



Missing Antecedents

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Source: *Linguistic Inquiry*, Vol. 2, No. 3 (Summer, 1971), pp. 269-312

Published by: [The MIT Press](#)

Stable URL: <http://www.jstor.org/stable/4177639>

Accessed: 22/04/2013 13:44

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Missing Antecedents

I. Background*

Natural languages typically manifest a phenomenon we shall refer to as *Identity of Sense Anaphora*. This aspect of language is present when some stretch of a Surface Structure, null or not, has its interpretation determined by ‘identity of meaning’ to some other portion of that Surface Structure.¹ The notion is best clarified by example:

- (i) a. Harry insulted his wife and Bill did too.
- b. Max is looking for immortal zebras that can fly but there are no such zebras.
- c. Larry married a nurse who owned an iguana but Pete did not marry one.

In (1a), the second clause is interpreted such that *Bill* is the subject of a Verb Phrase² meaning ‘insulted his wife’. We thus regard (1a) as containing a null *anaphor*³ of the

* We would like to thank G. Lakoff, W. Plath, and J. R. Ross for useful criticisms of the manuscript.

¹ One must thus distinguish the kind of identity involved in Identity of Sense Anaphora from that involved in *coreference*. Observe that in examples like:

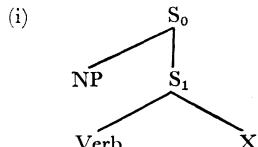
- (i) The caterpillar_i will be able to fly when it_i is a butterfly.

there is a kind of identity between the indexed nominals, a type which has been called *coreference* (better *stipulated coreference*). Notice though that in (i) the identity is not identity of sense. Thus the meaning of (i) is in no way given by:

- (ii) The caterpillar_i will be able to fly when the caterpillar_i is a butterfly.

which has a contradictory final clause. This shows that coreferential nominals do not necessarily share all of the same sense.

² Notice that one can perfectly well talk of constituents called *Verb Phrase* without committing oneself to the existence of any unique node label, VP, or the like. For example, a Verb Phrase might be an S constituent which directly dominates a Verb. Hence in:



S₁ would be a Verb Phrase but S₀ would not be.

³ The happy term *anaphor* as an equivalent of *anaphoric element* is due to Edes (1968).

Identity of Sense type. (1a) is, of course, several ways ambiguous. Thus, on one reading, *his wife* does not refer to Harry's wife but to some other woman, X. In this case, the second clause has only the interpretation 'Bill insulted X'. On another reading, the first clause is interpreted such that Harry insulted his own wife. In this case, there are still two readings for the second clause. On one, it means that 'Bill insulted Harry's wife', on the other that 'Bill insulted his own wife'. These ambiguities are not directly relevant to the present discussion, but bear primarily on the problems of defining correctly the notions of "identity of meaning" relevant for Identity of Sense Anaphora.⁴ In (1b), the Noun Phrase (henceforth *NP*) *no such zebras* is interpreted as meaning 'no immortal zebras that can fly'. We thus regard *such* as an Identity of Sense Anaphor.⁵ In (1c), the noun *one* is interpreted as meaning 'nurse who owned an iguana', and we thus regard *one* as an Identity of Sense Anaphor as well.⁶

It is obvious that a grammar must contain devices for associating Identity of Sense Anaphors (henceforth *I-S=A*) with their interpretations. These devices, regardless of their character, will have to determine these interpretations on the basis of properties of other structure in the relevant Surface⁷ forms, henceforth the *Antecedent (Structure)*. One can distinguish at least two possible approaches to the description of *I-S=A*. One, which has been traditional within transformational studies, would handle such anaphora by means of deletion rules subject to appropriate identity conditions. Hence, in this approach, sentences (1a-c) would be derived from underlying *syntactic* representations of respectively the schematic form:

- (2) a. Harry insulted his wife and Bill insulted {her
 his wife} too.⁸

⁴ The identity conditions for Verb Phrase anaphora and other types are very complicated and poorly understood. Some suggestions involving the notion 'sloppy identity' have been made by Ross (1967, 1969b). Some suggestions involving the notion of 'propositional function' have been made by McCawley (1967). We would add here only that the identity conditions on these processes are of at least two distinct sorts. One class of identity requirements must refer to the Semantic Representations. The other involves superficial syntactic properties. One illustration of the latter type of constraint is given in Section V.E below.

⁵ This is probably a simplification in that the real anaphor in this case is probably null, with *such* being simply an adjective. The construction would have an underlying form:

(i) Max is looking for immortal zebras that can fly but there are no zebras which are such that they are immortal and such that they can fly.

⁶ This is also a simplification in that it can be argued that the constructions with *one* anaphors reduce to *such* anaphor constructions. Cf. Postal (to appear e).

⁷ This is an oversimplification in at least two senses. First of all, for the class of cases discussed here, the Antecedent structure does not in all examples lie in Surface Structure, but frequently in some earlier stage of the Derivation. Secondly, there is a class of examples not discussed in the present study, including such sentences as:

(i) Please do so immediately.
(ii) Johnson didn't want to.

which would traditionally be described as having Antecedent structures in previous sentences of discourses.

⁸ As noted in footnote 4, the identity conditions are far from clearly understood. The pair of examples in (2a) partially illustrate the scope of the problems involved in formulating the semantic identity conditions for Identity of Sense anaphora. Notice that the coreferential NP in the top example, *his wife* and *her*, count as semantically identical, no doubt because they are stipulated coreferents. In the bottom example, the NP *his wife* and *his wife* count as semantically identical although they are *not* coreferential. The question is what general principle will have both of these as consequences. The suggestion involving propositional functions mentioned in

- b. Max is looking for immortal zebras that can fly but there are no immortal zebras that can fly.
- c. Larry married a nurse who owned an iguana but Pete did not marry a nurse who owned an iguana.

Under this form of description, the semantic interpretation of the set of $I - S = A$ is determined by whatever principles determine the semantic interpretations of ordinary nonanaphoric constituents like *no immortal zebras that can fly*, etc. No special devices of a semantic or interpretive nature are required. These are obviated by the existence of transformational rules relating $I - S = A$ to syntactic structures of an independently generated type, this process being governed by identity conditions relating $I - S = A$ to their Antecedent Structures.

There exists logically, however, a quite different approach. One might claim that $I - S = A$ are not to be derived syntactically from 'full' underlying constituents. One might claim instead that $I - S = A$ exist in the deepest syntactic structures in essentially their Surface Structure form⁹ and that there exists a special set of *Interpretive Rules*, distinct in form and function from syntactic (transformational) rules, which operate on $I - S = A$ and the interpretations of their Antecedents to determine the semantic interpretation of the $I - S = A$ constituents. Such an approach seems to have been suggested first in Katz and Postal (1964, 44), where a crude form of such an Interpretive Rule was proposed for examples like:

- (3) John plays chess as well as Sydney.

It was proposed that the null Verb Phrase $I - S = A$ in this case be assigned an interpretation by means of the rule:

- (4) When there is a derived P-Marker of the form (*Noun Phrase₁* + *Verb Phrase₁* + *as* + *well* + *as* + *Noun Phrase₂*), it is to be treated semantically as if it were of the form (*Noun Phrase₁* + *Verb Phrase₁* + *as* + *well* + *as* + *Noun Phrase₂* + *Verb Phrase₁*).

footnote 4 comes closest to making sense out of this. On this view, one can say that the Verb Phrases in both clauses of the top reading of (2a) are substitution instances of the propositional function (fragment) *insult X*, where *X* is a constant designating Harry's wife. On the bottom reading of (2a), the Verb Phrases in both clauses are substitution instances of the propositional function (fragment) *insult y's wife*, where *y* is a variable bound by the subjects of the clauses in each case. This indicates hope for developing the semantic identity condition in terms of a general constraint requiring the deleted portion to correspond to a portion of a propositional function identical to the portion corresponded to by the Antecedent structure. Note that this approach makes the empirical claim, which seems correct in this case, that the NP *his wife* has (partially) different semantic structures in the two readings of (2a), since in one it corresponds to a semantic constant, in the other, to a semantic variable, no matter how this distinction is ultimately to be formalized. For important observations on the latter question cf. Karttunen (1969).

⁹ Thus, for example, the Deep Structure of a Surface string which contained a Verb Phrase VP_i consisting entirely of the elements *do so* would contain a Verb Phrase, VP_j , whose inventory of elements would be *do so*. The interpretation of that *do so* would, on this account, be assigned during the Derivation of the sentence. In the case of the zero anaphor, the Deep Structure would consist of empty or unfilled nodes which are assigned an interpretation by, presumably, the same set of Interpretive Rules.

However, in this work, such rules were proposed only as targets of criticism, and it was explicitly denied that such rules existed in human languages. The idea was then ignored in following work. However, recently there has developed, no doubt independently, an approach to anaphora which involves the essential ideas of rules like (4). Thus various writers at MIT over the last few years have raised the possibility of treating some $I - S = A$ in terms of Interpretive Rules instead of syntactic deletion.¹⁰

Our purpose here is to examine in slightly greater detail the conceptual differences between these two approaches to Identity of Sense Anaphora, and then to present a series of arguments, based largely on sentential properties we shall refer to jointly as *The Missing Antecedent Phenomenon*, which show decisively that the original conclusion (though not the arguments, which are at best irrelevant) of Katz and Postal (1964) is correct. That is, $I - S = A$ must be described in terms of syntactic rules of deletion.

II. The Difference Between the Syntactic-Deletion and Interpretive Views

We shall assume an overall framework of grammar as follows. There is a *Base Component* which generates the deepest syntactic structures, called here *Deep Structures*, and a component containing a sequence of transformational rules which derive sequentially the final syntactic structure, or *Surface Structure*, for each sentence. Such a grammar generates *Derivations*, each of which consists of a sequence of syntactic trees with distinguished initial and final members forming Deep Structure-Surface Structure pairs. Each such pair must be associated with a Semantic Representation. We shall leave open how this is accomplished in general. We are concerned in detail with how it is accomplished in the case of $I - S = A$.

Consider now some Derivation generated by such a grammar, and, in particular, the Surface Structure in this Derivation. Such a Surface Structure will consist of a certain ordered set of constituents. Notice that one can define for each Surface constituent its *corresponding* constituent or set of constituents in each previous structure of the Derivation, including the Deep Structure. These define, as it were, the ancestor structures of the particular constituents of the Surface Structure.

The Syntactic-Deletion and Interpretive approaches to Identity of Sense Anaphora differ crucially in their attribution of corresponding constituents to $I - S = A$, null or otherwise. As already mentioned, under the Syntactic-Deletion approach, each $I - S = A$ will have a corresponding constituent in Deep Structure which is a 'full' constituent, meeting identity conditions to the Antecedent Structure. In this form of analysis, $I - S = A$ are not present in Deep Structures and arise through transformational operations which merge an infinite variety of constituents into $I - S = A$. The key fact then is that a particular $I - S = A$, say *such*, will have an infinite variety

¹⁰ Cf. Akmajian (1969), Chomsky (to appear), Jackendoff (1969).

of possible underlying syntactic ancestors, to which it is related by transformational deletion rules. Schematically:

(5) DEEP STRUCTURE

Mary found a brontosaurus < that was cute > and Joan

found a brontosaurus that was cute

INTERMEDIATE STRUCTURE

Mary found a brontosaurus // that was cute and Joan found a
brontosaurus such too

SURFACE STRUCTURE

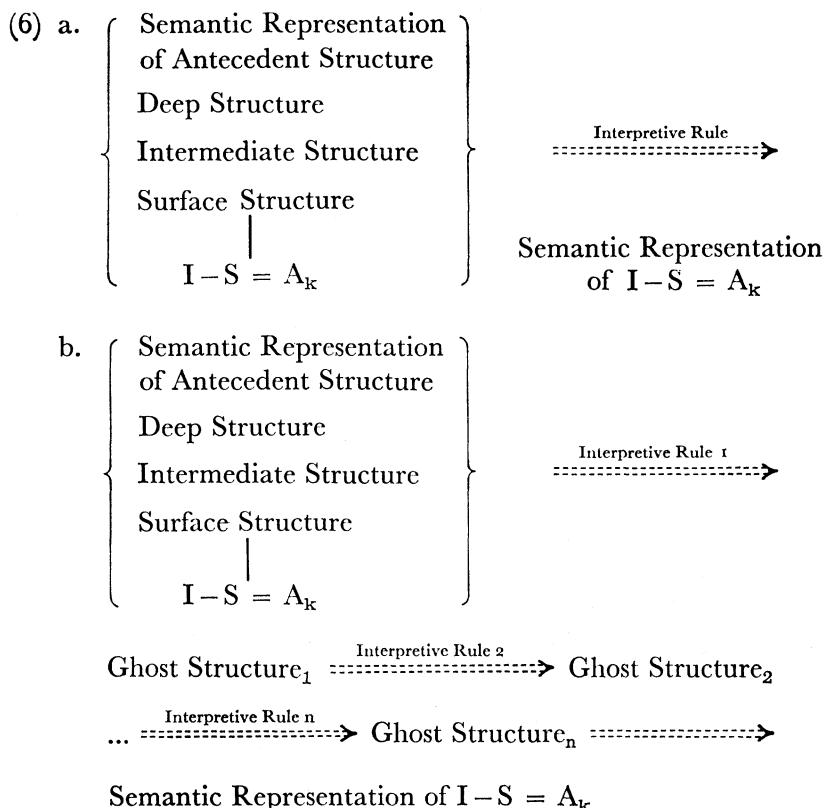
Mary found a brontosaurus that was cute and Joan
found such a brontosaurus too

Hence in such a Derivation, the Surface I – S = A *such* has a corresponding constituent *that was cute* in the Deep Structure. Therefore the interpretation of *such* in (5) is determined by the principles that determine the interpretation of the boxed constituent in Deep Structure, and these are, in turn, the same as those which determine the interpretation of the angled constituent in Deep Structure. Summing up then, in the Syntactic-Deletion Approach, Surface I – S = A like *such* have a syntactic Derivation which provides them with ‘full’ ancestors in underlying syntactic representations, including Deep Structures. Thus the syntactic relation between particular Surface I – S = A and their ancestors in Deep Structures for the whole set of Derivations is *one-many*.

In the Interpretive Theory, however, the situation is very different. Although we are aware of no precise formulation, certain necessary general features are clear, and we shall restrict ourselves to these. First, in this approach, the I – S = A themselves, or some arbitrary elements of which they are direct reflections, are present in the deepest syntactic structures, that is, they are generated directly by the Base Component. Hence in this view, the relation between particular Surface I – S = A and their corresponding constituents in Deep Structures for the whole set of Derivations is *one-one*. Since all levels of syntactic structure provide essentially uniform representations for particular I – S = A, despite the fact that the interpretation of these varies infinitely according to syntactic context, there must obviously exist some nonsyntactic devices which determine the interpretations of I – S = A partly on the basis of

syntactic context (at some level or set of levels). Thus the need for Interpretive Rules. Clearly, however, such rules must operate not only on the syntactic context but also at least on the semantic interpretation of the Antecedent Structure.

Logically, one can distinguish two different ways in which such Interpretive Rules might operate. First, they might operate directly on the syntactic structure and the Semantic Interpretation of the Antecedent Structure to yield the Semantic Representation of the $I - S = A$, where by 'directly' we mean without the generation of any intermediate structures. Or, secondly, there might be some *sequence* of Interpretive Rules, generating intermediate 'semantic' structures with some of the rules operating on the output of previous rules. In this case, such Interpretive Rules would be producing a 'Semantic Derivation' partly parallel to the properties of syntactic Derivations in having a sequence of structures, although of course the nature of these 'semantic' structures is here left entirely open.¹¹ Schematically then, these two different possible formulations of the Interpretive approach might be given as follows:



¹¹ Thus there is no requirement that the structures produced by the set of Interpretive Rules be of the familiar phrase structure type for the purposes of the ensuing discussion.

Here we have designated the intermediate, nonsyntactic structures generated by the second formulation of the Interpretive approach as *Ghost Structures*. We need not for our purposes specify the nature of such structures beyond noting the obvious, though key, point that they are distinct from any of the syntactic trees generated by the syntactic Base Component or transformational rules.

We shall now argue that these two approaches to $I - S = A$, the Syntactic-Deletion and Interpretive, can be empirically distinguished, even in the vague terms in which we have formulated them, and that the Interpretive approach must be false, the Syntactic-Deletion approach correct. We shall argue this on the basis of a variety of factors, chiefly though through The Missing Antecedent Phenomenon, which will now be described.

III. The Missing Antecedent Phenomenon

It is, of course, often the case that Surface Structure anaphors (not only $I - S = A$) have antecedents in the relevant Surface Structure. So, for example, in

- (7) Harrison didn't marry a nurse but Bill did marry a nurse and now he regrets having married *her*.

the italicized coreferent pronominal anaphor *her* has as antecedent the boxed Surface Structure NP *a nurse*. This might suggest the principle:

- (8) The antecedent element(s) of a Surface Structure anaphor is a constituent or set of constituents present in the Surface Structure.

It is easy to see, however, that (8) is false. Thus:

- (9) It is unwise to stab oneself.

Here the reflexive anaphor *oneself* has no Surface antecedent. However, this case and many others of the same sort can be handled within a transformational approach by rules which delete the antecedents.¹² Thus (8) must be derived from an underlying syntactic representation of schematically the form:

- (10) For one to stab oneself is unwise of one.

This suggests then a replacement of the impossible principle (8) by something like:

- (11) The antecedent element(s) of a Surface Structure anaphor is present in some one of the sequence of syntactic trees in the Derivation terminating in the Surface Structure.

¹² For an analysis of the conditions under which the Antecedents of coreferential pronominal elements may be deleted, cf. Grinder (1971).

(11) is a principle which claims that the antecedent-anaphor relation is purely syntactic, although not Surface-syntactic. (11) is by no means obviously true. Moreover, while we believe that (11) is essentially correct, the truth of such an assumption *in general* plays no role in our argument. The latter depends only on showing that (11) holds *in a certain class of cases*.

Consider now pairs of sentences like:

- (12) a. Harry doesn't have a wife but Bill does have a wife and *she* is a nag.
 b. Harry doesn't have a wife but Bill does and *she* is a nag.

Clearly, in (12a) the coreferent anaphor *she* has the boxed NP as its antecedent. Evidence of this beyond the obvious is provided by:

- (13) *Harry doesn't have a wife and *she* is a nag.

that is, indefinite NP like *a wife* under the scope of negation cannot serve as the antecedents for coreferent anaphors. What then of (12b)? This also contains a pronominal anaphor *she*. But now there is no antecedent NP in the Surface Structure. Nonetheless, from the point of view of interpretation *at least*, (12b) must be described in such a way, that *she* has an antecedent, namely, the element which is the semantic 'object' of the Verb Phrase of which *Bill* is the subject NP.

It is at this point that the different claims of the Syntactic-Deletion and Interpretive approaches to I – S = A become clear and directly relevant. (12b) contains a null occurrence of an I – S = A, interpreted as meaning 'have a wife'. Under the Syntactic-Deletion approach, this anaphor will be derived by deletion from an ancestor structure like the second clause of (12a). Thus, in this structure, there will be a syntactic element to serve as the antecedent of the occurrence of *she* in (12b). This reveals a fundamental fact, namely:

- (14) The Syntactic-Deletion approach to I – S = A is consistent with Principle (11) in cases like (12b).

However, crucially:

- (15) The Interpretive approach to I – S = A is *not* consistent with Principle (11) in cases like (12b).

(15) should be self-evident. Since the Deep Structure ancestor constituent of an I – S = A is, in Interpretive terms, an arbitrary element, it is clear that the sequence of syntactic structures possible as a Derivation for a sentence like (12b) can contain no structure providing the pronoun *she* with a *syntactic* antecedent. In other words, the Interpretive approach is logically committed to a theory of antecedent-anaphor relations in which the antecedents are, in some cases at least, *not syntactic elements*. The lack of generality involved in such a view is no doubt an immediate serious deficiency

of this theory, although we can imagine an enthusiast attempting to regain generality in the face of examples like (12b) by claiming that *all* antecedent-anaphor relations are nonsyntactic. This is obviously an impossible view since such relations are in general governed by a variety of (often quite ad hoc and semantically arbitrary) syntactic constraints.¹³ But this need not concern us here, however, since we will restrict ourselves to showing that the antecedent-anaphor relations in sentences like (12b) and others of a formally similar type must be regarded as syntactic in nature. And this will suffice for the purposes of the present discussion.

Examples like (12b) are a special case of the general linguistic phenomenon referred to earlier as The Missing Antecedent Phenomenon. This can be characterized in general terms roughly as follows:

- (16) There exist Surface Structure anaphors whose ‘Antecedents’ are themselves ‘inside’ of $I - S = A$.

(16) is intended to be theoretically neutral as far as the choice between the Syntactic-Deletion and Interpretive approaches is concerned. It is for this reason that the key terms in (16) are in quotes. For under the two different approaches, these terms must be interpreted in radically different ways. Thus under the former, for example, the Antecedent of the pronoun *she* in cases like (12b) is present in the underlying syntactic structure of the $I - S = A$, and the notion *inside* is thus interpretable in terms of ordinary constituent inclusion defined over non-Surface Structure trees in the Derivation. That is, the Antecedent of *she* is an NP present in some ancestor constituent which corresponds to the Surface Structure $I - S = A$. In the Interpretive approach, however, the anaphor has no syntactic Antecedent at any level of syntactic structure since the constituent which corresponds to the Surface $I - S = A$ in Deep Structure is in this case an arbitrary element with no internal syntactic structure of relevance. Thus the notion *Antecedent* for cases like (12b) must be reconstructed somehow in non-syntactic, semantic terms, and the notion *inside* must also be relativized to the semantic structure assigned to $I - S = A$ by the Interpretive Rules which assign Semantic Representations to such anaphors.

The Missing Antecedent Phenomenon will provide a factual basis for a class of arguments showing that the Syntactic-Deletion and Interpretive approaches to $I - S = A$ are empirically distinguishable. *A priori* this might seem unlikely since the two are parallel in a certain way. Thus the former in effect merges an infinite number of distinct underlying syntactic constituents into particular $I - S = A$ contingent on the presence of parallel ‘identical’ structures, while the latter takes the restricted set of anaphors as basic and, using the same parallel ‘identical’ structures, maps these anaphors onto an infinite set of Semantic Representations. But (16) provides one way of distinguishing the truth values of the set of claims involved in each

¹³ That there exist a wide variety of restrictions on Antecedent-anaphor pairs which are not correlated with semantic characteristics *per se* is the point of much of the remainder of this paper.

because it shows that not only are I – S = A involved in relations to their Antecedent Structures, but that they are also involved in relations to other sentential elements not part of their Antecedents. It therefore becomes possible to show that the explication of these non-Antecedent relations depends on the structures assigned by the grammar to I – S = A. These structures are vastly different in the two conflicting accounts. Therefore, one can confirm one and disconfirm the other if it can be shown that the structure one provides but the other does not is required for the explication of relations between I – S = A and elements which are not their Antecedents of the sort exemplified by (16).

IV. The Syntactic Nature of Missing Antecedents

A. Introduction

We shall now present a variety of distinct arguments showing that the relations between various anaphors and their Missing Antecedents ‘inside’ of I – S = A must be regarded as syntactic relations, with the Antecedents themselves as syntactic constituents. Such a demonstration, showing that The Missing Antecedent Phenomenon must be described in accord with Principle (11) above, automatically disconfirms the Interpretive approach while supporting the Syntactic-Deletion approach, as (14) and (15) show.

Consider first examples like:

- (17) a. My uncle doesn't have a spouse but your aunt does and *he* is lying on the floor.
- b. *My uncle doesn't have a spouse but your aunt does and $\{ \begin{matrix} \text{she} \\ \text{it} \end{matrix} \}$ is lying on the floor.

In (17a) the italicized anaphor has its Antecedent ‘inside’ the null Verb Phrase I – S = A. That is, *he* designates ‘your aunt's spouse’. We observe that, in (17b), neither *it* nor *she* can designate ‘your aunt's spouse’. This is what the star means in this case. Thus a reference to ‘your aunt's spouse’ requires a masculine not a feminine or inanimate pronoun form. Under the Syntactic-Deletion theory, the facts in (17) are an automatic reflection of those in (18), where common indices are used to indicate coreference:

- (18) a. My uncle doesn't have a spouse but your aunt does have a spouse, and he_i is lying on the floor.
- b. *My uncle doesn't have a spouse but your aunt does have a spouse_i and $\{ \begin{matrix} \text{she}_i \\ \text{it}_i \end{matrix} \}$ is lying on the floor.

That is, the facts in (17b) are, given the Syntactic-Deletion approach, an automatic reflection of the normal agreement in gender between English third person singular coreferent pronouns and their syntactic NP antecedents.

The Interpretive approach must in this case claim something like the following. The Interpretive Rule or Rules relevant for the I – S = A in such cases assign the anaphor a reading which includes a representation of the semantic element designating the 'spouse of your aunt'. It is a semantic fact that the spouse of an aunt is a male. Consequently, the structure assigned by the Interpretive Rule contains sufficient information to predict facts like those in (17), even without making use of the parallelism to (18). While some objections could be made to this claim, we shall not pursue them here since both the Syntactic-Deletion and Interpretive approaches are at this point equally vague about how such agreement facts are to be stated in cases where the agreement depends on semantic properties. So far then, the approaches remain empirically indistinguishable.

B. Some *THEM* Cases

Consider next the examples:

- (19) a. Harry sank a destroyer, and Bill sank a destroyer, and they_{t,f} both went down with all hands.
- b. Harry sank a destroyer and so did Bill and they both went down with all hands.

There is a reading of (19a) such that *they* is a coreferent of the pair of NP *a destroyer_i* and *a destroyer_j*. This is a case, not at all uncommon in English, where a plural pronoun has *split antecedents*.¹⁴ The crucial fact is that, for many, if not for all, speakers of English, *they* in (19b) is interpretable as referring jointly to the pair of sunk destroyers. Under the Syntactic-Deletion theory of I – S = A, this is a direct consequence of the interpretive possibilities in (19a), and requires no special statement in the grammar at all. But what of the Interpretive theory of I – S = A in such cases?

Such a theory is apparently involved in the claim that the plural pronoun *they* in such cases has two antecedents, one of which is a syntactic element, the NP *a destroyer_i* in the first clause of (19b), and the other of which is some kind of nonsyntactic element produced by the output of the Interpretive Rules. No matter how the rules which link pronouns to their antecedents are formulated, it is difficult to see how it will be possible for the Interpretive approach to avoid ad hoc apparatus and duplication of statement in such cases. This follows from the inability of this theory to handle the anaphor-Antecedent relations in (19b) in a way parallel to those in (19a). The theory is evidently committed to some kind of iterative process in which some of the antecedents of an anaphor are determined from among the syntactic constituents, the process is then held in suspension, and a search is made in the output of Interpretive

¹⁴ For a discussion of conditions on split antecedents, cf. Edes (1968).

Rules. It is not clear that such a theory can actually be formulated. Nonetheless, despite the *prima facie* inadequacy of the Interpretive approach in this case, one must admit that the argument is by no means air tight. Perhaps some really inventive Interpretivist can devise a general way of treating such cases. However, such inventiveness will be beside the point for the rest of the cases to be considered.

C. Nonsemantic Gender

We dealt above with cases like (17), where pronominal reference to a Missing Antecedent was determined in part by gender. However, in cases of that sort the gender involved was natural, i.e. semantic. Consequently, the Interpretivist has the possibility of arguing that the output of the Interpretive Rules provides the relevant information. It is, however, well known that many languages have nonsemantic gender markings for NP, and in such cases pronominal reference is usually controlled by principles requiring anaphors to agree with the semantically arbitrary gender markings of their Antecedents. Thus, if one can find cases where Missing Antecedents partake of this kind of semantically arbitrary gender marking agreement, one will have a completely compelling argument against the Interpretive theory of I – S = A. But such cases exist in languages like German and Italian, to name only two.

Consider first German. There exists in semantically inanimate German NP a three-way distinction of arbitrary (nonsemantic) gender. Selecting three NP which differ in just this respect, it is trivial to construct relevant examples in which Missing Antecedents do partake of arbitrary gender agreement:

- (20) a. *der Tisch* Masculine ‘the table’
- b. *die Lampe* Feminine ‘the lamp’
- c. *das Auto* Neuter ‘the car’

One then finds a distribution of examples including:

- (21) a. Hans wollte keinen Tisch kaufen aber ich wollte (es) und $\begin{cases} \text{er} \\ *\text{sie} \\ *\text{es} \end{cases}$
John wanted no table buy but I wanted (it) and it
war teuer.
was expensive.
- b. Hans wollte keine Lampe kaufen aber ich wollte (es) und $\begin{cases} *\text{er} \\ \text{sie} \\ *\text{es} \end{cases}$
war teuer.
- c. Hans wollte kein Auto kaufen aber ich wollte (es) und $\begin{cases} *\text{er} \\ *\text{sie} \\ \text{es} \end{cases}$ war teuer.

'John didn't want to buy a $\begin{cases} \text{a. table} \\ \text{b. lamp} \\ \text{c. car} \end{cases}$ but I wanted to and it was expensive'.

In Italian, there is a two-way distinction in arbitrary gender for inanimate NP. Thus:

- (22) a. *la macchina* Feminine 'the car'
 b. *il libro* Masculine 'the book'

And again there are cases where Missing Antecedents participate in the process of arbitrary gender agreement for anaphors:

- (23) a. Paolo non puo trovare una macchina ma io posso e mi
 Paul not can find a car but I can and me
 piacerebbe $\begin{cases} \text{guidarla} \\ \text{*guidarlo} \end{cases}$.
 would please to drive it.
- b. Paulo non puo trovare un libro ma io posso e mi
 Paul not can find a book but I can and me
 piacerebbe $\begin{cases} \text{leggerlo} \\ \text{*leggerla} \end{cases}$.
 would please to read it.
 'Paul can't find a $\begin{cases} \text{car} \\ \text{book} \end{cases}$ but I can and I would like to $\begin{cases} \text{drive it} \\ \text{read it} \end{cases}$ '.

Recall that in cases like (21) and (23) the Interpretive theory is necessarily committed to the claim that the pronouns which are governed by the principle of gender agreement have no syntactic antecedents. Consequently, unlike the Syntactic-Deletion view, which accounts for the agreement in examples like (21) and (23) automatically on the basis of the principles that hold between syntactic NP actually occurring in the Surface Structure in examples like:

- (24) a. Ich wollte einen Tisch kaufen aber $\begin{cases} \text{er} \\ \text{*sie} \\ \text{*es} \end{cases}$ war zu teuer.
 I wanted a table buy but it was too expensive.
- b. Ich wollte eine Lampe kaufen aber $\begin{cases} \text{*er} \\ \text{sie} \\ \text{*es} \end{cases}$ war zu teuer.
- c. Ich wollte ein Auto kaufen aber $\begin{cases} \text{*er} \\ \text{*sie} \\ \text{es} \end{cases}$ war zu teuer.

'I wanted to buy a {
 a. table
 b. lamp
 c. car} but it was too expensive.'

and

- (25) a. Io posso trovare una macchina e mi piacerebbe {
 *guidarlo}
 I can find a car and me would please to drive it.
 b. Io posso trovare un libro e mi piacerebbe {
 leggerlo}
 I can find a book and me would please to read it.
 'I can find a {
 car}
 book} and I would like to {
 drive}
 read} it.'

the Interpretive theory must be expanded to contain some special apparatus to handle such facts. Here there are two choices depending on which of the two formulations of the Interpretive approach mapped above in (6) is accepted. If, on the one hand, the Interpretive theory yields no intermediate structures, i.e. no Ghost Structures, but only the Semantic Representation proper of $I - S = A$ as output, the Interpretivist is committed to the claim that Semantic Representations themselves contain arbitrary gender markings. This is obviously an intolerable consequence. Such a result is incompatible with the basic function of Semantic Representations, which is to provide identical representations for structures with the same meaning. However, one can form semantically identical NP in such languages which differ in gender markings, for example:

- (26) a. German *der Fernseher* *das Television* 'the television (set)'
 b. Italian *la tavola* *il tavolo* 'the (physical) table'¹⁵

And these partake in the expected way in gender agreement with Missing Antecedents:

- (27) a. Hans wollte keinen Fernseher kaufen aber ich wollte (es) und
 John wanted no television buy but I wanted and
 {
 er
 *sie
 *es}
 war ziemlich billig.
 it was rather inexpensive.
- b. Hans wollte kein Television kaufen aber ich wollte (es) und {
 *er
 *sie
 es}
 war
 ziemlich billig.

¹⁵ The alternation here apparently has its roots in a dialect conflict, where one dialect has the syntactic gender of the item as masculine, another has it as feminine. Speakers on the fringes of these two dialects have absolute optionality of choice with respect to which assignment they make for 'table'.

'John didn't want to buy a television but I wanted to and it was rather inexpensive.'

- (28) a. Paolo non puo trovare una tavola ma io posso e mi
Paul not can find a table but I can and me
piacerebbe { pitturarla }.
{*pitturarlo}.
would please to paint it.
- b. Paolo non puo trovare un tavolo ma io posso e mi piacerebbe
{ pitturarlo }.
{ *pitturarla }.
'Paul can't find a table but I can and I would like to paint it.'

Thus the Interpretivist who opts for this course is committed not only to the existence of some kind of Interpretive Rule which yields the Semantic Representations of I – S = A in the ordinary sense, but also to apparatus which assigns arbitrary gender markings to parts of Semantic Representations. Since this will mean that structures with the same meaning will have different representations, as (26)–(28) show, a further necessity is the existence of a special class of *Equivalence Relations* defined over Semantic Representations differing in gender properties.

To gauge a little better the scope of the ad hoc apparatus required by the Interpretivist here, one can note, as David Perlmutter has pointed out to us, that there exist words whose syntactic gender changes when the syntactic number of that lexical item changes. Thus, for example, in Italian the lexical item for 'egg' is masculine in its singular use but feminine in its plural use. Naturally, since the syntactic gender marking is overt in Antecedent-anaphor pairs in Italian, the pronoun for the singular form is masculine, and for the plural, feminine:

- (29) a. Io voglio avere un uovo e mi piacerebbe { mangiarlo }.
{*mangiarla}.
I want to have an egg and me would please to eat it.
- b. Io voglio avere delle uova e mi piacerebbe { mangiarle }.
{*mangiarli}.
I want to have some eggs and me would please to eat them.
'I want { an egg } and I would like to eat { it },'
'some eggs } and I would like to eat { them }.'

The same restriction appears, of course, in the case of Missing Antecedents:

- (30) a. Paolo non puo trovare un uovo ma io posso e mi piacerebbe
Paul not can find an egg but I can and me would please
{ mangiarlo }.
{ *mangiarla }.
to eat it.

- b. Paolo non puo trovare delle uova ma io posso e mi piacerebbe
 Paul not can find some eggs but I can and me would please
 { mangiarle }.
 {*mangiarli }.
 to eat them.
- 'Paul can't find {an egg
 some eggs} but I can and I would like to eat {it
 them}'.

An Interpretivist would in these cases be forced to claim that the output of the Interpretive Rules contains the information that the Missing Antecedent is masculine if singular but feminine if plural.

In the case of the Interpretive theory which opts for Ghost Structures, the situation is little better. In this view, the arbitrary gender marking can be assigned to the correspondent elements in the Ghost Structures but eliminated from the final output of Semantic Representations proper (by special statement). However, the devices which assign arbitrary gender to Ghost Structures are still a fully excrecent duplication of the syntactic rules. One might note that such devices will not have a completely trivial character. That is, the assignment of gender markings to parts of Ghost Structures is not so simple. This follows since there is no bound on the number of elements in Ghost Structures which must be appropriately distinguished. That is, the number of gender-marked NP in the Antecedent Structure of particular $I - S = A$ is unbounded. Notice that all of the structure and structure assigning apparatus required here is completely independent of whatever devices the Syntax underlying the Interpretive approach must contain for describing the gender marking of syntactic elements with actually occurring Surface Structure Antecedents. In the Syntactic-Deletion theory, however, the devices of gender marking for syntactic objects account fully for the arbitrary gender properties of Missing Antecedents.

The above argument about arbitrary gender agreement suffices in itself to disprove the Interpretive approach to $I - S = A$, for it shows that such a theory is committed to otherwise unnecessary and redundant apparatus of various sorts just because of its failure to derive $I - S = A$ from full syntactic constituents. But we should emphasize that the argument is even stronger than it appears so far. The fault of the Interpretive view is not just that it involves redundant apparatus. To see the real force of the fact that Missing Antecedents participate in arbitrary gender agreement in languages like German and Italian, one must make an important distinction, namely, that between *representing* facts and *explaining* them. We can say that a grammar represents a set of facts for some language if it embodies a description which has these facts as consequences. We can say that a grammar explains a set of facts when it represents them, and, in addition, the choice of apparatus used to represent them follows from some independent principles in the theory of grammar underlying the particular grammar. Thus explaining facts is a much higher, more difficult, and more important

goal. It amounts to discovering a principled reason for the choice of one representation over other logically possible representations consistent with the data.¹⁶

The point here is that even if an inventive Interpretivist could succeed in constructing apparatus capable of representing the fact that Missing Antecedents partake of arbitrary gender agreement in languages like German and Italian, it is *in principle* impossible for such a theory to explain this fact. Since the apparatus required in the Interpretive view is necessarily independent of the apparatus which handles gender agreement for syntactic elements, explanation is necessarily precluded. Observe that the overall theory of grammar containing the Interpretive system would be much simpler if Missing Antecedents did *not* partake of such agreement. In the Syntactic-Deletion approach, however, an explanation is automatically forthcoming, since Missing Antecedents are, in this view, simply ordinary syntactic elements. And if ordinary syntactic antecedents involve gender agreement in language L, then the Syntactic-Deletion approach automatically predicts, with no further statement,¹⁷ that Missing Antecedents involve it too.

Consequently, the Interpretive approach to the fact that Missing Antecedents partake of arbitrary gender agreement is characterizable as follows. This theory could at best provide an incredibly complicated and redundant representation of the facts, but it could in principle never provide an explanation of them. The Syntactic-Deletion theory, on the other hand, provides at once with no special additions both a representation and an explanation. The distinction between just representing facts and both representing them and explaining them will be relevant for most of the following arguments as well, so it should definitely not be lost sight of by the readers.

The argument based on arbitrary gender agreement alone suffices to show the erroneous character of the Interpretive approach to I – S = A. For completeness, however, we shall risk boring the reader by adding a further list of additional arguments, all from English.

D. Anaphoric Island Restrictions

In Postal (1969a) it was pointed out that various semantically identical structures may differ in the possibility of having their parts serve as Antecedents for certain anaphors. Thus as an example consider the contrast between:

- (31). a. Joan bought a painting by Picasso_i because she likes his_i work.
- b. *Joan bought a Picasso because she likes his work.

Although the NP *a Picasso* means ‘a painting by Picasso’, it cannot, in one widespread

¹⁶ The distinction drawn in the text is, of course, in essence that between descriptive adequacy and explanatory adequacy made familiar in Chomsky's writings.

¹⁷ Of course, there is one necessary ordering assumption, namely, that arbitrary gender agreement rules must refer to structure preceding that upon which the deletion rules which produce I – S = A operate. The analogue of this ordering assumption will be seen to apply throughout for all of the restrictions we discuss.

dialect to which the present writers belong,¹⁸ serve as Antecedent for the stipulated coreferent pronoun *his*. Hence, while (31b) is a well-formed Surface Structure, it does not have the reading 'Y bought a painting by X because Y likes X's work'. Similarly:

- (32) a. Harry is one who breeds sheep, because he likes their, smell.
 b. *Harry is a sheepbreeder because he likes their smell.

Again, although *sheepbreeder* means 'one who breeds sheep', it cannot in the relevant dialect serve as the Antecedent for a stipulated coreferent anaphor *their*. In Postal (1969a) it was proposed to refer to constituents like *Picasso*, *sheepbreeder*, etc. as *Anaphoric Islands*. This concept thus reveals that the anaphoric Antecedent possibilities of semantically identical structures can depend on the way these structures are realized syntactically. This fact then offers a basis for possible arguments showing that Missing Antecedents must be regarded as syntactic constituents.

Thus consider:

- (33) a. Max, wasn't put in prison but Joe, was put in prison and he, is still there.
 b. *Max, wasn't imprisoned but Joe, was imprisoned and he, is still there.

(33b) shows that although *imprisoned* means 'put in prison', it is an Anaphoric Island and thus cannot serve as the container of an Antecedent for *there*. But:

- (34) a. Max, wasn't put in prison but Joe, was and he, is still there.
 b. *Max, wasn't imprisoned but Joe, was and he, is still there.

Hence the contrast between the semantically identical but syntactically different *put in prison/imprison* is preserved in cases where these are 'inside' of I – S = A. Under the Syntactic-Deletion theory, this is an automatic consequence, since sentences like (34) will have underlying syntactic structures like (33). But under the Interpretive view, it follows from nothing else. Consequently, in a way exactly parallel to the situation with nonsemantic gender, the Interpretivist is necessarily committed to the addition of further redundant apparatus to build into the output of his Interpretive Rules the syntactic contrast between Anaphoric Islands and non-Anaphoric Islands. Again, of course, there are two alternatives, depending on which form of the Interpretive approach is adopted. But both are equally unpalatable, even from the point of view of just representing the facts. Again, however, even if ingenuity succeeds in meeting *this* requirement, explanation is in principle unobtainable, although both

¹⁸ It seems that for all dialects so far encountered examples like:

(i) A Picasso fell on him.
 (ii) A Picasso proved he was guilty.

do not manifest proper Antecedent-anaphor relationships. It appears that it is thus generally the case that potential Anaphoric Islands are actual Anaphoric Islands in those cases where Antecedent and anaphor are related by a command relation. When this is not the case, as in the examples in the text, dialects differ. The dialects which only have the restrictions when Antecedent commands anaphor do not, of course, provide a basis for the kind of argument we are formulating, which can only be based on noncommand examples. Such dialects are, however, neutral. They do not provide any evidence one way or the other.

a representation and explanation follow directly from the Syntactic-Deletion approach to $I - S = A$. But in Interpretive terms, the correlation between (33) and (34) can never be anything but an *accident*.

Cases like (33), (34) are by no means isolated. Some others include:

- (35) a. Jack didn't throw a pass to Mike but Bill did throw a pass, to Mike and it, won the game.
- b. *Jack didn't pass to Mike but Bill did pass to Mike and it won the game.¹⁹
- (36) a. Jack didn't throw a pass to Mike but Bill did and it won the game.
- b. *Jack didn't pass to Mike but Bill did and it won the game.
- (37) a. Jack didn't cut Betty with a knife but Bill did cut her with a knife, and it, was used as evidence.
- b. *Jack didn't knife Betty but Bill did knife Betty and it was used as evidence.
- (38) a. Jack didn't cut Betty with a knife but Bill did and it was used as evidence.
- b. *Jack didn't knife Betty but Bill did and it was used as evidence.
- (39) a. Schwarz didn't hit a homer yesterday but Jones did hit a homer, yesterday and it, travelled over 400 feet.
- b. *Schwarz didn't homer yesterday but Jones did homer yesterday and it travelled 400 feet.
- (40) a. Schwarz didn't hit a homer yesterday but Jones did and it travelled 400 feet.
- b. *Schwarz didn't homer yesterday but Jones did and it travelled 400 feet.
- (41) a. The jury didn't find Bill guilty but the jury did find Joan guilty although she wasn't.
- b. *The jury didn't convict Bill but the jury did convict Joan although she wasn't.
- (42) a. The jury didn't find Bill guilty but did Joan although she wasn't.
- b. *The jury didn't convict Bill but did Joan although she wasn't.
- (43) a. Max didn't take his clothes off but Joe did take his clothes, off because they, were dirty.
- b. *Max didn't disrobe but Joe did disrobe because they were dirty.
- (44) a. Max didn't take his clothes off but Joe did because they were dirty.
- b. *Max didn't disrobe but Joe did because they were dirty.

We thus see that Missing Antecedents are subject to the full range of Anaphoric Island restrictions, as predicted by the Syntactic-Deletion theory of $I - S = A$.

¹⁹ Notice that the pronoun in this and certain following examples has an irrelevant interpretation, namely, as a sentential pronoun. Thus the third clause of (35b) can be understood to mean 'Bill's passing to Mike won the game', that is, to refer to the fact rather than the pass.

To make the argument even more complete, we need only take note of some so far unpublished observations of William Watt. He observes that the generally valid constraints preventing coreferent anaphoric pronouns from having their Antecedents inside of verbs are, for some reason, suspended, in the case of a semantically natural class of verbal elements describing processes by which the bodies of living creatures excrete substances. Hence, unexpectedly:

- (45) a. Someone must have bled on the rug because it stained the floor underneath.
- b. Someone must be puking in the next room because I can smell it.
- c. Someone must be pissing in the sink because it's running down the counter.

In these examples, it is perfectly possible for the occurrences of the pronoun *it* to refer to the excreted substances involved in the processes designated by the verbs. Therefore, the Syntactic-Deletion approach automatically predicts the acceptability of examples like:

- (46) a. Harry didn't bleed on the rug but George did because it stained the floor.
- b. Max didn't puke in the car but George did and you can still smell it.
- c. Mary didn't piss in the sink but Louise did and it got on the sponge.

But for the Interpretivist, the correlation between (46) and (45) is necessarily a further collection of accidents.

E. Other Restrictions

[1] *Remarks.* We are concerned here in Part IV of this study with showing that Missing Antecedents are constrained by nonsemantic restrictions on ordinary syntactic constituents, thus showing that Missing Antecedents are syntactic Antecedents. So far, we have dealt with cases of split antecedents for *them*, arbitrary gender restrictions, and Anaphoric Island restrictions. In this subsection we will consider a variety of other heterogeneous restrictions manifested by Missing Antecedents.

[2] *Unspecified NP Deletion.* Sentence pairs like the following:

- (47) a. Max mentioned to someone that Greta was a werewolf.
- b. Max mentioned that Greta was a werewolf.
- (48) a. Max ate something.
- b. Max ate.
- (49) a. Mary was attacked by something.
- b. Mary was attacked.

reveal the existence of a rule, call it UNSPECIFIED NP DELETION, which drops unspecified,

indefinite NP in certain contexts.²⁰ As observed in Postal (to appear a) and studied in detail in Grinder (1971), there is for a dialect common to many speakers a contrast in Antecedent possibilities for unspecified NP depending on whether they are elided by UNSPECIFIED NP DELETION. Hence:

- (50) a. Mary was attacked by someone_i, but was unable to identify him_i to the police.
 - b. *Mary was attacked (by someone_i) but was unable to identify him_i to the police.
 - (51) a. John ate something_i, and it_i gave him heartburn.
 - b. *John ate (something_i) and it_i gave him heartburn.²¹
- ↓
Ø

However, strikingly, the contrast in Antecedent behavior between deleted and undeleted unspecified NP is preserved for Missing Antecedents:

- (52) a. Harry didn't eat anything but Gladys did and it gave her heartburn.
- b. *Harry didn't eat but Gladys did and it gave her heartburn.²²
- (53) a. Mary wasn't attacked by anyone but Sally was and it was only by accident that he was caught.
- b. *Mary wasn't attacked but Sally was and it was only by accident that he was caught.

Under the Syntactic-Deletion approach, the contrasts in (52), (53) are automatically both represented and explained by the restrictions in sentences like (50) and (51). In this case, the Interpretivist must add apparatus to redundantly keep track in the output of his Interpretive Rules of the difference between semantically identical structures like *attacked by something* and *attacked*. How this could be done is not clear, but obviously some purely ad hoc markings will be required. But even such otherwise unmotivated structure assignment can at best provide a representation. Explanation in such terms is impossible. Surely one could hardly find more damaging counter-examples to the Interpretive view than the fact that the syntactic distinction between deleted and nondeleted NP shows up even 'inside' of I – S = A.

[3] Some Quantifier NP Constraints. Quantifier NP like *everyone*, *every doctor who Sally*

²⁰ Notice that this argument remains as is even under a system of grammar in which no deletions are envisioned since the Semantic Representations of, for example (49a), (49b) are effectively equivalent. Thus whether the structures in the *b* versions of the sentences in the text are derived from structures like those underlying the *a* versions by a rule of deletion, or whether they are generated directly in the Base Component is irrelevant. The argument retains its force.

²¹ G. Lakoff has pointed out to us that for some speakers examples like (50b) are well-formed, while those like (51b) are not.

²² Cf. footnote 19.

dated, etc., can, in some syntactic contexts, serve as the Antecedents for singular co-referent pronouns, which are understood as bound by the quantifier. Hence:

- (54) a. Everyone_i feels he_i is a decent person.
b. Every doctor_i who Sally dated claims she was cruel to him_i.

There are, however, many contexts, roughly those where the antecedent does not both command and precede the anaphor, where such Antecedent-anaphor relations are blocked:

- (55) a. *Mary loves everyone_i, but he_i doesn't love her.
 b. *The cop who interrogated every suspect_i conversed with the reporter
 who wrote about him_i.

But, once more, these restrictions are manifested by Missing Antecedents in the same way as by actual Surface Structure-occurring Antecedents:

- (56) a. *Maxine didn't insult everyone she ever dated but Gladys did and he insulted her too.
b. *Nancy didn't call up every officer she knew but Lydia did even though she expected him to hang up on her.

Again the Syntactic-Deletion approach provides at once a representation and an explanation of the properties of the Missing Antecedents on the basis of the properties of Surface Antecedents in sentences like (55). But the Interpretive theory provides neither, and must add special apparatus just to achieve a representation. Explanation remains unattainable, however.

[4] *A Backwards Pronominalization Constraint.* As is now well known, in general (cf. Langacker 1969, Postal 1968, Ross 1969) backwards pronominalization is possible between a coreferential pronoun in a relative clause and an Antecedent on its right. Hence:

- (57) a. The worker who painted it, later blew up the new house.
b. Doctors who interviewed them, reported that the killers, were sane.

However, there is a previously unnoticed constraint on such Antecedent-anaphor relations in several cases, of which we will take those involving the peculiar element *same* as illustrative:

- (58) a. *The worker who painted it_i lives in the same house_i {as Max
that Max does}.

b. *The doctors who interviewed them_i claimed that they had discussed
the same killers, as Jack.

In short, NP containing initial *the same* are not appropriate backwards Antecedents

for pronouns in certain²³ relative clauses, and this fact must be represented by some constraint in the grammar of English.

It can be observed though that this restriction is manifested even when *the same* is not present in the Surface Structure but is 'inside' of an I – S = A:

- (59) Max didn't vote for the same candidate as George but the senator who nominated him did.

Here the second clause Verb Phrase is interpreted to mean 'voted for the same candidate as George'. But it is impossible to interpret (59) in such a way that *him* designates the candidate for whom George voted. Under the Syntactic-Deletion approach to I – S = A, the properties of (59) are both represented and explained by the restriction in sentences such as (58), under the assumption that one underlying structure for (59) would be:

- (60) Max didn't vote for the same candidate as George but the senator who nominated him voted for the same candidate as George.

to which the restriction illustrated in (58) applies directly. For the Interpretivist, however, the properties of (59) must remain a mystery.

[5] *OATS* as Antecedent. Compared with such regular items of its semantic class as *wheat*, *corn*, etc., the noun *oats* involves a number of peculiarities relating chiefly to the category of number. Most crucially for our purposes, in the dialects of the present writers, *oats* cannot serve as Antecedent for any pronouns which morphologically indicate number. Hence there are such contrasts as:

- (61) a. Wheat in itself cannot prevent whooping cough.
 b. *Oats in itself cannot prevent whooping cough.
 c. *Oats in themselves cannot prevent whooping cough.
- (62) a. The wheat Harry bought seems to be regenerating itself.
 b. *The oats Harry bought seem to be regenerating itself.
 c. *The oats Harry bought seem to be regenerating themselves.
 d. The oats Harry bought seem to be self-regenerating.
- (63) a. Harry bought some wheat, and ate it, for dinner.
 b. *Harry bought some oats, and ate it, for dinner.
 c. *Harry bought some oats, and ate them, for dinner.

²³ In a forthcoming paper (Postal, to appear c) it will be argued that constraints like those in (58) are a function of the same general constraint, operative in some dialects, that yields such violations as:

- (i) a. *Who, did the girl who called him, write a letter to.
 b. *The general, who, the fact that he, captured the town was unimportant to.
 c. *The general,, to whom, the fact that he, captured the town was unimportant.

The constraint in (i) is discussed in Postal (to appear b). The relation between (i) and (58) is crucial since, if identity can be established between the restrictions, it provides a strong argument for the claim that elements like *same* in sentences like (58) must be *lowered* into relative clauses from higher clauses, a type of derivation which is controversial. For example, Chomsky (to appear) claims that grammars can contain no lowering rules whatever.

- (64) a. The oats_i, that_i, Harry bought infected Louise with mites.
 b. The oats_i, which_i, Harry sprayed, cannot be used now.

Hence the pronominal forms *self*, *that*, and *which* in (62d), (64a, b) respectively are only well-formed with Antecedent *oats* because they neutralize the number contrast. It thus seems clear that English contains some restriction which can be sketched as:

- (65) A Derivation is ill-formed if it contains a structure in which an NP whose head is the lexical item *oats* is the Antecedent for coreferential anaphoric pronouns which morphologically mark the contrast singular/plural.²⁴

But, crucially, the ill-formedness predicted by (65) manifests itself also in the case of Missing Antecedents:

- (66) *Harry didn't buy any oats but George did and he is going to eat {it
 them}
 now.

The impossibility of sentences like (66) is both represented and explained by the Syntactic-Deletion theory, which assigns the second clause of (66) an underlying structure actually containing an occurrence of the item *oats* making (65) applicable to the Derivation of (66). But for the Interpretivist, no such structure is assigned and the correlation between (61)–(63) and (66) is accidental. Merely to achieve a representation of the restriction in (66), the Interpretivist must obviously build into his Interpretive Rules a duplication of the effect of (65). But, since he cannot use (65) to represent the facts of sentences like (66), no explanation of the correlation between (61)–(63) and (66) is possible in Interpretive terms.

²⁴ J. R. Ross has pointed out to us that (65) should refer not simply to *coreferential anaphoric pronouns* but specifically to Surface Structure manifestations of these. That is, in his dialect there is a contrast between:

- (i) *The tomatoes that Harry bought are regenerating themselves but the oats that he bought aren't regenerating themselves.
- (ii) The tomatoes that Harry bought are regenerating themselves but the oats that he bought aren't.

The difference is that the offending pronoun has been deleted in (ii). We are not firm on our judgements here. It is possible there is a dialect split, with some speakers following (i) and (ii), and others rejecting both. For the latter dialect, if it exists, the appropriate version of (65) would not mention Surface Structure.

A constraint like (65) is not representable within the terms of any hitherto proposed theory of linguistic rules. It has a property we can call *transderivational*, that is, the definition, in particular, the phrase 'morphologically mark the contrast singular/plural', must refer to the set of Derivations, not just to the properties of the trees internal to Derivations. It is, we believe, a fundamental fact that language involves such rules. They are, for example, necessary to describe the restrictions on ambiguity found in cases of so-called 'free' nominal order within clauses, an order which does not yield certain expected ambiguities. Similarly, it is only transderivational reference which can explicate the impossibility of coreference in cases like (i), contrasting with (iii):

- (iii) When Max_i and his_i mother_i, came in, {he_i
 she_i} took off {his_i
 her_i} gloves.
- (iv) *When Max_i and his_i father_i, came in, {he_i
 he_i} took off his gloves.

That is, pronominalization in such contexts is also not allowed to be ambiguous, again a transderivational notion. We hope to prepare a paper on this topic in the not too distant future.

[6] *A Restriction on WORTH.* For some reason, one cannot refer anaphorically to the numerical object of the adjective *worth*. Compare:

- (67) a. *Jones is worth 100,000 dollars_i (in Canadian money) and I am going to steal {it_i them_i}.
- b. Jones has 100,000 dollars_i (in Canadian money) and I am going to steal it_i.
- (68) a. *Max is worth so little_i, that it is not worth stealing it_i.
- b. Max has so little_i, that it is not worth stealing it_i.

But, as should by now be expected, the same restriction is found in Missing Antecedent sentences:

- (69) a. *Max isn't worth 100,000 dollars but Pete is and I am going to steal {it them}.
- b. Max doesn't have 100,000 dollars but Pete does and I am going to steal it.

Hence the argument is exactly parallel to that in the previous case concerning *oats*. The grammar of English must contain an analogue of (65) involving objects of *worth* rather than *oats*. But the Interpretivist cannot make use of this analogue to handle sentences like (69). Hence he must duplicate the effect of the analogue with a redundant statement in the Interpretive system, just to achieve a representation. But explanation cannot be achieved.

V. Other Arguments for the Syntactic Nature of Identity of Sense Anaphora

A. Commentary

In Part IV we provided a variety of arguments based on The Missing Antecedent Phenomenon which show that I – S = A must have a derivation from 'full' syntactic constituents, that is, that they must be described in terms of the Syntactic-Deletion theory. In the present section, we will present a range of other arguments independent of The Missing Antecedent Phenomenon.

B. Inclusion Cases

It has been observed (Postal 1969b) that there exists a syntactic constraint on conjoined NP, illustrated by such examples as:

- (70) a. *Max and Mary_i criticized her_i.

- b. *Max_i criticized Mary and him.²⁵
- c. *Max and I criticized me.
- d. *I criticized {me and Max}_i
 {Max and I}.

This restriction was referred to in Postal (1969b) as *The Inclusion Constraint*, henceforth TIC. There is no semantic anomaly involved in examples like (70) since these are equivalent to the perfectly well-formed:

- (71) a. Max criticized Mary_i and she_i criticized herself.
- b. Max_i criticized Mary and he_i criticized himself (too).
- c. Max criticized me and I criticized myself.
- d. I criticized myself and I criticized Max.

It is apparent then that TIC is a restriction on the possible syntactic reflection of certain Semantic Representations. It is not a constraint on the well-formedness of Semantic Representations per se. This is particularly clear in cases like the following, where the Clause Mate structure²⁶ over which TIC is defined is a result of transformational operations, in this case the rule RAISING:

- (72) a. Joe_h believes that we_{h,i} are under surveillance by the FBI.
- b. *Joe_h believes us_{h,i} to be under surveillance by the FBI.²⁷

We observe though that the ill-formedness of structures predicted by TIC shows up even when parts of the relevant structure are 'inside' of I – S = A, for instance:

- (73) a. *George and Edgar didn't criticize me but Max and I did.
- b. *George and Harry didn't criticize Diana_j, but she_j and I did.

Under the Syntactic-Deletion approach to I – S = A, the ill-formedness in (73) follows directly without further statement from the ill-formedness induced by TIC in structures of the form:

- (74) a. *George and Edgar didn't criticize me but Max and I did criticize me.
- b. *George and Harry didn't criticize Diana_j, and she_j and I did criticize her_j.

For the Interpretivist, however, sentences like (73) do not have underlying representations like (74). Consequently, TIC, defined over NP which are Clause Mates, fails to predict the ill-formedness of (73)-type sentences within the Interpretive framework.

²⁵ Notice that *Mary and him* is supposed to represent a single conjoined NP. Thus, if we replace *him* by *himself* we still do not get a well-formed structure under this interpretation of structure, although there is a well formed reading where a clause boundary intervenes between *Mary* and *himself*.

²⁶ Clause Mates are elements which command each other in the sense of Langacker (1969).

²⁷ Notice that the following sentence:

(i) Joe_h believes us_{h,j} to be under surveillance by the FBI.

is perfectly well-formed since the referent of the subject NP is not included in the interpretation of the NP us_{h,j}.

Therefore, just to provide a representation of the facts, the Interpretivist must add an excrecent analogue of TIC to the Interpretive component. But even given success in the formulation of this redundant apparatus, an explanation of the distribution of facts is in principle precluded.

C. The Passive Constraint

Ross (to appear) has pointed out that examples like (75b) are, for very many speakers of English, subtly though definitely ill-formed:

- (75) a. Steve_i said that he_i had kissed Roxanne.
- b. *Steve_i said that Roxanne had been kissed by him_i.

The general form of this syntactic restriction, call it *The Passive Constraint*, which holds only when the pronoun in the *by*-phrase has weak or anaphoric stress, will say something like this: in a complex sentence, the subject NP²⁸ of a verb which commands a complement sentence or relative clause cannot be a coreferent of the passivized *by*-phrase NP in that complement sentence or relative clause.²⁹

Notice now that one finds:

- (76) a. Steve_i kissed Roxanne but he_i denies he_i did (so).
- b. *Roxanne_j was kissed by Steve_i but he_i denies she_j was.
- (77) a. Max_i threatened the students_j but now he_i claims he_i didn't (do so).
- b. *The students_j were threatened by Max_i but now he_i claims they_j weren't.

Given the Syntactic-Deletion theory of the formation of sentences like (76), (77), the facts follow from The Passive Constraint, which predicts the ill-formedness of the sources of (76b), (77b), namely, structures such as:

- (78) *Roxanne_j was kissed by Steve_i but he_i denies she_j was kissed by him_i.
- (79) *The students_j were threatened by Max_i but now he_i claims they_j weren't threatened by him_i.

All that is required is the claim that The Passive Constraint is defined on structures

²⁸ Although previously described in terms of the notion subject, it appears that this can be stated more generally to include any NP in the commanding sentence, since we find examples like the following equally ill-formed:

- (i) *Max told Mary_i that you had been insulted by her_i.
- (ii) *I promised Jack_i that Mary could be visited by him_i.

²⁹ Restrictive relative clause examples include:

- (i) Mary_i called a sailor who she_i had rejected.
- (ii) *Mary_i called a sailor who had been rejected by her_i.
- (iii) Neal_i threatened a pervert who he_i captured.
- (iv) *Neal_i threatened a pervert who had been captured by him_i.

These become relevant in the Appendix, since it is not possible to construct analogues to the Verb Phrase anaphora cases for those involving *one* and *such* using the complement cases.

prior to the application of the deletion rules relating structures like (78), (79) to sentences like (76), (77).

But under the Interpretive approach, sentences like (76b), (77b) are not assigned underlying forms like (78), (79). Hence The Passive Constraint cannot predict the facts of sentences like (76b), (77b). Thus, just to specify the ill-formedness of such examples, the Interpretivist must add an excrescent analogue of The Passive Constraint to the Interpretive component. But this cannot suffice to explain the correlation of restrictions between the I – S = A sentences and those which do not manifest Identity of Sense Anaphora.

D. *The Raising Constraint*

In Postal (1970) it is pointed out that, for many speakers, examples of the form:

- (80) a. *Terry seemed to *Louise_i* to hate her_i.
- b. *Melvin struck *me* as hating me.
- c. *Pete appeared to *Max_i* to have a grudge against him_i.

are ill-formed. The restriction in our dialect seems to be that the italicized NP in such examples, which achieve their postverbal position through operation of the PASSIVE-like rule PSYCH MOVEMENT, cannot be coreferents of any of the NP left in the infinitive gerund phrase after the subject NP of these are moved up into the main clause by operation of RAISING (later becoming the main clause subjects by the same operation of PSYCH MOVEMENT).³⁰ That examples like (80) involve no inherent semantic anomalies is intuitively clear and further supported by the well-formedness of their close paraphrases in which RAISING has not applied:

- (81) a. It seemed to *Louise_i* that Terry hated her_i.
- b. It struck me that Melvin hated me.
- c. It appeared to *Max_i* that Pete had a grudge against him_i.

Let us refer to the constraint illustrated in (80) as *The Raising Constraint*. Expectably, this restriction determines the well-formedness of certain I – S = A structures:

- (82) a. *George_h doesn't hate Louise_i but he_h seems to her_i to hate her_i.
- b. *George_h doesn't hate Louise_i but he_h seems to her_i to.
- c. George_h doesn't hate Louise_i but it seems to her_i that he_i does.

Compare this paradigm with the following, where there is no coreference between raised NP and the post-*to* NP:

- (83) a. George_h didn't hate Louise_i but he_h seemed to John to hate her_i.

³⁰ Examples with RAISING where the raised NP is later subject to PASSIVE rather than PSYCH MOVEMENT work in an analogous fashion:

- (i) *Terry was proved by Joan_i to love her_i.
- (ii) *Marilyn was reported by the cop_i to have hit him_i.

- b. George_h didn't hate Louise_i, but he_h seemed to John to.
- c. George_h didn't hate Louise_i, but it seemed to John that he_h did.

Under the Syntactic-Deletion approach to $I - S = A$, the ill-formedness of examples like (82a), which follows from The Raising Constraint, predicts that in examples like (82b). But, under the Interpretive approach, (82a, b) are unrelated syntactically by deletion. Consequently, again, as in previous cases, an otherwise unnecessary duplication of a restriction needed in the grammar must be made somehow in the output of the Interpretive Rules, just to achieve a representation. But explanation cannot be achieved.

E. Cases Involving Pronoun Identity

[1] *Remarks.* It is well-known that sentences such as:

- (84) Pete painted his house and so did his father.

are ambiguous, having one reading on which the painted house referred to in the second clause is the same as that in the first clause, and another on which the house referred to in the second clause belongs to the entity referred to by the subject NP of the second clause. However, for many speakers of English, including both of the present writers, this ambiguity is *not* present in sentences like:

- (85) Pete painted his house and so did his mother.

Only the reading on which Pete and his mother paint the same house is associated with (85). At the same time, sentences like:

(86) Max and Bob painted their earlobes purple and so did Joan and Gladys.
are ambiguous, like (84).

Under the Syntactic-Deletion approach to the anaphora in such cases, the contrast between (84) and (86) on the one hand and (85) on the other is relatively easily describable. The relevant reading of (84) would, under this approach, have to come from the remote structure:

- (87) Pete_i painted his_i house and his father_j painted his_j house too.

The relevant reading of (86) would have to come from:

- (88) Max_i and Bob_j painted their_{i,j} earlobes purple and Joan_k and Gladys_l painted their_{k,l} ear lobes purple too.

Finally, the relevant reading of (85) would have to be derived from a more remote structure of the form:

- (89) Pete_i painted his_i house and his mother_j painted her_j house too.

But now there is a clear formal contrast between the structure (89) and the structures

(87), (88). Namely, the Verb Phrases in the latter two representations are superficially identical, *including the form of the genitive pronoun*. In (89), however, the forms of the pronouns differ. Hence the facts in this class of cases, however it is to be characterized precisely,³¹ can be accounted for by imposing an appropriate identity condition on Derivations produced by the rule which carries out the deletion involved in Verb Phrase Identity of Sense Anaphora. This condition will predict that sentences of this type will lack the relevant reading whenever the independently needed syntactic agreement rules differentiate the forms of the pronouns. Thus this account explains why plural cases never lack the extra reading in terms of the fact that the agreement rules never generate sex-differentiated plural forms in English.

For the Interpretivist, however, the syntactic facts of pronoun identity illustrated in (87)–(90), which fully correlate with the readings of (84)–(86), cannot be used to provide even a representation of the reading distribution. In such an approach, an ad hoc method must be found to distinguish cases like (85) from those like (84) and (86). It is not obvious to us what this could be, but even if such can be constructed, it must in principle fail to provide an explanation for the correlation of reading gaps with pronoun agreement facts.

It should be noted that in the set of dialects manifesting the *Pronoun Identity Condition* (henceforth: PROIC) the requirement of identical superficial form is not at all restricted to genitive pronouns, but governs both ordinary plain pronouns, like *he* and *she*, and reflexives. Hence:

- (90) a. John said he had hepatitis and so did Max.
- b. John said he had hepatitis and so did Mary.
- (91) a. Max criticized himself and so did Bob.
- b. *Max criticized himself and so did Barbara.^{32,33}

³¹ We restrict ourselves here to cases where the potential match is between third person elements. There seems to be further differentiation and variation in cases involving nonthird persons. Thus one of the present writers accepts (i) but rejects (ii):

- (i) Max shot himself and so did I.
- (ii) I shot myself and so did Max.

But the treatment of such examples has no bearing on the argument in the text.

³² Comparing (91b) with (85), one notices that, in the dialect group under discussion, the former lacks an 'expected' reading, while the latter is ill-formed. This contrast follows chiefly from the fact that, given PROIC there is one underlying structure for (85) meeting PROIC, but none for (91b) which meets this condition. The latter in turn follows from the fact that in clauses like:

- (i) Barbara criticized herself.

the reflexive form must agree with the subject NP. Genitive pronouns, like those in (85), do not have such positionally restricted Antecedents.

³³ Footnote 32 deals with one aspect of the ill-formedness of (91b), namely, why it lacks a reading parallel to (91a), which follows in our terms from PROIC. However, there is a further problem here. For many, probably most, speakers, neither (91a) nor (91b) has a reading of the form:

- (i) x criticized x and y criticized x.

Such a restriction is quite general. It is presumably the same as that which also blocks:

Only the *a* examples in (90) and (91) have the relevant reading, a fact which follows from the differences in pronoun form produced by the agreement rules in the remote structures necessarily provided by the Syntactic-Deletion approach, namely, respectively:

- (92) a. John said he had hepatitis and Max said he had hepatitis too.
- b. John said he had hepatitis and Mary said she had hepatitis.
- (93) a. Max criticized himself and Bob criticized himself too.
- b. Max criticized himself and Barbara criticized herself.³⁴

We thus see how the condition PROIC provides a powerful argument against the Interpretivist theory of I – S = A on the basis of examples like (84)–(86), (90), and (91). The condition can also be used to construct a variety of further arguments.

[2] *Idiomatic Lexicalization.* There are a number of semantic representations which are realizable in different syntactic forms. Thus:

(94) Semantic Representation Some Lexicalizations	
a. CRAZY	<i>crazy</i> <i>be out of X's mind</i> <i>be off X's rocker</i> <i>lose X's marbles</i>
b. COMMIT A VERBAL BLUNDER	<i>commit a verbal blunder</i> <i>put X's foot in X's mouth</i>
c. MAKE STRENUOUS EFFORTS	<i>make strenuous efforts</i> <i>beat X's brains out</i>

The fact that some of the alternative lexicalizations contain a pronoun must mean, in a theory containing PROIC, that these semantically equivalent though morpho-

(ii) *Max criticized Mary, and so did she.

which would have the underlying form:

(iii) x criticized y and y criticized y.

It is evident that what is involved here is the difference, at the point where the deletion of the Verb Phrase would take place, between reflexive and nonreflexive pronouns. Thus (i) would yield *criticized himself* as the Antecedent of *criticized him*, while (iii) would yield *criticized her* as the Antecedent of *criticized herself*. It is not clear whether these restrictions can be combined with PROIC as part of a single general constraint. If not, they presumably provide a further independent argument of the same sort, and illustrate further the remarks of footnote 4 that Verb Phrase anaphora involves both semantic and superficial conditions. That is, both (i) and (iii) define structures which meet the semantic identity condition for Verb Phrase anaphora, but they still do not yield well-formed outputs.

³⁴ For us, addition of the word *too* to the end of (93b) also yields an ill-formed structure. The contrast with (93a) then suggests that the distribution of *too* is also in part governed by PROIC, or a similar condition. We have not investigated this matter, however.

logically distinct expressions will behave differently with respect to the phenomenon brought up in the preceding section. And this is the case:

- (95) a. Max is crazy and so is his mother.
- b. *Max is out of his mind and so is his mother.
- c. *Max is off his rocker and so is his mother.
- d. *Max has lost his marbles and so has his mother.
- (96) a. Marvin committed a verbal blunder and so did his mother.
- b. *Marvin put his foot in his mouth and so did his mother.
- (97) a. George will make strenuous efforts to solve that problem and so will his mother.
- b. *George will beat his brains out trying to solve that problem and so will his mother.

The Syntactic-Deletion approach to such I – S = A, based on a grammar containing PROIC, accounts for such deviancy automatically. Thus an example like (95d) is predicted by the ill-formed underlying structure:

- (98) *Max has lost his marbles and his mother has lost his marbles too.

which is the only possible source for (95d), given PROIC. That is, under the Syntactic-Deletion theory, there must exist a stage in the Derivations of nonsentences like (95d) where PROIC may refer to the identity or not of actually occurring pronouns. Notice that, unlike examples such as (84)–(86), where PROIC is needed to determine ambiguity or not, those like (95d) are (like (91b)) marked as *ill-formed* simply because underlying structures like the second clause of (98) are ill-formed when the pronoun does not agree with the subject NP. Thus in cases like (95d) the ill-formedness is a result of the incompatibility of PROIC on the one hand and the agreement with subject NP condition required by phrases like ‘lose X’s marbles’ on the other.

For the Interpretivist, however, the facts in (95)–(97) are neither represented nor explained by PROIC, since he is committed to a Derivation of such sentences at no stage of which does there exist a syntactic object to which PROIC may refer. Thus it is necessary for the Interpretivist to maintain that the deviancy of sentences like (95b, c, d) is to be represented in some way independently of the ill-formedness of structures like (98). But this must mean the addition of some apparatus duplicating PROIC, just to achieve a representation. Explanation is, of course, unreachable.

[3] *Nonidiomatic Lexicalization.* Results exactly parallel to those in the previous section obtain if one considers the behavior of alternative nonidiomatic lexicalizations such as:

- | (99) | Semantic Representation | Some Lexicalizations |
|------|-------------------------|--|
| a. | MOVE X’S TONGUE ACROSS | <i>lick</i>
<i>move X’s tongue across</i> |

- | | |
|-------------------------|-----------------------------|
| b. STRIKE WITH X'S FIST | <i>strike with X's fist</i> |
| | <i>punch</i> |
| c. WRAP X'S ARMS AROUND | <i>wrap X's arms around</i> |
| | <i>hug</i> |

The examples which then disconfirm the Interpretive theory of I – S = A are then trivially:

- (100) a. Milton licked some postage stamps and so did Patricia.
- b. *Milton moved his tongue across some postage stamps and so did Patricia.
- (101) a. Rebecca punched the balloon and so did Michael.
- b. *Rebecca struck the balloon with her fist and so did Michael.
- (102) a. Judy hugged the teddy bear and so did Paul.
- b. *Judy wrapped her arms around the teddy bear and so did Paul.

[4] *Optional Reflexives.* In the dialects of the authors, there is a set of verbs which are transitive but unusual in that in case their object NP is a reflexive pronoun coreferential with the subject NP, its presence in Surface Structure is optional. Thus, one finds such sentences as:

- (103) a. Sue dressed herself in no time at all.
- b. Sue dressed in no time at all.
- (104) a. Sue cleaned herself up in no time at all.
- b. Sue cleaned up in no time at all.
- (105) a. Sue prepared herself for the ordeal.
- b. Sue prepared for the ordeal.
- (106) a. Max behaved himself at the party.
- b. Max behaved at the party.

PROIC then predicts correctly the following contrasts, if it is associated with a grammar based on the Syntactic-Deletion theory of I – S = A:

- (107) a. *Sue dressed herself in no time at all and so did Bob.
- b. Sue dressed in no time at all and so did Bob.
- (108) a. *Max behaved himself at the party and so did Lucille.
- b. Max behaved at the party and so did Lucille.

Thus any theory, like the Interpretive approach to I – S = A, which is committed to describing examples like (107)–(108) without reference to full clause underlying structures, must miss the generalization that PROIC both represents and explains the facts in such sentences.

[5] *SELF-Compounds.* Regardless of how one conceives of the derivation of *self-comp-*

pounds, it seems clear that the Semantic Representations of the sentences in (109) are essentially identical to those of the respective counterparts in (110):

- (109) a. Charles has a great deal of control over himself.
- b. Lynn has developed confidence in herself.
- c. Joe has just finished a new portrait of himself.
- (110) a. Charles has a great deal of self-control.
- b. Lynn has developed self-confidence.
- c. Joe has just finished a new self-portrait.

As might well be expected by this point, although the Semantic Representations of such pairs are the same, their syntactic behavior in Verb Phrase deletion contexts differs as predicted by PROIC:

- (111) a. *Charles has a great deal of control over himself and so does Ann.
- b. Charles has a great deal of self-control and so does Ann.
- (112) a. *Lynn has developed confidence in herself and so has George.
- b. Lynn has developed self-confidence and so has George.
- (113) a. *Joe has just finished a new portrait of himself and so has Mary.
- b. Joe has just finished a new self-portrait and so has Mary.

[6] *Summary.* We have shown in the preceding five sections that there exists a relatively simple condition on pronoun shape identity, which, if incorporated into a grammar of English (better: grammars of certain dialects of English) both represents and explains the variety of contrasts illustrated in [1]–[5]. All that is necessary is that the relevant condition, PROIC, be defined on structures no less remote than the level upon which the actual deletion rule operates. In this respect, what must be claimed about the point at which PROIC should be stated is consistent with the claims necessary for every other restriction heretofore mentioned in this paper showing that I – S = A manifest syntactic restrictions. Given PROIC, it is predicted that the Verb Phrase I – S = A possibilities will vary directly with the contrasting third person pronoun shapes produced by the agreement rules in syntactic structures. A single generalization, PROIC, thus suffices within the terms of the Syntactic-Deletion theory to handle all of the diverse cases in [1]–[5].

The Interpretive approach, however, as a matter of principle does not assign the I – S = A-containing clauses underlying structures of the sort on which PROIC could be defined. This theory therefore provides, as far as we can see, no basis at all for the contrasts running through [1]–[5], and would, presumably, have to add several different ad hoc Interpretive principles just to achieve a representation of the facts. But even this will fail to account for the correlation throughout the relevant cases between the I – S = A possibilities of interpretation and the condition of pronoun shape identity definable over ordinary non-I – S = A clauses. That is, this theory

will claim it is a mere accident that in the dialects in question examples of the type given in [1]–[5] systematically exhibit correlations of the sort:

- (114) a. Max said he would go and so did Bob. (ambiguous)
- b. Max_i said *he_i* would go and Bob_j said *he_j* would go. (pronoun shapes identical)
- c. Max_i said *he_i* would go and Bob_j said *he_j* would go. (pronoun shapes identical)
- (115) a. Max said he would go and so did Mary. (unambiguous)
- b. Max_i said *he_i* would go and Mary_j said *he_i* would go. (pronoun shapes identical)
- c. Max_i said *he_i* would go and Mary_j said *she_j* would go. (pronoun shapes different)

or those of the sort:

- (116) a. Max criticized himself and so did Bob.
- b. Max criticized *himself* and Bob criticized *himself*. (pronoun shapes identical)
- (117) a. *Max criticized himself and so did Barbara.
- b. Max criticized *himself* and Barbara criticized *herself*. (pronoun shapes different)

The pronoun identity cases are thus a particularly clear illustration of the fundamental inadequacy of the Interpretive theory of I – S = A, which we have been discussing throughout this paper. That is, these cases show that the properties of I – S = A are determined by certain generalizations stateable over syntactic structures *which the Interpretive theory in principle cannot assign to sentences*.

VI. CONCLUSION

A. *The Nature of the Results*

In the previous five sections we have presented at least a dozen independent arguments which, we believe, at once disconfirm the Interpretive approach to I – S = A and support the Syntactic-Deletion approach. Although we began this paper with a general account of Identity of Sense Anaphora and examples of a variety of types, our examples have systematically been exclusively cases of Verb Phrase anaphora. This might lead naturally to the conclusion that our results are at best valid for this restricted domain. But, as we show in the Appendix below, a number of the arguments are extendable to various other types of I – S = A as well, so the results seem unrestricted in this sense. Thus the conclusions reached here are partly complementary to and partly an extension of five strong arguments for a Syntactic-Deletion approach to Verb Phrase anaphora presented by Ross (1969b).

We should like to stress here that in disconfirming the Interpretive theory what has been shown is not the falsehood of some particular formulation, but rather the erroneous character of a whole class of theories which share a certain property. This property is denial that $I - S = A$ have 'full' syntactic constituents as ancestors in the syntactic Derivation. Any theory which has this feature is disconfirmed by the arguments we have presented. But it is just this property which is the essence of Interpretive theories. Thus the results here are especially strong in that they cannot be avoided by any strengthening of or alteration of the class of Interpretive rules allowed. It is noteworthy that, because of the logic of the situation, we have been able throughout to ignore the nature of these rules without affecting the structure of the discussion. This follows because the nature of these rules is irrelevant for our results, given the denial of syntactic ancestors. Hence it must be emphasized that it is not some specific details of any particular Interpretive account which are mistaken. Given the validity of our arguments, it is the basic idea that $I - S = A$ are not syntactically formed from 'full' underlying syntactic constituents which is untenable.

B. Recent Interpretivist Commentary

Given what has just been said, it will be useful then to consider in comparison the latest attempt to suggest that an Interpretive approach to grammar in general and Identity of Sense Anaphora in particular has some basis. Chomsky (to appear) writes the following:

7.1.2 Before we leave this topic, several other observations are in order. Lakoff notes that it is not just surface structure, but some structure prior to deletion operations that relates to 'logical form'. Consider, for example, the sentence (90):

(90) Jane isn't liked by many men, and Sally isn't either.

We must know, in interpreting this sentence, how *many* functions with respect to the second conjunct. This observation is correct, and would require a modification of Jackendoff's theory of semantic interpretation to permit also consideration of shallow structure (in the sense of note 6) if in fact there is a deletion operation involved in such sentences as (90). There are arguments for the latter hypothesis, but there are arguments against it as well.

Chomsky does not give or refer to any of the arguments in favor of the 'latter hypothesis', that is, the Syntactic-Deletion view, but does immediately give what he considers counterarguments. To continue:

Consider, for example, the sentences (91)–(93):

- (91) John hasn't been here for a month.
- (92) John has been here for a month.
- (93) John hasn't been here for a month, but Bill has.

The sentence (91) is ambiguous: it may mean that for all the time during the last month, John hasn't been here (i.e. when used to deny the assertion (92), for example), or (more naturally), that there is no time during the past month when John was here,

i.e. he hasn't been here even once. But sentence (92) is unambiguous, having only the former interpretation, namely, for all of the time during the last month, John has been here—i.e. he didn't just appear now and then, but spent the whole month here. Sentence (92) cannot have the meaning 'John has been here at some time during the month.' But now consider (93). Where the first conjunct is interpreted (in the natural way) to mean 'it is not the case that John has been here at some time during the month' (i.e. 'there is no time during the month when John was here'), the second conjunct means 'Bill has been here at some time during the month'. Thus if (94) underlies (93), then the second conjunct in (94) has an interpretation which it cannot have in isolation:

- (94) John hasn't been here for a month, but Bill has been here for a month.

There are many similar examples, some of which even have syntactic residues; consider, for example, (95)–(96):

- (95) John won't leave until midnight, but Bill will.

- (96) *Bill will leave until midnight.

In the case of (95)–(96) [one might propose an 'output condition' of an otherwise unmotivated sort that excludes (96) in isolation while permitting it as an underlying conjunct of (95). To extend such a solution to (91)–(93), one would have to say that (92) too is ambiguous, but some sort of 'output condition' eliminates one interpretation when it appears in isolation. Perhaps such a proposal can be given a coherent formulation. But such an enrichment of the theory of grammar seems to me a rather questionable move. More natural, I think, is the conclusion that (93) and (96) are not formed by deletion operations, and that 'compositional semantics' must be abandoned (or at least restricted), with the semantic interpretation in such cases as (93) constructed along lines that have been explored by Jackendoff (1969) and Akmajian (1969)]. (bracketing ours: JG/PMP).

This exhausts what Chomsky has to say about this issue in the work under discussion.

In this passage he then states clearly his belief that the Syntactic-Deletion approach to $I - S = A$ ('compositional semantics' in his terms) must be abandoned, and the Interpretive approach accepted. The proffered evidence for this consists essentially of his examples (93) and (95). Chomsky's conclusion is, however, quite peculiar, even within the framework of assumptions he makes and assumes. He states explicitly that there are several arguments in favor of the Syntactic-Deletion approach, gives one argument against it and without further discussion concludes that the approach must be abandoned. How is this possible? Clearly, we need to know at the very least what the counterarguments are, and what principles dictate that facts like those imputed to (93) and (95) by Chomsky are sufficient to overwhelm the counterarguments and to force acceptance of the Interpretive view. In short, within Chomsky's own terms, his conclusion is unfounded. This becomes especially clear when one notes that the 'arguments for the latter hypothesis' mentioned by Chomsky, but not indicated explicitly or referenced, were particularly strong. Thus Ross (1969b) gives five distinct arguments for the Syntactic-Deletion approach to Verb Phrase anaphora. And while there can be no definitive principles at this point indicating how to weight

arguments for and against particular hypotheses, we do not see how anyone could weigh Ross's arguments alone against the pair of sentences (93), (95) interpreted as Chomsky describes, and conclude that the Syntactic-Deletion approach must be abandoned.

Chomsky's examples (93), (95) are interesting and pertinent to the dispute over how to describe Verb Phrase anaphora and Identity of Sense anaphora in general. Unfortunately, his discussion of them is highly misleading and distorted in ways going beyond those discussed in the previous paragraph. First of all, Chomsky is evidently unaware that the description given of (93), (95) is at best only true of one dialect of American English. Thus for the present writers and nine out of ten other people we have questioned (93) does *not* have the reading he imputes to it. For us, an interpretation of (93) such that it means 'John hasn't been here even once during the month but Bill has been here at least once' is totally impossible. For us, (93) has only the meaning 'it is not a month that John has been here but it is a month that Bill has been here'. This property of (93) is exactly what the Syntactic-Deletion theory predicts on the basis of the independent meanings of the clauses *John hasn't been here for a month*, *Bill has been here for a month* and the requirement of semantic identity for the deleted portions. Similarly, in the case of (95), the example is, for us, simply ill-formed. We have, however, found one speaker who shares Chomsky's judgments about (93) and (95).

It is clear then that the grammatical problems posed by (93) and (95) for linguistic theory include those of dialect variation. What an adequate theory must do is provide the appropriate apparatus for constructing natural grammars of both dialects. It seems to us that the Syntactic-Deletion theory provides the basis for doing this. Consider Chomsky's example (95) first. In our dialect, this sentence, which we repeat here as (118):

- (118) John won't leave until midnight but Bill will.

is ill-formed. This is an automatic consequence of the Syntactic-Deletion theory, given the underlying structure which this approach must assign to (118), namely:

- (119) John won't leave until midnight but Bill will leave until midnight.

since (119) has an ill-formed second clause. That is, this is an automatic consequence, given the assumption which we have seen so often before that the relevant restriction, here the one involving *until*, a restriction which says that with verbs like *leave* this element can only cooccur with a negative, is stated at a level of structure no less remote than that upon which the deletion rule which produces (118) operates. Let us call this restriction The *until* Restriction.

We have seen that The *until* Restriction, stated on a predeletion level of structure, represents and explains the facts of sentences like (118) for the dialect like that

of the present writers. What then of Chomsky's dialect, in which (118) is well-formed, in contrast to sentences like:

- (120) *John will leave until midnight.

which are as ill-formed in his dialect as in ours. Clearly, the natural suggestion in our terms is that the difference between these two dialects is simply in the ordering of the levels of structure on which The *until* Restriction is defined. It would be natural to say that, in Chomsky's dialect, this restriction is defined on a post-Verb Phrase deletion level of structure, quite likely even on the Surface Structure. Hence it only will mark as ill-formed clauses containing *until* with verbs like *leave* in the absence of a negative if the *until* actually shows up in the Surface Structure. This suggestion then permits both dialects to have identical grammars up to the point of ordering of The *until* Constraint. It suggests a general theory of grammar in which there is a freedom of ordering constraints like The *until* Constraint, a class yet to be characterized, with rules of Identity of Sense Anaphora.

Once we realize the dialect split for (95), the apparent argument for Interpretivism vanishes. For the Interpretivist now needs quite different rules for (118) for the different dialects, and, in particular, is unable to relate the ill-formedness of (118) in one dialect to The *until* Constraint.

The situation for Chomsky's example (93) is essentially parallel, except that the constraint involved is more obscure and more directly semantic. That is, we agree with Chomsky in this case that (92) is unambiguous, and this lack of ambiguity carries over to (93), for us. Hence the restriction involved is for our dialect stated at a pre-deletion level of structure. For Chomsky's dialect, however, the restriction blocking the reading of (92) which the second clause of (93) manifests would again therefore have to be stated at a post-deletion level of structure, such that it does not apply if the negative, and the *for a TIME* phrase do not occur in Surface Structure (presumably). Thus a certain consistency for the dialects emerges here which, we imagine, would manifest itself also as a wider class of elements are considered. That is, there is a class of structures which are 'negative polarity' items (cf. Baker 1970), and the difference between our dialect and that of Chomsky in the relevant respect seems to lie just in whether the restrictions on such items are defined on pre- or post-Verb Phrase anaphora structures.

In the section of the quote from his recent paper which we bracketed, Chomsky attempts to give the impression that there will be some difficulty in formulating an approach to his examples (93), (95) which involves 'filters' like The *until* Constraint. He seems to intimate that no coherent formulation can be given of such rules, and states that the Interpretive approach is 'more natural'. He also claims, and this is most extraordinary, that the latter avoids for these cases some 'enrichment of the theory of grammar'. But this is a priori misleading, and in fact backwards. It is the former because at the very least the kinds of 'filters' he rejects and Interpretive rules

are both being considered for addition to the theory of grammar. And what is in part at question is which is the appropriate enrichment. But it is backwards because, as we saw in the case of Chomsky's (95), the appropriate constraint must be in the grammar no matter how Verb Phrase anaphora is described, and all that is required is a variation in ordering, in effect a traditional theoretical device in generative work. An analogous remark holds for sentences like (93), where what is involved is the constraint, necessarily independent of Verb Phrase anaphora, that has (121a) ambiguous, but (121b) not:

- (121) a. John hasn't been here for a month.
- b. John has been here for a month.

To claim that such facts must be described in terms of Interpretive rules is thus to place the enrichment on the side of the Interpretive theory. It is the latter which needs rules of an 'otherwise unmotivated sort', namely, Interpretive rules.

Moreover, Chomsky's discussion of these questions was, from our point of view, carried out in something of a factual vacuum. In particular, the facts must be considered in the light of the arguments given by Ross (1969b) and above in sections IV and V. These show, beyond any doubt in our opinion, that Verb Phrase anaphora must be described by a theory which assigns 'full' underlying syntactic structure. Recall the arguments based on nonsemantic gender, those involving pronoun identity, etc. These therefore show that the approach to (93), (95) which Chomsky considers 'more natural' is in fact impossible. Likewise they show that the 'filter' approach to sentences like (93), (95), etc., which Chomsky suggests without argument cannot be given a coherent formulation, is absolutely necessary, since only this can make such sentences compatible with the 'full' ancestor structure which the earlier arguments show to be necessary. Hence what Chomsky's examples really do, when seen in context, is provide some limited evidence for the need of just the kind of 'filters' which he rejects. In other words, in context Chomsky's observations provide some further basis for attempting to develop a general theory of 'filters', or 'derivational constraints' of the sort which Lakoff and others have been advocating,³⁵ but which Chomsky has rejected (in the very paper quoted from in several places).

It follows therefore that when Chomsky's presentation is looked at within the necessary framework which includes the facts of dialect variation, the independent need for 'filters,' and the fact that the dialect variation can be accounted for in Syntactic-Deletion terms by a variation in the level at which certain 'filters' are specified, the very least that can be said is that the Interpretive theory is unsupported. It seems more likely that such facts should be regarded as a further counterexample, since the latter theory provides no obvious way of relating the grammars of the different dialects, nor of relating the constraints in the anaphora sentences to inde-

³⁵ Cf. Lakoff (1969; 1970; to appear) and Postal (to appear b; to appear d).

pendent constraints whose presence in the grammar is justified without reference to anaphora, like The *until* Constraint.

Summing up, the situation appears as follows. In favor of the Syntactic-Deletion approach to Identity of Sense anaphora are at least the various arguments given by Ross (1969b), the more than one dozen given above in sections IV and V, and the general methodological argument that the Syntactic-Deletion approach can dispense with the special enrichment to linguistic theory that would be involved with Interpretive rules. These arguments are of such scope and depth that even if the two examples brought up by Chomsky had the force he claimed, there would still not be any problem in making a completely definitive theoretical choice. But in fact the examples do not have the force he claimed, and, more generally, we are aware of no single argument in favor of the Interpretive approach to Identity of Sense anaphora. Thus, as far as we can see, the Interpretive theory has been unambiguously disconfirmed. While there are vast problems in attempting to formulate a precise Syntactic-Deletion theory of Identity of Sense anaphora, it appears that this is the only available option that has any chance of being consistent with the spectrum of known empirical fact, in particular, the subpart of this spectrum on which we based the arguments in sections IV, V above.

VII. Appendix: Analogous Examples for Non-Verb Phrase Types

A. Original Example (19)

- (1) a. Harry sank a boat carrying a gorilla, and George sank a boat carrying a gorilla, and they_{i,j}, both drowned.
- b. Harry sank a boat carrying a gorilla and George sank one too and they both drowned.
- c. Harry sank a boat carrying a gorilla and George sank such a boat too and they both drowned.

B. Original Example (21)

- (2) a. Hans kennt keine Frau die einen Tisch kaufen will aber John knows no woman who a table buy wants but Wolfgang kennt solch eine Frau und ich wundere mich Wolfgang knows such a woman and I wonder myself
 warum sie $\left\{ \begin{matrix} \text{ihn} \\ \text{*sie} \\ \text{*es} \end{matrix} \right\}$ kaufen will.
 why she it buy wants.
- b. Hans kennt keine Frau die eine Lampe kaufen will aber John knows no woman who a lamp buy wants but

Wolfgang kennt solch eine Frau und ich wundere mich warum
 Wolfgang knows such a woman and I wonder myself why

sie $\left\{ \begin{matrix} \text{sie} \\ *\text{ihn} \\ *\text{es} \end{matrix} \right\}$ kaufen will.

she it buy wants.

- c. Hans kennt keine Frau die ein Auto kaufen will aber
 John knows no woman who a car buy wants but
 Wolfgang kennt solch eine Frau und ich wundere mich warum
 Wolfgang knows such a woman and I wonder myself why

sie $\left\{ \begin{matrix} \text{es} \\ *\text{ihn} \\ *\text{sie} \end{matrix} \right\}$ kaufen will.

she it buy wants.

'John doesn't know any women who want to buy a $\left\{ \begin{matrix} \text{a. table} \\ \text{b. lamp} \\ \text{c. car} \end{matrix} \right\}$ but

Wolfgang knows such a woman and I wonder why she wants to buy it.'

C. Original Example (23)

- (3) a. Maria non conosce una donna che vuole comprare una macchina
 Mary not know a woman that wants to buy a car
 ma io ne conosco una ma non so perche vuole comprar $\left\{ \begin{matrix} \text{la} \\ *\text{lo} \end{matrix} \right\}$.
 but I of them know one but not know why want to buy it.
 b. Maria non conosce una donna che vuole comprare un libro ma io
 Mary not know a woman that want to buy a book but I
 ne conosco una ma non so perche vuole comprar $\left\{ \begin{matrix} \text{lo} \\ *\text{la} \end{matrix} \right\}$.
 of them know one but not know why want to buy it.
 'Mary doesn't know any women that want to buy a $\left\{ \begin{matrix} \text{a. car} \\ \text{b. book} \end{matrix} \right\}$ but I
 know one (of them) but I don't know why she wants to buy it.'

D. Original Example (33)

- (4) a. Max doesn't know a lady who was put in prison but Joe does know a lady who was put in prison and she is still there.
 b. Max doesn't know a lady who was put in prison but Joe does know one and she is still there.
 c. Max doesn't know a lady who was put in prison but Joe does know such a lady and she is still there.

- d. *Max doesn't know a lady who was imprisoned but Joe does know a lady who was imprisoned and she is still there.
- e. *Max doesn't know a lady who was imprisoned but Joe does know one and she is still there.
- f. *Max doesn't know a lady who was imprisoned but Joe does know such a lady and she is still there.

E. Original Example (66)

- (5) a. *I didn't see a man who bought some oats but George did see a man who bought some oats, and he claims $\{\text{they}_i\}$ made him sick.
- b. *I didn't see a man who bought some oats but George did see one and he claims $\{\text{it}\}$ made him sick.
- c. *I didn't see a man who bought some oats but George did see such a man and he claims $\{\text{they}\}$ made him sick.

F. Original Example (76)

- (6) a. Mary_i kissed a boy who she_i had rejected.
- b. *Mary_i kissed a boy who had been rejected by her_i.
- c. *Mary kissed a boy who had been rejected by Joan_i and so did she_i.
- d. *Mary kissed a boy who had been rejected by Joan_i and she_i kissed one too.
- e. *Mary kissed a boy who had been rejected by Joan_i and she_i kissed such a boy too.

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