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CONSTRANTS ON REFLEXIVE ANAPHORA: WHERE SYNTAX AND SEMANTICS MEET*

1 Introduction

The present article is a study of two interacting systems of constraints on reflexive anaphora in English. I shall demonstrate that taken alone, neither syntactic approaches such as the Chomskyan binding theory nor semantic approaches based on thematic hierarchies are up to the task of providing a fully adequate description of the distribution of reflexives in English. Rather I propose that both are necessary and investigate the interface between the two.

I maintain (Todoroki 1993) that the grammar of English employs a variety of different sorts of mechanisms to constrain the use of reflexives. Several useful techniques have already been developed in the linguistic literature. The syntactic approach embodied in the Chomskyan binding theory is of course quite well known. Also, researchers like Jackendoff (1972, 1990) and Wilkins (1988) have employed the theory of thematic roles to formulate valuable semantic constraints on anaphor use. From the functionalist perspective, Kuno (1987) has devised yet another insightful approach, mirrored in the work of Hintikka and Sandu (1991). I am of the opinion that all of these may be profitably combined into one grammatical description.

Each of the above-mentioned distinct lines of research is oriented toward its own set of core phenomena, which determine the character of the approach. From that core of basic data, for which each theory is most finely tuned, researchers take pains to expand their approach's empirical coverage, with the goal of producing a fully general theory of anaphora. In principle, taking one of these conceptions of constraints on anaphora and expanding it in as unadulterated a form as possible until it can handle all of the observable data would yield an optimally elegant result. However, I am of the opinion that such a goal is unattainable. Each of the various approaches is useful for handling that part of the phenomenon for which it was originally developed, and we are ultimately better off not attempting to over-extend their application.

Given my view that the grammar employs syntactic, semantic, and functional

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subsystems of constraints simultaneously, it becomes imperative to investigate the interaction of the various subsystems, to determine which is responsible for each of the various observable regularities in the data, and to discover which subsystem takes precedence, when competing subsystems of constraints come into conflict. Such an investigation is the goal of this paper, though the focus of my attention shall be on the interaction of only syntactic and semantic constraints. As for functional issues, I have reported on the initial results of my ongoing research elsewhere (Todoroki 1994).

Initially this discussion will concentrate on a consideration of representative syntactic and semantic approaches to constraints on reflexives. Section 2 deals with the Chomskyan binding theory, and the focus of section 3 is on the thematic-role-based approach elaborated by Wilkins (1988). The goal will be to examine these theories in isolation, thereby identifying those aspects of reflexive usage for which each is particularly well adapted, in addition to exposing those areas that each approach finds problematic. With this comparison completed, the discussion will turn in section 4 to a synthesis of the two preceding approaches. I will offer an original constraint, which makes explicit how syntactic and semantic considerations are to be interwoven in a unified account of the distribution of reflexives. Section 5 summarizes the proposals of this paper.

2 The Syntactic Approach

The most often discussed syntactic analysis of the distribution of pronoun forms is surely the Chomskyan binding theory. I shall therefore take that as a representative syntactic approach. A close examination reveals a number of important strengths along with significant weaknesses that fall into a succinctly describable class, suggesting a non-accidental gap in the coverage of the purely syntactic grammatical mechanisms.

2.1 The Binding Theory

The binding theory is the subtheory of the principles and parameters approach that describes the conditions under which pronoun forms may occur in a sentence. The conditions it comprises are stated in terms of the following categorization of NPs: overt NPs are divided into three groups, ANAPHORS, PRONOMINALS, and R(eferential)-EXPRESSIONS. Anaphors include reflexives—e.g., himself—and reciprocals. The remaining pronoun forms—e.g., he, him, his—constitute pronominals. Finally, non-prouns form the last group, called ‘referential’ expressions, because they do not depend on antecedenthood relations to determine their referents.

1 Although in the binding theory the class of anaphors includes both reflexives and reciprocals, like each other, I assume that they are lexically different and have distinct distributional characteristics, as Wilkins (1988) suggests. Since this paper is intended to concentrate on problems concerning reflexive forms, I will have nothing in particular to say about reciprocals.
The binding theory comprises three conditions, A–C, which I present in simplified form in (1). This definition follows the model set by Chomsky (1986b:166), omitting certain details that need not concern us here:

(1) THE BINDING THEORY
A. Anaphors must be bound in their least complete functional complex (CFC).
B. Pronominals must not be bound in their least CFC.
C. R-expressions must not be bound at all.

These three conditions depend on various subsidiary notions that require explanation. Chomsky (1986b:166) describes the LEAST COMPLETE FUNCTIONAL COMPLEX for an anaphor or pronominal α as roughly a category containing both a subject and a lexical governor of α. In most cases the least CFC turns out to be the first IP (sentence) or NP dominating α. One may think of the least CFC as a LOCAL DOMAIN for a pronoun. The binds relation is defined as follows:

(2) BINDING
α binds β if and only if α c-commands β, and α and β are coindexed.

The relation of binding depends on the further notion of C-COMMAND. One simple definition of this relation is that found in (3), which more or less reflects the usage established by Chomsky (1986a):3

(3) C-COMMAND
α c-commands β if and only if neither one dominates the other, and every branching node that dominates α also dominates β.

Having examined the various definitions that make it up, consider how the binding theory is applied to the following examples:

(4) a. [IP Johni likes himselfi]
   b. [IP Johni believes [IP himselfi to be honest]]
   c. *[IP Johni thinks that [IP Mary likes himselfi]]
   d. *[IP Johni thinks that [IP Mary believes [IP himselfi to be honest]]]

Condition A requires that reflexives be bound in their local domain. In (4a), the least CFC including the reflexive himself and its governor likes is the main sentence. Likewise, the local domain for himself in (4b) is also the main sentence, because the complement IP does not include its governor. In (4c) and (4d), one finds the sentences in (4a) and (4b) embedded as that-clauses. Although himself is bound in all the sentences of (4), (4c) and (4d) are ungrammatical

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2See Chomsky (1986b:169) for the strict definition of CFC.
due to a violation of condition A, since the reflexive is not bound in its local domain. Note that uniformly changing himself into him reverses the grammaticality judgments; this is predicted, since condition A no longer applies, but rather condition B demands that the pronominal not be bound within its least CFC. Finally, condition C requires that r-expressions not be bound; note that John and Mary are never bound within (4), but switching John and himself would violate condition C and bring about across-the-board ungrammaticality.

Moreover, observe the following examples:

(5) a. He hates himself.
    b. *His brother hates himself.
    c. His brother hates John/him.

While in (5a) himself is c-commanded by he, with which it is coindexed, in (5b) the antecedent does not c-command the reflexive, since the former is incorporated into the NP his brother. Therefore, the binding theory predicts correctly that (5b) is ungrammatical. Compare this with (5c) where neither condition B nor condition C is violated.

Let us return for a moment to example (4b); this is an instance of the so-called exceptional case-marking (ECM) structure, which has figured heavily in discussions of reflexives, since Rosenbaum's (1967) seminal analysis. The treatment of reflexives in ECM structures reveals one of the real strengths of the syntactic approach. First recall that a node's least CFC typically turns out to be the minimal IP or NP dominating that node. Now it has been noted (Wilkins 1988) that the notion of 'the minimal dominating IP or NP' could be captured with semantic primitives, based on argument structure. However, the ECM case seen in (4b) provides a crucial exception to the simple-minded 'minimal dominating IP or NP' approach; the anaphor himself is grammatically bound from outside of the minimal dominating IP. However, the definition of the least CFC is so construed as to predict that the anaphor need be bound only within the next higher clause. Now, the mechanisms that allow the definition of CFC to make such crucial distinctions about binding domains are essentially syntactic, viz., the notions of subject and governor. Furthermore, it is hard to imagine how any sensible, semantically-based, alternative definition could achieve the same results as the essentially syntactic least-CFC approach. The justification for this assertion will become more evident in the following section. For now, though, let us simply note that the exceptionally case-marked NP is not a thematic argument of the ECM predicate; thus, the reflexive in (4b) bears no semantic relation to any element in its actual local domain. Simply put, the raw materials needed to construct a semantically-based analysis are lacking. Thus, I think it fair to count the ability to handle ECM constructions like (4b) as one of the notable successes of the syntactic approach to describing constraints on anaphora.

The foregoing enumeration of the predictions of the Chomskyan binding theory suffices as a testament to the strengths of the approach; it correctly models constraints on a wide array of inter- and intra-clausal anaphoric relations, including the crucial ECM cases, which display a distinctly 'syntactic' character.
However, we shall see in the remainder of this section, that there is a succinctly characterizable residue of problematic cases, for which the binding theory is not particularly well adapted.

2.2 Questionable Extensions of the Syntactic Approach

The foregoing description of the Chomskyan binding theory makes it clear that the backbone of the approach is the c-command relation. The natural strengths of this relation lie in reflecting the structural superiority of (a) subjects over VP-internal, clause-mate NPs and (b) superordinate-clause NPs over subordinate-clause elements. However, in the mid-eighties, researchers like Barss and Lasnik (1986) began seriously to take note of problems that arise when the foregoing binding-theoretic analysis is applied to anaphoric relations among clause-mates within the VP.

Given the then-prevalent assumptions about the structures of the double object construction and of PP arguments, the binding theory seemed at odds with various well known empirical generalizations about reflexivization. Such observations led to new proposals about the structure to be found inside of the VP, culminating in the view, advocated most notably by Larson (1988, 1990), whereby what was once considered a predominately flat structure is now recast as a cascade of branching nodes that reflect the c-command relations that the binding theory requires in order to achieve descriptive adequacy. However, I shall argue that the new proposals about VP-internal structure are ultimately unnecessary and indeed untenable.

Returning to my main theme, I wish to suggest that the recent revision of assumptions about VP structure are an unnatural extension of syntactic theory. I shall propose in a subsequent section that anaphoric relations among elements within the VP are more naturally handled by semantic mechanisms based on thematic roles.

2.2.1 The Double-Object Construction. Barss and Lasnik (1986) have noted that double-object constructions like the following are problematic for traditionally assumed VP structures:

\[(6)\]
\[
\begin{align*}
(6a) & \quad \text{I showed John}_i \text{ himself}_i (\text{in the mirror}). \\
(6b) & \quad *\text{I showed himself}_i \text{ John}_i (\text{in the mirror}).
\end{align*}
\]

The grammaticality of (6a) shows that the first post-verbal NP binds the second. On the other hand, the second NP does not bind the first, as shown by the ungrammaticality of (6b). Therefore, the binding theory leads to the prediction that the first NP of the double-object construction c-commands the second one asymmetrically.

The foregoing observations necessitate a discussion of the phrase structure of the VP. Consider the three conventionally assumed double-object VP constructs pictured in (7):

\[\text{...}\]
The flat structure in (7a) represents surely what is historically the most basic assumption about the form of double-object VPs, adopted by Oehrle (1976) among others; the second tree, in (7b), features Kayne’s (1983) binary branching structure; finally (7c) represents a structure made popular in what one might call the post-Montagovian tradition and also adopted by Chomsky (1981). Now, significantly, none of the structures in (7) gives rise to the appropriate asymmetric c-command relation called for in the previous paragraph. The trees in (7a) and (7b) do not yield correct results under the Chomskyan binding theory, since in these structures the hierarchical relation between the two NPs is symmetrical. The structure in (7c) is worse, since the second NP c-commands the first one asymmetrically, contrary to what the data in (6) require.

To overcome the foregoing problem, Larson (1988) proposes a structure along the following lines for (6), in order to make the first NP in the double-object construction c-command the second one asymmetrically:

Indeed, Larson’s structure succeeds in accounting for the contrast in (6) by ensuring the desired asymmetric c-command relation. Note, though, that the structure in (8) arises through transformational movement of the verb. Obviously, such an approach could not qualify as the ‘null hypothesis’ of double-object analyses; it is clearly more complex than, say, the structure in (7a). Thus, according to the methodological principle that one should avoid all unnecessary complexity, given a choice between (7a) and (8), one ought to favor the former, unless there is a demonstrable need to assume the latter. I intend to show in a subsequent section that at least with respect to the anaphora data in (6), there is no need to resort to the derived structure in (8).

Actually, some definitions of c-command, like that offered by Aoun and Sportiche (1981), would hold symmetrically of NP₁ and NP₂ in (7c). However, this difference does not serve to make the structure in (7c) any more compatible with the binding theory.
2.2.2 Inter-PP Reflexive Anaphora. Next let us turn to a type of data which display an apparent binding relation in a syntactic context that seems to disallow c-command; since both the anaphor and antecedent are contained within PPs, let us call this phenomenon INTER-PP REFLEXIVE ANAPHORA:

(9) I talked to Thmugi about himself. (Postal 1971:36, indices mine)

In (9), since Thmugi, the antecedent of the reflexive himself, is seemingly contained in a PP, the former does not c-command the latter.\(^5\) Consequently the binding theory predicts that (9) is ungrammatical, though it is completely acceptable. In the eighties, syntacticians began to concentrate on this problem, and certain proposals were advanced to make inter-PP reflexive anaphora fit the binding theory. However, I intend to demonstrate that these efforts have not been successful.

The most popular concept employed by researchers to explain inter-PP reflexive anaphora is V-P REANALYSIS. Chomsky (1981:225-6), who admits that data like (9) are problematic for the binding theory, suggests the possibility of optionally reanalyzing the V and the P of the to-PP as one V, pruning away the PP node,\(^6\) to make the object of the former to-PP c-command the object of the about-PP. Concerning (9), reanalysis is carried out as follows:

\[
\begin{align*}
(10) \ a. \ & I [vptalked [ppto Thmugi] [PP about himself]] \\
& \Rightarrow \\
\ b. \ & I [vP [v talked to] [NP Thmugi] [PP about himself]]
\end{align*}
\]

In the recent syntactic literature the most widely read proponent of V-P reanalysis is probably Larson (1990). He combines reanalysis with the verb movement approach discussed above; the result is a derivational process that would alter (11a) into (11b):

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\(^5\)Indeed, Thmugi cannot c-command himself, no matter which of the various existing definitions of c-command previously mentioned in footnote 3 one might choose to apply.

\(^6\)It seems to be a general assumption that the PP is indeed pruned. However, let us note, for the sake of completeness, that the reanalysis approach to inter-PP reflexive anaphora does not depend on this pruning, provided that one employs the branching-node definition of c-command assumed here. In other words, leaving an unbranching PP in the tree structure would not alter the c-command relations.
If this type of V-P reanalysis is appropriate, Thmug can indeed come to c-command himself.

At this point we must ask whether the V-P reanalysis approach is really workable. In fact, a close examination reveals certain problems. The first difficulty is pointed out by Chomsky himself, who expresses a certain degree of tentativeness about his own V-P reanalysis approach. He notes the existence of instances of inter-PP reflexive anaphora where V-P reanalysis cannot possibly apply. This problem arises in examples like the following, in which an adverbial separates the V and P which were supposed to have joined together under reanalysis:

(12) I spoke angrily to the men about each other. (Chomsky 1981:226)

In the absence of contiguity between the V and P, reanalysis cannot take place. A similar problem is pointed out by Wescoat (1988):

(13) So many outrageous claims were made about himself by the speaker that the crowd began to heckle. (Wescoat 1988:11)

Note that the antecedent is the by object, which is separated from V by the phrase about himself. Once again the verb and relevant preposition are not contiguous, so reanalysis is not possible. Thus, there are at least two types of well-formed examples which display inter-PP reflexive anaphora and yet are incompatible with V-P reanalysis, due to non-contiguity between the V and the relevant P. Such data are predicted to be impossible by the binding theory and

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Under the standard assumptions of the principles and parameters approach, reflexives and reciprocals are both anaphors and thus should both satisfy condition A of the binding theory. Thus, the men should bind—and consequently c-command—each other. Although I do not accept the implicit claim that reflexives and reciprocals have the same distribution, Chomsky’s observation with regard to (12) is nonetheless relevant to this discussion. To demonstrate this, one need only alter the datum to employ a reflexive:

(i) I spoke angrily to Thmug about himself.

Example (i) is acceptable and thus makes the same point as (12).
thus remain as worrisome counterexamples.

Another form of argument may be leveled against Chomsky and Larson's reanalysis-based approach: whereas earlier I questioned whether the putative V-P reanalysis process could apply in all the cases where the availability of inter-PP reflexive anaphora would seem to require it, I shall now consider the more far-reaching question of whether such a reanalysis mechanism exists at all. Indeed, Postal (1986:204ff) provides five arguments that strongly suggest that the structures which supposedly arise from reanalysis are in fact non-existent. Actually, the focus of Postal's observations is the analysis of PSEUDO- or PREPOSITION-STRANDING PASSIVES:

(14) a. I spoke to Bob.
    b. Bob was spoken to. (Postal 1986:205)

The currently most widely adopted approach to this phenomenon, popularized by Hornstein and Weinberg (1981), employs V-P reanalysis to give a prepositional argument the structural properties of a direct object and thereby make it susceptible to passivization. However, Postal's observations are every bit as damaging to Chomsky and Larson's reanalysis approach to inter-PP reflexive anaphora as they are to the reanalysis-based theory of pseudo-passives. Here I shall restrict my attention to just a portion of Postal's observations.

Postal notes that there are at least two phenomena in English that usually can affect verbs. These are gapping, illustrated in (15), and so-called pseudo-gapping, exemplified in (16):

(15) John wrote the article, and Mary the book.
(16) No one relishes the exhausting labor, but they will the rich rewards.

Here, the verb may be either left out, as in the second conjunct of (15), or else replaced with an auxiliary like does, as in the latter part of (16). As Postal goes on to show, for many English speakers, though not all, these phenomena may not affect verb+preposition sequences. Data illustrating this point for gapping are given in (17) and (18):

(17) a. Frank worked during the Christmas recess and Jackie during the Easter recess.
    b. *Frank worked during the Christmas recess and Jackie the Easter recess.
(18) a. Tony works for Geraldine's sake and Arthur for Gladys's sake.

(Postal 1986:207–8)

Similar observations are offered for pseudo-gapping in (19) and (20):

(19) a. Fred won't write to the president but he will to the vice-president.
    b. *Fred won't write to the president but he will the vice-president.
(20) a. No one fought over the meat but they did over the pie.
   b. *No one fought over the meat but they did the pie. (ibid.:208)

The same speakers who reject the (b) examples in (17)–(20), also report the crucial contrasts in (21) and (22):

(21) a. John talked to Mary (about her sister), and I to Thmug (about himself).
   b. *John talked to Mary (about her sister), and I Thmug (about himself).

(22) a. I couldn’t talk to Mary (about her sister), but I did to Thmug (about himself).
   b. *I couldn’t talk to Mary (about her sister), but I did Thmug (about himself).

These examples suggest that the sequence talk(ed)+to in (21) and (22) behaves in the same way as does any other verb+preposition combination. However, data like the pseudo-passive in (23) and the inter-PP reflexive in (24) depend on V-P reanalysis, in order to receive an explanation:

(23) Thmug hasn’t been talked to by anyone.
(24) I talked to Thmug, about himself. [= (9)]

Now, if talk and to are capable of reanalysis in order to admit (23) and (24)—not to mention (21) and (22) themselves, when the parenthesized material happens to be present—then there ought to be an analysis of (21b) and (22b) in which talk(ed)-to is a single verb that should be susceptible to gapping and pseudo-gapping. Thus, assuming the V-P reanalysis approach leads to an inconsistency between the needs of pseudo-passivization and inter-PP reflexive anaphora on the one hand and gapping and pseudo-gapping on the other. This apparent contradiction raises significant doubt about the whole notion of V-P reanalysis. If, furthermore, V-P reanalysis ceases to be available, then it is questionable whether or not the purely syntactic binding theory can account for inter-PP reflexive anaphora.

2.9 An Assessment of the Syntactic Approach

Despite the considerable success that the binding theory has achieved in some areas of anaphora, the goal of making this a complete theory of the phenomenon remains elusive. Obviously, the binding theory is viable as a fully general approach to constraints on anaphora only so long as it is able to handle VP-internal anaphoric relations correctly. In the present section, I have endeavored to show that this criterion has not been satisfied, despite significant efforts to revise the accepted view of VP-internal phrase structure and to deconstruct PP structures when the need arises. Thus, I am inclined to count the proposals reviewed
above as an unsuccessful extension of the syntactic approach to anaphora. Yet this same empirical domain, VP-internal anaphoric relations, is one of the areas of greatest success in semantically based work on anaphora. It is to this point that I turn in the next section.

3 The Semantic Approach

In the present section I shall review a proposal for a treatment of reflexivization radically different from the syntactic approach set out above. The main thrust of this alternative analysis is that the superiority relation which must hold between an antecedent and a reflexive is predictable from a comparison of their respective semantic argument types.

Among semantically oriented analyses of the conditions on anaphora, the best known are surely those couched in terms of theories of thematic roles, as introduced by Gruber (1965) and refined by such researchers as Jackendoff (1972, 1990) and Wilkins (1988). The notion of superiority necessary for modeling constraints on anaphora is implemented by means of a hierarchy among thematic roles.

Early thematic-hierarchy-based analyses of conditions on anaphora, e.g., that of Jackendoff (1972), were justifiably criticized for inaccuracies in empirical predictions regarding object alternations, such as the one observable with dative verbs like give. However, advances in the theory of thematic roles have corrected various inadequacies in earlier work. As a result, the thematic-role-based approach to conditions on reflexives is now a useful tool for analyzing VP-internal anaphora. However, I shall suggest that attempts to implement a fully general theory of constraints on anaphora using only the tools provided by thematic roles are essentially an over-extension of that method.

3.1 A Modern Thematic-Role Approach

As a representative of thematic-role-based approaches to conditions on anaphora, I will adopt the analysis of Wilkins (1988). However, before considering the problem of anaphora, let us establish certain technical points concerning the way she employs thematic roles. Wilkins advances a rather complex set of definitions and notations as a part of her analysis; however, many of the details of her proposals are not necessary for our present purpose. I consequently provide a somewhat simplified version of her approach that maintains the spirit of the original.

Among the more evolved theories of thematic roles, such as those proposed by Wilkins (1988) and Jackendoff (1990), it is presently assumed that a given argument may bear more than one thematic role with respect to a given role-assigning entity. This view differs notably from that found in the literature, where the $\theta$-criterion is normally construed as requiring that a given role assigner associate thematic roles with arguments one-to-one. However, this does
not mean that one must give up the $\theta$-criterion in order to accommodate the Wilkins approach to thematic roles. Rather, one may view the $\theta$-criterion as requiring that a given role-assigner associate non-empty sets of thematic roles with arguments in a one-to-one manner.

Now let us consider how the ability to assign sets of thematic roles to arguments expands the explanatory capacity of the approach. Originally thematic-role-based theories employed only the now well known roles Agent, Location, Source, Goal, and Theme. However, this view did not provide an adequate tool to analyze various argument-alternating constructions. For instance, consider the sentences in (25):

(25) a. They talked to Mary about Fred.  
b. They talked about Fred to Mary.

While it is surely true that Mary is Goal in both cases, there are nonetheless important differences between the two instances of Mary for which early thematic approaches could provide no account. More recently, additional thematic roles have been introduced to remedy this situation. Wilkins could distinguish the two instances of Mary in (25) by assigning the set \{Goal\} to the Mary in (25b), while the other Mary in (25a) would be assigned the set \{Goal, Affected\}. Similarly, Fred is assigned \{Theme, Affected\} when it is next to the verb, and \{Theme\} otherwise:

(26) a. They talked to Mary$_{(G, Af)}$ about Fred$_{(Th)}$  
b. They talked about Fred$_{(Th, Af)}$ to Mary$_{(G)}$

The role Affected is assigned to arguments which are affected, in some sense relevant to the particular setting, by the action expressed by the verb.

Now let us apply the above thematic analysis to the problem of pseudo-passivization. Recall that in the foregoing discussion of the binding theory, the issue of lexical reanalysis was raised, and I opted to support Postal’s position, i.e., that the notion of reanalysis is not maintainable, either in the case of pseudo-passives or in the case of inter-PP reflexive anaphora. This assumption leaves a void to be filled with regard to the treatment of pseudo-passives. We must provide some analysis of the fact that generally only PPs next to the verb allow their objects to be promoted through pseudo-passivization. Wilkins offers a solution to this problem, based on the observation that usually only arguments next to the verb receive the thematic role Affected. That affectedness is a criterion for passivization is strongly suggested by the following data:

b. John slept in the bed.  
(28) a. *New York was slept in.  
b. The bed was slept in. (Wilkins 1988:210)

---

8Those unfamiliar with the basic semantic notions underlying these thematic roles are directed to the introductory comments provided by Jackendoff (1972:29ff).
As Wilkins states, the bed is affected by sleeping, but New York is not. The observation that for the most part, only arguments with the Affected role may be promoted by passivization combines with the generalization that only arguments next to the verb are affected, to predict that pseudo-passivization can typically affect only PPs contiguous with the verb:

(29) a. Mary was talked to about Fred.  
    b. *Mary was talked about Fred to.  
    c. Mary was talked about to Fred.  
    d. *Mary was talked to Fred about. (ibid.:210)

It is interesting to recall that pseudo-passivization can also occur in cases where the PP whose object is promoted is separated from the verb by an idiom chunk:

(30) John was kept tabs on by the FBI.

Whereas one may wonder about the wisdom of a lexical reanalysis that would incorporate an object, as in kept-tabs-on, it is perfectly natural to assume that the prepositional argument above should receive the Affected role rather than the idiom chunk. Thus, the analysis provided by Wilkins is a plausible substitute for the lexical-reanalysis treatment of pseudo-passivization rejected above, and this fact provides motivation for the thematic approach.

Now let us turn to the treatment of reflexive binding. A theory of anaphora must provide some notion of local domain. Wilkins states the locality condition on reflexives as follows:

(31) **Thematic Locality Condition**
A reflexive anaphor and its antecedent must occur in the same thematic domain. (ibid.:195)

Basically, two arguments are in the same thematic domain if and only if they are assigned $\theta$-roles by the same role-assigning entity.

In addition to a notion of minimal domain, any theory of the distribution of reflexives will require some notion of superiority among potential antecedents and anaphors. In other words, some surrogate for the c-command relation is required. Paraphrasing Wilkins, I provide the relation $\theta$-command in (32), which depends on the thematic hierarchy modeled with the $>_\theta$ relation in (33):

(32) **$\theta$-Command**
$\alpha$ $\theta$-commands $\beta$ if and only if there is some role-assigning entity $\gamma$ such that $\gamma$ assigns the set of roles $\Theta$ to $\alpha$, $\gamma$ assigns the set of roles $\Theta'$ to $\beta$, and there is some role $\theta$ in $\Theta$ such that for every role $\theta'$ in $\Theta'$ $\theta >_\theta \theta'$ holds.
One can use the \( \theta \)-command relation to construct the condition on reflexive binding listed in (34), which I believe retains the spirit of the definition originally offered by Wilkins (1988:211):

\[
(34) \text{THE REFLEXIVE BINDING CONDITION}
\]

A reflexive is coindexed with a \( \theta \)-commanding antecedent.

Notice that it follows as a theorem that any reflexive-antecedent pair that satisfies the condition in (34) will also satisfy the thematic locality condition in (31). Hence, (31) need not be regarded formally as an axiom of the theory.

3.2 Some Strengths of the Thematic-Role Approach

Let us now consider how the foregoing theory affords Wilkins a means of analyzing the conditions on the distribution of reflexive anaphora. The semantic approach can easily handle the inter-PP anaphora that proved difficult for the syntactic binding theory, while also dealing with the double-object construction in a manner that requires no alteration of basic assumptions about phrase structure.

Since the Wilkins approach does not rely on any syntactic configuration like \( c \)-command, it can easily handle (35) and (36), which we have observed are problematic for the binding theory:

\[
(35) \text{I talked to Thmug}_{\{\text{Go,Af}\}} \text{ about himself}_{\{\text{Th}\}}
\]

\[(36) \]

a. *I talked about himself_{\{\text{Th, Af}\}} to Thmug_{\{\text{Go}\}}

b. *I talked to himself_{\{\text{Go, Af}\}} about Thmug_{\{\text{Th}\}}

c. *I talked about Thmug_{\{\text{Th, Af}\}} to himself_{\{\text{Go}\}}

In (35), there is a role-assigning entity \textit{talked} which assigns the set of roles \{Goal, Affected\} (=\( \Theta \) in (32)) to Thmug and \{Theme\} (=\( \Theta' \)) to himself. Now, Thmug will \( \theta \)-command himself, if either Goal or Affected is superior to Theme in the \( \theta \) relation; i.e., either Goal \( \theta \) Theme or Affected \( \theta \) Theme must be true. In fact, both Goal and Affected are superior to Theme, so Thmug \( \theta \)-commands himself, and the reflexive binding condition is satisfied. However, in none of the cases in (36) can the same thing be said. In (36b) the thematic assignments are simply reversed; the antecedent’s single thematic role is inferior to both roles of the reflexive, so the former clearly does not \( \theta \)-command the

\[\text{As a strict partial order, } \theta \text{ is asymmetric—} x \theta y \rightarrow y \not\theta x—\text{and it is also transitive—}(x \theta y \land y \theta z) \rightarrow x \theta z.\]
latter, and the reflexive binding condition is consequently violated. As for the remaining two examples, note that the relation >θ on thematic roles is not a total ordering. In particular, Goal and Affected are not ordered by >θ. Thus, in (36a) the antecedent’s sole thematic role, Goal, is superior to one of the reflexive’s roles, but not the other. While Goal >θ Theme holds, Goal and Affected are unordered, specifically making Goal >θ Affected untrue. Since Goal is not superior to all the roles assigned to the reflexive, Thmugen and himself do not stand in the θ-command relation, and the reflexive binding condition is consequently violated. In the case of (36c), neither of the antecedent’s thematic roles, Theme and Affected, is superior to the single role of the reflexive, Goal; by the same reasoning as employed previously, θ-command is impossible, leaving the reflexive binding condition unsatisfied. Thus, the semantically based constraint set out in (32)–(34) readily predicts the array of data in (35) and (36).

The semantic approach can handle the double-object construction as well. Recall the contrast in (37):

(37) a. I showed Johni himselfi (in the mirror).
   b. *I showed himselfi Johni (in the mirror).

The examples in (37) feature the following thematic assignment:

(38) a. I showed Johni{Pa} himselfi{Go} (in the mirror).
   b. *I showed himselfi{Pa} Johni{Go} (in the mirror).

In (37a), the antecedent’s thematic role, Patient, is superior to the sole role of the reflexive, i.e., Goal. It follows then that the antecedent θ-orders the reflexive, as required by the reflexive binding condition. On the other hand, in (37b) the antecedent’s thematic role is inferior to the role of the reflexive, whence its ungrammaticality. Thus, the semantic analysis can deal with anaphoric relations in the double object construction, and there is no need to revise any basic assumptions about phrase structure.

3.3 Problems with the Semantic Approach

Thus far, we have seen that the semantic approach advanced by Wilkins is highly successful in handling VP-internal anaphoric relations, the very type of data that were previously shown to be most problematic for the purely syntactic analysis, necessitating revisions of standard assumptions about phrase structure. However, if one extends her approach to other anaphoric relations, i.e., relations between subjects and the other elements, problematic cases will arise, and it is to these that I devote the remaining part of this section.

---

10 A relation R is a total order, if and only if R is asymmetric, transitive, and connected—\( x \neq y \rightarrow (x R y \lor y R x) \). As a strict partial order, >θ is asymmetric and transitive; however, it is not connected, since the roles Affected, Location, Source, and Goal are left unordered with respect to each other by >θ.
First, Wilkins’s analysis has a problem with ECM structures like (39):

\[(39) \text{[IP John$_i$ believes [IP himself$_i$ to be honest]]} \quad [=\text{(4b)}]\]

Most researchers assume that himself in (39) is not a thematic argument of the matrix verb believes. In other words, believes does not assign a set of thematic roles to himself. If one reconsiders the definition in (32), it will become clear that for himself to stand in the $\theta$-command relation with John in (39), there must be a role-assigning entity that assigns sets of thematic roles to both NPs. Now, believes assigns a set of thematic roles to John, but not to himself; furthermore, be honest assigns a set of roles to himself, but not to John. Thus, neither predicate in (39) assigns to both NPs, so John cannot $\theta$-command himself. Consequently the reflexive binding condition is violated, and Wilkins’s analysis fails to predict the acceptability of data like (39).12

Another problem arises in connection with by-marked agents in passive sentences. By phrases often, though not invariably, express an Agent, which is the maximal element in the $>_{\theta}$ ordering defined in (33). Consequently, one would predict that passive sentences with anaphors in the by phrase are ungrammatical, as noted by Jackendoff (1972):

\[(40) *\text{John$_i$ was shaved by himself$_i$} \quad (\text{Jackendoff 1972:148})\]

The treatment of (40) in terms of thematic role assignment could be schematized as in (41), leaving several non-crucial details open:

\[(41) \text{John$_\Theta$ was shaved by himself$_\{\ldots, Ag, \ldots\}$}.\]

Now, for John to $\theta$-command himself, there would have to be some $\theta$ in $\Theta$ for which $\theta >_{\theta}$ Agent obtains. However, since Agent is $>_{\theta}$-maximal, no such $\theta$ could possibly exist. Therefore, the present approach predicts that (40) is ill-formed, due to a violation of the reflexive binding condition, and according to Jackendoff’s reckoning, this constitutes evidence of the correctness of the thematic role based analysis of constraints on reflexivization.

However, other researchers, like Pollard and Sag (1994) have noted that slight variations on passives like (40) turn out to be perfectly acceptable, despite the supposedly infelicitous presence of an anaphor in the by phrase.

\[(42) \text{The only barber who was shaved by himself was Figaro.} \quad (\text{Pollard & Sag 1994:276})\]

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11 Notice that failing to assign a set of thematic roles to an NP is not the same thing as assigning it the empty set, $\emptyset$. These two notions are formally distinct and would entail hugely different results with respect to $\theta$-command.

12 Reinhart and Reuland (1993) employ the notion of syntactic arguments of a verb, which are defined as projections to which the verb assigns thematic roles or Case. This allows them to handle ECM structures. Essentially, this is a combination of syntactic and semantic relations, and from this perspective, somewhat resembles the proposals to be offered in the present study.
Additionally, this supposedly illicit anaphor use is observable in actual spoken and written usage, as the following unelicited data show:

(43) Some alleged teenage vandals in Texas are caught in the act—by themselves!\(^{13}\) (Headline News, CNN, March 31, 1994)

(44) ..., when the fish jumped, the man had leaned back on the rod and it was then that the fish had toppled back into the water not guided in its reentry by itself.

These examples show that the thematic explanation of the unacceptability of (40) must be rejected, since it would incorrectly entail the prediction that (42)–(44) are also infelicitous. Consequently, whereas Jackendoff expressed the opinion that the thematic approach correctly handles sentences involving anaphora in agentive *by* phrases, the facts as they are presently known lead to the opposite conclusion. Clearly passive subjects can at times antecede *by*-phrase anaphora, and this stands as a violation of the reflexive binding condition.

Finally, another potential problem for the Wilkins approach comes from nearly synonymous predicates with symmetric argument distributions, yielding such paraphrase relations as \(x \, \text{likes} \, y \equiv y \, \text{pleases} \, x\). Now consider the distribution of reflexive anaphors in sentences with *like* and *please*:

(45) a. John likes himself
b. John pleases himself

These facts may be problematic, depending on how one assigns sets of thematic roles to the arguments of *like* and *please*. If one takes seriously the notion that \(x \, \text{likes} \, y \equiv y \, \text{pleases} \, x\), one might then propose a thematic analysis for the two verbs in question along the lines schematized in (46):

(46) a. John-like himself
b. John-please himself

Identifying the actual contents of \(\Theta\) and \(\Theta'\) in (46) is immaterial to the present argument; it matters only that the subject of *like* and the object of *please* bear the same set of thematic roles and that the same goes for the object of *like* and the subject of *please*. Suppose that (45a) satisfies the reflexive binding condition. That would mean that John \(\theta\)-commands himself in (45a), and this in turn implies that there is some \(\theta\) in \(\Theta\) such that \(\theta >_\theta \theta'\) holds for all \(\theta'\) in \(\Theta'\). However, if this is so, it then follows that there is no \(\theta'\) in \(\Theta'\) such that \(\theta' >_\theta \theta\) obtains for every \(\theta\) in \(\Theta\). Consequently, himself cannot \(\theta\)-command John in (45a). However, for precisely the same reason, John cannot \(\theta\)-command himself.

\(^{13}\)This sentence was the lead-off to a story about a gang of teenage vandals who video-taped their crimes; when their tapes fell into the hands of the police, it resulted that the vandals had in effect 'caught themselves in the act.' This datum and the one following it were drawn from Michael T. Wescoat's collection of anaphora data observed in the visual and print media.
in (45b). In sum, under any thematic analysis that conforms to the pattern schematized in (46), the two sentences in (45) cannot both satisfy the reflexive binding condition.

It might be objected that the foregoing argument pertains only to an overly restrictive class of thematic analyses, i.e., those where the set of thematic roles assigned to the subject of one verb is also assigned unaltered to the object of the other verb, and vice versa. Indeed, the sort of thematic analysis schematized in (46) may not even seem plausible in a modern thematic-role approach. For instance, the discussion in this section has pointed out at least one case of a paraphrase relation where one argument has the Affected role when it is situated immediately after the verb, but not otherwise. It is therefore useful to demonstrate that the foregoing argument about like and please extends to a broader class of thematic analyses, which actually subsumes the technique of attributing additional thematic roles like Affected to immediate post-verbal arguments such as the object. Let us assume that the set of thematic roles assigned to the object of like is a superset of that assigned to the subject of please, and similarly for the object of please and the subject of like. This state of affairs is schematized in (47):

(47) a. John自己喜欢 himselfe
b. John自己喜欢 himselfe

For this argument it is immaterial whether or not $\Psi$ and $\Omega$ are the same, or for that matter whether or not both are non-empty. Suppose that (45a) satisfies the reflexive binding condition, i.e., John $\theta$-commands himself. This implies that there is a thematic role $\theta$ in $\Theta$ such that $\theta > \theta'$ obtains for every $\theta'$ in $\Theta' \cup \Psi$. Trivially, it must then also be true that $\theta > \theta'$ obtains for every $\theta'$ in $\Theta'$. Next note that if this same $\theta$ is in $\Theta$, it must also be in $\Theta \cup \Omega$. It then follows that there is no $\theta'$ in $\Theta'$ such that $\theta' > \theta$ for every $\theta$ in $\Theta \cup \Omega$. This means that in (45b) John cannot $\theta$-command himself, i.e., the reflexive binding condition is violated. In sum, if (47) is an accurate reflection of the pattern of thematic-role assignment in (45), it is not possible for both sentences to satisfy the reflexive binding condition. In this way one may show that a problem arises for the Wilkins-style semantic approach to anaphora with regard to a significant class of thematic analyses of like and please, which I believe subsumes all of the proposals actually advanced within Wilkins’s analysis for a range of other verbs.

3.4 An Assessment of the Semantic Approach

The thematic-role-based analysis of the distribution of reflexive anaphora proves to be quite useful in providing an account of the VP-internal anaphora data that eluded explanation under the Chomskyan binding theory. However, the foregoing observations about ECM data like (39) clearly indicate that this analysis cannot be extended to produce a fully general account of anaphora. This approach appeals to the semantic status of arguments vis-a-vis a predicate, so no
sensible application of this notion can be expected to handle cases where a reflexive anaphor and its antecedent are not both semantic arguments of the same verb. The foregoing observations regarding anaphors in passive by-phrases, as in (42)–(44), and in conjunction with the verbs like and please, as in (45), give further evidence that the semantic approach to constraining the distribution of anaphors is limited as to what data it can handle successfully. Thus, the Wilkins-style approach outlined here can at best be regarded as a component of a larger analysis that draws upon other grammatical notions to provide a fully general theory of anaphora.

4 A SYNTHESIS OF THE SYNTACTIC AND SEMANTIC APPROACHES

As has been argued in the preceding sections, neither the syntactic nor the semantic approach to anaphora is capable by itself of handling the full range of reflexive data discussed here. Therefore, I propose a synthesis of the two approaches, which I shall outline next. To achieve this end, however, one must pay close attention to the interface between the syntactic and semantic components of the analysis, in order to determine which one takes precedence in a given case. In what follows I shall propose a modified view of the binding relation that handles this interface problem. I shall also speculate on an extension to the binding theory that provides an account of some pronominal data that are closely related to certain examples with anaphors that have been heavily discussed in this study.

4.1 Constraining Reflexives with a Revised View of Binding

Throughout the foregoing discussion of the syntactic and semantic approaches to constraining the distribution of anaphors, attention has been focused on two relations, c- and θ-command, to see which one more accurately reflected the relationship of ‘superiority’ that must obtain between an antecedent and an anaphor. Since neither c- nor θ-command was entirely successful, this section will be devoted to devising a new superiority relation on which to base the notion of binding.

First I note that the notion of superiority employed in the constraints on reflexives should somehow incorporate both the relation of c-command and that of θ-command. In this regard, recall that in ECM data like (48) the antecedent c-commands the infinitival-subject anaphor, but the two NPs do not stand in the θ-command relation:

(48) [IP Johni believes [IP himselfi to be honest]] [=(4b)=(39)]

In contrast, in the following case of inter-PP anaphora, the object of the preposition by clearly cannot c-command the about-object, though as an agent the former θ-commands the latter:
So many outrageous claims were made about himself by the speaker that the crowd began to heckle.

In these cases, anaphoric binding takes place between NPs that stand in one or the other relation but not both, so I assume that the superiority relation to be adopted here should involve some disjunction of c- and θ-command.

Now let us consider instances where both c- and θ-command obtain, in order to understand which takes precedence. Of particular interest are examples involving passive by-phrases:

(50) The only barber who was shaved by himself was Figaro.
(51) Some alleged teenage vandals in Texas are caught in the act—by themselves!
(52) . . ., when the fish jumped, the man had leaned back on the rod and it was then that the fish had toppled back into the water pro not guided in its reentry by itself.

Sentences (50)–(52) show that subjects may antecede by-objects. Now, the former asymmetrically c-command the latter. In stark contrast, however, since agents are >θ-maximal, it follows straightforwardly that the by-objects above θ-command all other arguments in the same thematic domain, including the subject. Consequently, in these instances the relation of c-command is the mirror image of θ-command. Obviously, in cases such as these, c-command takes precedence over θ-command in determining antecedency. Compare (50)–(52) with (49); the by-object does not stand in the c-command relation with the object of the preposition about, and the relation of antecedency in (49) parallels that of θ-command. Thus, it appears that c-command takes priority over θ-command, the latter being relevant when the former relation is absent.

If one now considers the data in (53), it becomes clear that the conclusion just reached is in need of slight modification:

(53) a. I showed John himself (in the mirror).
   b. *I showed himself John (in the mirror).

The data in (53) feature the double-object construction, which I assume involves the simple phrase structure in (54):

(54) VP
    /   /
   V  NP NP

Given (54), the c-command relation clearly holds symmetrically of the two NPs. This leads to the conclusion that if these NPs are coindexed, they will mutually bind each other. Anomalously, with such coindexing, the Chomskyan binding theory would allow only a pair of anaphors to occupy these positions; anything else would lead to a condition B or C violation. As has already been noted
though, the left-hand, Patient NP $\theta$-commands the right-hand, Goal NP. Consequently, the relation of antecedency illustrated in (53) obviously reflects the $\theta$-command relation rather than $c$-command. I suggest that the reason why $\theta$-command takes precedence over $c$-command in this case is that the latter relation holds symmetrically here, whereas the $c$-command observable in (50)-(52) is asymmetric. Thus, asymmetric $c$-command takes priority over $\theta$-command, but when $c$-command is absent or else when it holds symmetrically, $\theta$-command must obtain for the relation of binding to hold.

With these observations in place, I propose a new relation of superiority on which to base the definition of binding. Let us call this relation synthesis-command, or more compactly $\sigma$-command, because it brings together the relations of $c$- and $\theta$-command. Its definition simply reflects the conclusions reached in the foregoing portion of this section:

(55) $\sigma$-COMMAND
\[
\alpha \sigma\text{-commands } \beta \text{ if and only if either } \alpha \text{ asymmetrically } c\text{-commands } \beta, \\
\text{or else } \beta \text{ does not asymmetrically } c\text{-command } \alpha \text{ and } \alpha \theta\text{-commands } \beta.
\]

One may now revise the definition of binding to use $\sigma$- rather than $c$-command:

(56) Revised Definition of Binding [cf., (2)]
\[
\alpha \text{ binds } \beta \text{ if and only if } \alpha \sigma\text{-commands } \beta, \text{ and } \alpha \text{ and } \beta \text{ are coindexed.}
\]

With these definitions, it is possible to use condition A of the binding theory without change in order to predict all of the data discussed so far in this section:

(57) Binding Condition A [= (1A)]
\[
\text{Anaphors must be bound in their least complete functional complex.}
\]

I shall next show that this analysis predicts the remaining challenging data that have been discussed in this study.

First consider the like/please alternation seen in (58):

(58) a. John$_i$ likes himself$_i$ \\
b. John$_i$ pleases himself$_i$ [=(45)]

Clearly the antecedent asymmetrically $c$-commands the anaphor in both cases in (58), since the former is the subject and the latter the object. This is enough to ensure the proper relation of binding. Thus the fact that the $\theta$-command results regarding the pair in (58) were shown to be at best unclear and at worst contradictory does not prevent the present analysis from unambiguously predicting the pattern of binding displayed above.

Let us next take up the array of data in (59):

(59) a. I talked to Thmug$_{(Go, Af)}$ about himself$_{(Th)}$ \\
b. *I talked about himself$_{(Th, Af)}$ to Thmug$_{(Go)}$
c. *I talked to himself\textsubscript{(Go, Af)} about Thmug\textsubscript{(Th)}
d. *I talked about Thmug\textsubscript{(Th, Af)} to himself\textsubscript{(Go)} \[= (35) \& (36) \]

Here both antecedent and anaphor are objects of prepositions and thus do not stand in the c-command relation. The revised approach advocated here maintains that the relation of binding then falls back on θ-command to establish whether the antecedent is superior and therefore licit. As has already been established, only in (59a) does the antecedent Thmug θ-command the anaphor himself. Thus the present analysis straightforwardly predicts the data in (59).

It would appear that the approach outlined above successfully melds the syntactic and semantic theories, retaining from each its most desirable results. I believe this underscores the potential utility of considering the distribution of anaphors as being determined by a combination of factors potentially drawn from different levels of linguistic representation. What is required to harness the explanatory potential of such a heterogeneous theoretical approach is a close consideration of the interface among the different types of constraints, like that embodied in the proposal for σ-command above.

4.2 Speculation on Rounding out the Binding Conditions

Though the present study is devoted primarily to the investigation of the conditions on the distribution of reflexive anaphors, I think it not out of place to speculate briefly on the character of the binding theory as a whole. This is especially true, since the synthesis of syntactic and semantic approaches advocated here makes available new notions that facilitate remedying a known problem with the original Chomskyan binding theory.

Let us consider the remainder of the binding theory not yet reviewed in this section. Recall that conditions B and C of the binding theory take the form of prohibitions against binding. This prohibition is conditional with regard to B, and unconditional with regard to C:

\[(60) \text{BINDING CONDITIONS B AND C} \quad [= (1B,C)] \]

B. Pronominals must not be bound in their least CFC.
C. R-expressions must not be bound at all.

Now, a prohibition on binding need not be a prohibition on coindexing with other NPs; such coindexing is permitted for pronominals and r-expressions, whenever they are not ‘inferior’ to the NPs with which they are coindexed. The notion rendered here as ‘being inferior’ can be interpreted as either ‘being c-commanded’ or as ‘being σ-commanded,’ depending on whether one assumes the original Chomskyan theory or the revision just proposed. This consequence of the binding theory is crucial in the analysis of such data as (61):

\[(61) \]

a. John’s\textsubscript{i} mother loves him\textsubscript{i}
b. His\textsubscript{i} mother loves John\textsubscript{i}
Since the possessor of the subject and the object stand in neither the c- nor the σ-command relation, the two may be legitimately coindexed.

However, the same reasoning erroneously predicts that some or all of the forms in (62) should be acceptable on a reading where Thmug and him are coreferent:

(62) a. *I spoke to Thmugi about himi
    b. *I spoke to himi about Thmugi
    c. *I spoke about Thmugi to himi
    d. *I spoke about himi to Thmugi

If one assumes c-command-based binding, (62a–d) are all predicted to be acceptable; assuming instead σ-command, one would mistakenly admit (62c,d). These predictions are clearly entailed, because the objects of the two PPs cannot stand in the c-command relation, and only in the first two cases does one prepositional object 0-command and therefore σ-command the other.

Now let us set about searching for a solution to the problem just sketched. I will concentrate on (62c,d), which are the most problematic. First let us consider the possibility of maintaining the three binding conditions unchanged, while proposing modifications to the definition of binding. The goal of such a move would be to find a way of predicting the ill-formedness of (62c,d) by constructing a superiority relation that would produce a condition B or C violation. For instance, if the revised superiority relation predicts that the object of about in (62c,d) binds the object of to, then a condition B violation results in (62c), a condition C violation arises in (62d), and both sentences are predicted to be ill-formed. While this would indeed rule out (62c,d), achieving that end in this way leads only to a new problem, because one would then erroneously predict that the to-phrase ought to be able to contain an anaphor. The same reasoning holds mutatis mutandis if one revises the superiority relation to allow the object of to to bind that of about:

(63) a. *I spoke about Thmugi to himi/himselfi
    b. *I spoke about himi/himselfi to Thmugi

Actually the fact that neither pronominals nor anaphors are acceptable in (63) contradicts the logic inherent in the existing binding conditions; the complementary nature of conditions A and B would lead one to expect that either both pronominals or else one of the anaphors ought to be grammatical. Thus, it is futile to attempt to find yet another modification of the superiority relation that underlies binding in order to handle the foregoing facts.

The next logical step is to seek a solution to the above problem through a modification of the conditions of the binding theory. Toward this end, I propose to ask first what distinguishes the cases in (62) from those in (61). One obvious answer to this question is provided by the semantic notions that have been incorporated into the present analysis. The objects of the prepositions about and to in (62) are in the same thematic domain; however, the same cannot be
said of the subject possessor and the object in (61). Taking advantage of this fact, one could propose an addendum to the binding conditions that would take the form seen in D below:

\[(64) \text{THE REVISED BINDING THEORY} \quad \text{[cf., (1)]}\]

A. Anaphors must be bound in their least complete functional complex (CFC).
B. Pronominals must not be bound in their least CFC.
C. R-expressions must not be bound at all.
D. Coindexed elements in the same thematic domain must stand in the binding relation.

This solution would take care of both (61) and (62). First of all, condition D would not affect (61), because the subject possessor and the object are not in the same thematic domain, as has already been mentioned. Hence, the traditional analysis of that case is maintained unchanged. However, since the objects of the prepositions about and to in (62) share a common thematic domain, it follows from condition D that to be coreferent, one must bind the other. This fact, combined with the foregoing observations about σ-command, leads to the conclusion that there is precisely one way in which these prepositional objects may be coreferent, and that is illustrated in (65a):

\[(65) \text{a. I spoke to Thmugi about himself }/\text{him}_i \]
\[ \quad \text{b. I spoke to }\text{him}_i/\text{him}_i \text{ about Thmugi} \]
\[ \quad \text{c. I spoke about Thmugi to }\text{him}_i/\text{him}_i \]
\[ \quad \text{d. I spoke about }\text{him}_i/\text{him}_i \text{ to Thmugi} \]

Since the prepositional objects in (65c,d) do not stand in the σ-command relation and therefore cannot stand in the binding relation either, it is impossible, according to condition D, for NPs in these positions to be coreferent under any conditions. However, the object of to in (65a,b) has already been observed to σ-command the object of about, so the former binds the latter. This fact leads to a condition C violation in (65b), and a condition B violation if the about-phrase in (65a) contains the pronominal him. Only when the about-phrase in (65a) holds an anaphor, which may be locally bound, are all of the binding conditions satisfied.

These comments are intended only to give a glimpse of how one might incorporate my main proposal about constraining the distribution of anaphors into a more general binding theory. Though this topic deserves a great deal more attention, I will leave the matter at this speculative stage for now.

5 CONCLUSION

In the present study, I have examined two theories of anaphora, one syntactic, the other semantic, and shown that neither is sufficient by itself to account for the
distribution of reflexive anaphors in English. However, each has its own domain of empirical coverage where it achieves significant accuracy in its predictions. Furthermore, these domains are to a notable degree complementary; the semantic approach handles VP-internal anaphora more naturally than does the syntactic one, while the latter proves superior elsewhere. I have attempted to harness the complementary strengths of the two analyses by combining their respective superiority relations, c- and θ-command, into a new relation, σ-command that gives priority to asymmetric c-command and falls back on θ-command when the former is absent. Using this relation as the basis of the definition of binding, and proposing a simple augmentation of the binding conditions, I was able to propose a straightforward analysis of all of the data that I had shown to be difficult for one or the other of the purely syntactic or semantic theories previously examined.

I believe that one of the principal merits of the combined approach proposed here is its simplicity. This is perhaps surprising, since one might imagine a priori that a heterogeneous approach would be more complex than one based solely on a purely syntactic or semantic basis. In this case, however, it appears to be the reverse; for instance, one can avoid verb movement and V-P reanalysis by merely adopting the new superiority relation σ-command, which is itself quite simple to define. I would further point out that the implementation of my proposal for a synthetic syntactico-semantic approach is conveniently modularized to interact correctly with other areas of grammar. For instance Barss and Lasnik (1986) and Larson (1988) point out that the same notion of superiority that underlies the constraints on reflexive anaphora is also an important component of the explanations of quantifier-pronoun binding, wh-movement, reciprocal anaphora, and negative polarity. I expect that future research will reveal that σ-command can adequately model the relevant superiority relation in all of these areas. In conclusion, I hope that my observations here demonstrate that a careful investigation of the interface between different levels of linguistic representation can be fertile ground for analyses of difficult phenomena that resist description in traditional, theoretically ‘homogeneous’ approaches.

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