of c-command
The domain of a node A consists of A together with all and only the nodes c-commanded by A. (OR: The domain of a node A is the subtree dominated by the first branching node which dominates A.) (Reinhart (1976: 333))

1.5 Coreference Restriction in terms of C-Command

Reinhart claims that the restriction on anaphora in (3) should be replaced by a newly defined restriction which incorporates the notion of
"c-command"

(12) Coreference restriction in terms of c-command
Two NP's cannot be coreferential if one is in the syntactic
domain of the other and is not a pronoun (where the domain
is defined by the c-command relation) (Reinhart (1976:125).\(^2\)

It is important to note that the operation of the coreference restriction is
restricted in cases where one of two given NP's is in the domain of the
other. This means that there are no restrictions on two definite NP's when
one is not in the domain of the other. In other words, coreference of
definite NP's is free, except for the restriction on anaphora in (12). Thus,
this restriction does not operate on the following sentences, since neither
NP in any of the sentences is in the domain of the other.

(13) a. People who know *Nixon* hate *him*.
b. People who know *him* hate *Nixon*.
c. People who know *Nixon* hate *Nixon*.

In the following discussion, let us consider the examples Reinhart uses
to support her claim that limitations on coreference between two NP's
which cannot be captured by the "precede and command" coreference
restriction in (3) can be correctly explained by the restriction defined by
the syntactic domain of "c-command".

(7) a. *Near Dan, he saw a snake.*

This sentence, which has the structure represented in (14), meets the con-
dition in (3). Thus, the "precede and command" version of the restriction
incorrectly permits a coreferential reading.

(14)
Under the c-command definition of domain, NP₃ (Dan) is c-commanded by NP₁ (he), that is, NP₃ is in the domain of NP₁. Thus the coreference restriction in (12) correctly blocks a coreferential reading, for NP₃ is not pronominalized.

Now let us consider a case of the cataphoric use of pronouns:

(5) a. Near him, Dan saw a snake.

(5a) also has the structure represented in (14), but it does not satisfy the conditions in (3). Thus, following the “precede and command” version of the restriction, (5a) is blocked. On the other hand, given the “c-command” definition of domain, NP₁ (Dan) is not in the domain of NP₃ (him), since the first branching node dominating NP₃ is PP, which does not dominate NP₁. Therefore nothing blocks coreference in (5a).

Consider sentence (15):

(15) We had to fire him since McIntosh’s weird habits had reached an intolerable stage.

The structure of this sentence is roughly as follows:

(16)

Since NP₂ precedes and commands NP₃, NP₃ should be a pronoun in so far as coreference would be permitted. Consequently, and contrary to the fact, (15) would be incorrectly blocked as it stands. On the other hand, given the “c-command” definition of domain, NP₂ does not c-command NP₃, since it is immediately dominated by VP, which does not dominate NP₃. Hence, NP₃ is not in the domain of NP₂, so the coreference restriction does not apply and coreference is possible, even if NP₃ is a full NP and NP₁ is a pronoun. This means that the cataphoric use of pronouns is
correctly explained by the restriction in terms of the notion “c-command” in (12).

1.6 Counterexamples to Coreference Restriction in terms of “C-Command”

1.6.1 Counterexamples from Syntactic Point of View

Thus far, coreference restriction in (12) can account for the examples which are counterexamples to Lasnik’s noncoreference restriction in (3). Reinhart, however, does not take into consideration either the perceptual strategies of speakers and hearers or the fact that “linear order” is an essential property of language. This failure to consider the relevant properties of human language seems to make her proposals to be too rigid. Consider the following examples:

(16)  
   a. *I talked to him about John.  
   b. *Mary always talks to him about Bill’s apartment.  
   c. *I spoke to him in Ben’s office.  
   d. *It didn’t occur to her that Rosa has failed the exam.

The simplified structure of these sentences (except (16d)) can be represented in (16)’:

(16)’

Since NP₁ does not c-command NP₂ in the cases above, NP₂ is not in the domain of NP₁. Thus, Reinhart’s restriction in (12) incorrectly predicts that coreference between pronouns and full NP’s should be possible. But this is not the case. Since the definition of “c-command” crucially depends
on the notion "first branching node", it is inevitable that her restriction will systematically fail to rule out unacceptable cases which have pronominal indirect objects followed by their nominal counterparts, for the domain of indirect objects consists of the PP alone.

Several ad hoc proposals have been suggested to solve this problem. Let us review a few of them.

Reinhart argues that indirect objects should be distinguished syntactically from such PP’s as locatives and instrumentals. That is, an indirect object might be dominated by an NP with an indirect-object case marker, e.g., \([\text{NP to him}] \) in (16 a, b, c), rather than by a PP, e.g., \([\text{PP to}] \) \([\text{NP him}] \). Although this solution solves the problems presented by the cases cited above, it still fails to account for the low acceptability of the following examples, as Reinhart herself admits. (Reinhart (1976: 157))

\[
\text{(17) a. ??We talked with her about Rosa’s son.}
\]
\[
\text{b. ?We talked about her with Rosa’s son.}
\]

Since pronouns in these sentences are not normally considered indirect objects, it is impossible to analyze the prepositions preceding the pronouns as indirect-object markers.

More crucial evidence, which Reinhart mentions in the footnotes against this solution, is the fact that the indirect-object marker to can be left behind when the indirect object is topicalized. (Reinhart (1976: 165))

\[
\text{(18) a. To Bill, Rosa gave a book.}
\]
\[
\text{b. Bill, Rosa gave a book to.}
\]

In (18b), were such a case marker introduced, how could we interpret Bill as an indirect object without a case marker to?

A second proposal, tentatively suggested and refuted by Culicover (1976), is to analyze [talk to] as a verb rather than [verb + preposition] in (16a) and (16b). That is, the preposition is governed by the verb. Following this proposal, Reinhart’s restriction can block coreference between full NP’s and pronouns in (16a) and (16b), for the full NP’s are in the domain of pronouns. As Culicover admits, however, this proposal is also ad hoc, just like the first one. Because there appear to be cases of noncoreferentiality with the structures of the form \([\ldots \text{verb + prep. + NP} + \text{pron.}] \ldots \text{NP} \ldots \) where the preposition cannot be reasonably argued to
governed by the verb, as is the case with talk to...about. So, for example, we have: (Culicover (1976: 113))

(19) *We told the man behind him about Hubert.
(20) *We gave a picture of him to Hubert.
(21) *I talked very seriously to him about John.

Considering all the sentences in (16)-(21), it is quite reasonable to claim that Reinhart's restriction, because of its crucial dependence on the structural notion "first branching node", cannot account for all the unacceptable cases which have the structure \[ S \cdots [PP [P P] [NP + pron.]] \cdots [NP \cdots pron.]]\].

In addition to the structure above, as a theoretical consequence, her restriction cannot explain not only the structures above, but also all the unacceptable or questionable sentences with the structure \[ S [NP \cdots [NP NP] [PP [P P] [NP + pron.]] \cdots [NP \cdots pron.]]\].

Typical sentences containing this construction are those containing "picture nouns" first pointed out by Warshawsky (1965):

(22) *A story about him upset John.
(23) *A painting of him surprised George.
(24) *This picture of her will remind Pamela of her good old days.

Since the pronouns in (22)-(24) do not c-command their antecedents, coreference between the full NP's and the pronouns should be possible under Reinhart's restriction. Contrary to what is predicted by her restriction, the sentences in (22)-(24) are unacceptable or questionable.

Now let us consider conjoined structures. Throughout her paper, Reinhart elaborately excludes conjoined structures from her theory.

(25) *He drank a cup of coffee and John set to repair the TV set.
(26) *He picked up the magazine and George walked out of the room.
(27) *She wrote a letter to Jack every other day, but Mary did not receive a letter from him.

Reinhart's restriction in (12) incorrectly predicts that the sentences in (25)-(27) are perfectly acceptable, because in each case none of NP's in
question are in each other’s syntactic domain, and thus coreference between a pronoun and a full NP must be free. The deficiency of Reinhart’s restriction in the cases of conjoined constructions is solely due to the rigorous exclusion of the linear order (“precede”) from her theory. It is obvious that such structures cannot be explained without the “precede” relation.⁵

1.6.2 Counterexamples from Semantic Point of View

Let us consider examples where the possibilities of coreference vary with the length of the sentence: (Lakoff (1968), Akmajian and Jackendoff (1970) and Wasow (1972))

(28)  a. *In John’s apartment, he smokes pot.  
      b. In John’s apartment near the railroad tracks in the  
         Pamrado district of Bayonne N. J., he smokes pot.

(29)  a. *In Zelda’s bed, she spent her sweetest hours.  
      b. In the bed which Zelda stole from the Salvation Army,  
         she spent her sweetest hours.

Reinhart’s restriction can correctly account for the unacceptability of the (a)-sentences in (28)-(29), for the full NP’s are in the c-command domain of the pronouns, and hence must be pronouns in order to be coreferential with the pronouns. In the (b)-sentences in (28)-(29), on the other hand, coreference is possible, although the structure of these sentences is basically the same as those underlying the (a)-sentences. Thus, Reinhart’s restriction cannot account for these cases.⁵

If we inquire the PP’s more closely, we find that the PP’s in the (a)-sentences are obviously VP-PP’s (“place specifying nonthematic adverbs” in Kuno’s term (Kuno 1979: 125), while the PP’s in the (b)-sentences seem to switch categories, going from VP-PP’s to Sentential PP’s (“scene-setting thematic adverbs” in Kuno’s term). The reason this category switch occurs in the cases cited may be that the increase of information in the VP-PP’s about the places in question makes them lose their original function as place specifiers and assume the new role as scene-setters which is typical to S-PP’s. For further discussion on VP-PP’s and S-PP’s, confer Kato (1980). Reinhart’s restriction, which depends exclusively on the structural relation, cannot account for these cases, where semantic factors
such as the increase of information, to be involved. Reinhart finally confesses in her dissertation:

I will leave open for further study the question whether inside the VP, linear order may play (exceptionally) a role in determining anaphora option. (Reinhart 1976: 158)

The following examples reveal the fact that any theory which depends solely upon the structural property of a language fails to illuminate the nature of the language.

(30) a. John telephoned Bill because he wanted some information.
(30) b. *John telephoned Bill because he wanted some information.
(31) a. John admired Bill because he donated $1000 to UNISEF.
(31) b. *John admired Bill because he donated $1000 to UNISEF.

Reinhart's formal restriction incorrectly predicts that Bill and he in (30b) can be coreferential because Bill nor he are not in each other's domain. But this is not the case. As for (31b), since he is in the domain of John and is a pronoun, John and he can be coreferential as the restriction in (12) predicts. But (31b) is not acceptable.

Caramazza et al (1977) reports that a property of verbs, implicit causality in their terms, is an important factor in determining coreference of potentially ambiguous pronouns. These examples show that any theory of anaphora cannot be perfect without consideration to the lexical property of verbs.

1.7 Conclusion

Thus far, I believe, I have presented enough counterexamples, from the point of view of syntax and semantics, against Reinhart's rigorously formal restriction to indicate its deficiency. The inability of the restriction to account for all the cases cited above seems to be partly due to a theoretical defect, namely, the exclusively formal nature of her approach. In other words, her restriction depends solely upon the structure of sentences, and neglects perceptual strategies, such as the requirement that antecedents and anaphors appear in that order on the level of perceptual processing, and also neglects the lexical property of verbs.

All the preceding examples, which include sentences of various struc-
tural types, suggest that problems of anaphora are not easily resolved on the basis of purely syntactic restrictions.

Footnotes

1. Wasow proposes the following generalization which he claims to hold in English: (Wasow (1979: 207))

The set of environments in which full noun phrases may appear is a proper subset of the set of environments in which pronouns may appear.

This means that "any position which allows a full NP will also allow same pronouns, but not conversely". (ibid)

Wasow argues that if the Pronominalization Theory would correct, it could predict that the inclusion relation should be the opposite, namely, all the positions where pronouns can appear should be the positions where full NP's can appear. The following sentences show that this is not the case:

(i) a. John left, didn't \{he \{the man\}\}?
   b. Mary lost \{her \{Sue's\}\} temper.
   (i) c. I know a person \{whose \{the person's\}\} mother is 106 years old.

As a result, Wasow concludes that the Pronominalization Theory is untenable.

2. Reinhart revises her restriction in chapter four as follows:

Node A c(onstituent)-commands node B if the first branching node dominating A either dominates B or is immediately dominated by a node which dominates B, and is of the same category type as. (Reinhart (1976: 148))

Since this modification seems not to affect the discussion in this present thesis, hereafter I refer to the original definition of the restriction in (12).

3. A "picture noun" is a kind of noun which can appear in the position of NP₁ in the structure, NP₁ —of/about—NP, for example:

(i) John read a book about himself.
(ii) John heard a description of himself.
(iii) John gave Mary a picture of himself.
Warshawsky (1965) formulates the conditions under which Reflexivization applies in terms of the analysis of the picture noun construction.

4. Dialectal variations were observed with respect to the acceptability of these sentences, that is, for some speaker, (23) and (24) were judged acceptable.

5. If Reinhart implicitly assumes that rules which explain various structural phenomena in coordinate constructions, including the cases in (28)-(29), belong to Discourse Grammar in the sense of Williams (1977), she will be sure to overlook the fact that reductions in coordinate constructions, such as conjunction reduction, VP-deletion, Gapping, are a major point of departure for the study of Sentence Grammar.

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