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## Deep and Surface Anaphora\*

### o. Introduction

#### o.1. Syntactically and Pragmatically Controlled Anaphora

It has long been known that certain anaphoric expressions, though generally interpreted by reference to some linguistic antecedent, do not *require* such an antecedent, but can be controlled by some aspect of the nonlinguistic (we will say "pragmatic") environment. This is the case, for example, with ordinary definite third person pronouns:

- (1) My brother's a doctor, and *he* says your hair will fall out if you eat that.  
Sue introduced me to *her* mother.  
Anyone who eats that will lose *his* hair.  
If the unicorn were a possible animal, *it* would certainly be a herbivore.
- (2) *He's* saying that your hair will fall out.  
*Her* hands are trembling.  
I hope *it's* a herbivore.

The examples in (1) illustrate syntactically controlled anaphora with definite pronouns. The examples in (2) illustrate instances of what we call *pragmatically controlled* (or *deictic*) anaphora. Each of the examples in (2) is well-formed in a context which, without linguistic antecedent for the pronoun, nevertheless contains enough pragmatic information to allow (more or less) unambiguous determination of its intended referent.<sup>1</sup>

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<sup>1</sup> The examples in (1) can also be read with pragmatic control of the pronoun (some more easily than others) - then of course the pronoun is *not* coreferent with the NP that is its antecedent on the syntactically controlled reading.

The examples in (2), and again also the examples in (1), can be syntactically controlled in discourse as well, with the linguistic antecedent in a previous sentence. It is clear that this intersentential control is syntactic and not just a case of pragmatic control, for the pronoun can, as in the examples in (1), have no real-world referent:

- (i) Do you know what happens to anyone who eats this stuff?  
--Yeah, *his* fair falls out.

What has not (to our knowledge) been observed before<sup>2</sup> is that there are anaphoric processes<sup>3</sup> that *must* be syntactically controlled.<sup>4</sup> Consider the contrast in the following utterance-context events:

- (3) [Hankamer attempts to stuff a 9-inch ball through a 6-inch hoop]

Sag: #It's not clear that you'll be able to.<sup>5</sup>

- (4) [Same context]

Sag: It's not clear that you'll be able to do it.

There is a subtle but distinct difference in acceptability between these two utterances in this context: the anaphoric process that leaves a pro-form *do it* as anaphoric VP can more readily be pragmatically controlled than the process known as VP Deletion, which leaves behind no pro-VP, but only a bare Aux or stranded complementizer.

The utterance in (3) is fine, of course, if there has been previous *linguistic* context in which mention has been made of getting the ball through the hoop:

- (5) Hankamer: I'm going to stuff this ball through this hoop.

Sag: It's not clear that you'll be able to.

For further illustration of the contrast we offer another example:

- (6) a. [Sag produces a cleaver and prepares to hack off his left hand]

Hankamer: #Don't be alarmed, ladies and gentlemen, we've rehearsed this act several times, and he never actually does.

- b. [Same context]

Hankamer: . . . He never actually does it.

## 0.2. Summary of Arguments

In this article we investigate this difference between syntactically and pragmatically controlled anaphora, and show that anaphoric processes are of two kinds, with quite different properties: one, which we will ultimately call "deep" anaphora, which allows pragmatic control and has other properties indicating that the anaphoric relation is determined at an essentially presyntactic level; and another, which we will ultimately call "surface" anaphora, which requires a coherent syntactic antecedent in surface structure and otherwise behaves as a purely superficial syntactic process.

(ii) Is the unicorn a possible animal?

—I don't know, but if it is, it's certainly a herbivore.

<sup>2</sup> Shopen (1972) discusses the possibility of pragmatic control of anaphoric processes in some detail, but does not note the distinction observed here. Dougherty (1969) also discusses pragmatic controllability of pronouns.

<sup>3</sup> We use the term *anaphoric process* to refer to any grammatical device that allows the interpretation of an element to be chosen from an infinite number of potential values, the choice in a particular instance being determined by context. This usage is intended to be neutral as to whether the proper formulation of the grammatical device is a syntactic transformation, an interpretive rule, or whatever.

<sup>4</sup> There are, of course, strictly sentence-internal processes, such as reflexivization, which are and always have been recognized as being strictly syntactically controlled.

<sup>5</sup> We introduce the cross-hatch (#) as an indication that the so marked sentence is incompatible with the indicated context (presuming, of course, the absence of any previous significant linguistic context).

We will proceed by showing first (section 2) that for a given anaphoric process, if there is evidence that the process is a rule involving syntactic deletion, it also is found to require the presence of a linguistic antecedent; where such evidence is lacking, the process is found to allow pragmatic control. While this result may at first glance appear almost tautologous, it is in fact quite surprising, in two respects: (1) That anaphoric relations are established in two quite dissimilar ways forces us to adopt a new and rather complex theory of anaphora; (2) It is by no means a logical necessity that deletion of syntactically present material at a superficial stage should be controllable only by a superficially present *linguistic* antecedent, or that anaphoric relations not involving deletion should be possible between linguistic and nonlinguistic entities.<sup>6</sup> Any other distribution of properties is equally conceivable.

In section 3, we will show that ellipsis processes, like deletion anaphora, require syntactic control. Thus the requirement of syntactic control appears to be a general property of processes involving deletion under identity.

In section 4, we investigate a phenomenon we call Null Complement Anaphora, and show that although the surface form of the anaphor is null, the process is not an instance of deletion anaphora and does allow pragmatic control. This shows that the difference between pragmatically controllable versus strictly syntactic anaphora cannot be correlated with the presence versus absence of an overt pro-form.

We then investigate sentential *so* anaphora, which has been taken by some (e.g. Ross (1972)) to involve the presence of a sentential pro-form, and which does *not* permit pragmatic control.

We conclude at this point that our basic premise is established: there are two classes of anaphoric processes, one involving syntactic deletion under identity, and another (not involving syntactic deletion) that permits pragmatic control from non-linguistic aspects of the discourse situation.

In section 5, we examine another property that distinguishes deletion anaphora from nondeletion anaphora: the latter are shown to require the existence of a coherent semantic entity that the anaphor is taken to represent, while the former do not. This further establishes the essentially superficial nature of deletion anaphora, as opposed to the essentially pragmatic nature of nondeletion anaphora.

In section 6, we discuss the consequences of our result for a general theory of anaphora.

## 1. Background: Proposed and Possible Approaches to Anaphora

In order to place our discussion of anaphora in perspective, we briefly review in this section the major positions regarding the nature of anaphora that have been advanced in previous literature, and we delimit, in the light of present knowledge, the range of theories of anaphora that remain tenable.

<sup>6</sup> Chomsky (1965) imposes a recoverability constraint on syntactic deletions that in effect eliminates the possibility of pragmatic control of deletion processes. This principle is discussed further in Chomsky (1968).

### 1.1. *The Monolithic Theories*

There have been two major (and diametrically opposed) approaches to anaphora that attempt to treat all anaphoric processes as formally alike:

#### (a) *The (Strict) Transformational Position*

This position assumes that all anaphoric processes are transformations that involve deletion (or conversion to a pro-form) of an underlyingly present, fully lexical segment<sup>7</sup> under conditions of identity with an antecedent segment; it assumes further that this process occurs at a relatively superficial stage in derivations,<sup>8</sup> in particular late enough for the precede-command relations referred to by the Backwards Anaphora Constraint (BAC) to be affected by movement rules. This (which by now may be called the "classical" position) is the position assumed in Ross (1967), Ross (1969a), Postal (1970), and virtually all of the early (pre-*Aspects*) transformational literature. It is most recently defended in Postal (1972).

#### (b) *The (Strict) Interpretive Position*

This position assumes that all anaphors (pronominal or null) are present in underlying representations, and that no anaphors are derived transformationally. The anaphoric relation between an anaphor and its antecedent is assumed to be established by an interpretive rule, this interpretation taking place at a relatively superficial level (during the cycle, assumed by Jackendoff (1972), or at surface structure, assumed by Wasow, Shopen, and others for various kinds of anaphora). An extreme version of this position holds that there are no syntactic deletion rules at all (Wasow (1972), Shopen (1972), Fienko (1974)).

1.1.1. *The Syntactic Arguments Against (b).* Position (b), as it was originally conceived, held basically that where there are nonnull pro-forms in the surface, those pro-forms are present as not-further-analyzable constituents from the deepest level of underlying structure; where the surface form of the anaphor is null, either nothing or an unanalyzable null constituent ("delta") has been present from the deepest level.

Position (b) is certainly untenable, in view of the arguments presented in Ross (1969b) (for Sluicing and VP Deletion), Grinder and Postal (1971) (for VP Deletion), and Hankamer (1973) and Morgan (1973) (for ellipsis rules). These works demonstrate clearly, for several particular anaphoric processes, that the deletion analysis is correct (to the extent that the interpretive analysis can be distinguished from a syntactic deletion analysis). These arguments all show that, contrary to the claim of the

<sup>7</sup> We use the term *segment* to mean "constituent or constituents". This use is necessary because the ellipsis processes (see section 3) anaphorize nonconstituents, and it appears likely that in general deletion anaphora rules do too (see Hankamer (forthcoming), Sag (forthcoming), and Ross (1969b)).

<sup>8</sup> The bounded anaphora, i.e. the anaphoric processes restricted to the domain of a single clause or operating across exactly one clause boundary (e.g. Reflexive, EQUI, etc.), must be cyclic transformations in this theory; the unbounded anaphora have been assumed to be cyclic or postcyclic. We are not concerned in this article with bounded anaphora, and for our purposes it does not matter whether the unbounded anaphora are cyclic or postcyclic; these are both "relatively superficial" levels.



strict interpretive position, there is evidence (for certain anaphoric processes) that what appears on the surface as a (null) anaphor must at some stage have a representation as a syntactically complex segment identical to the antecedent segment. These arguments will be reviewed in sections 2 and 3.

The anaphoric processes for which such arguments have been advanced (with one exception, where the argument seems to be mistaken, which we will discuss in detail below (section 2.3)) are all Identity of Sense Anaphora (ISA) involving null anaphors.

In order to evade these arguments, Wasow (1972) proposes a more advanced version of interpretive theory in which the null anaphors in question are syntactically complex. This approach attempts to maintain the claim that anaphors are interpreted at a superficial level, while giving up the claim that all anaphors are syntactically simplex from underlying representations up. With regard to the null anaphors of VP Deletion, Sluicing, etc., then, Wasow's theory agrees with the deletion theory in recognizing that sentences containing such anaphors have at some stage a representation in which the anaphoric segment is syntactically complex, and that this structure can undergo transformational operations up to a fairly superficial level. We can thus agree on calling such anaphors *surface* anaphors, regardless of which analysis is chosen.

1.1.2. *The Syntactic Arguments Against (a)*. Position (a), once widely if not universally accepted among generative linguists, now has few if any adherents. A number of arguments have been brought forth against this position, mainly centering on the treatment of definite pronouns. We review here four representative arguments. It is notable that, first, in no case do the arguments bear on the question of whether pronouns receive interpretation at a superficial level; rather, they show only that the anaphors in question are present as unanalyzable constituents from early stages in derivations. Second, the class of anaphors for which such arguments have appeared is disjoint with the class for which evidence of syntactic complexity has been found. We will call such anaphors, which are arguably simplex from early stages of derivation, *deep* anaphors.

1.1.2.1. *The Bach-Peters Paradox*. The assault on position (a) has centered around the treatment of definite pronominalization; the first step was taken by Bach (1970) with the celebrated Bach-Peters sentences, of which (7) is an example:

- (7) The man who shows he<sub>i</sub> deserves it<sub>i</sub> will get prize<sub>i</sub> he<sub>i</sub> desires.

Bach's argument is sketched in (8):

- (8) Assuming:  
 (a) that pronouns are derived by a transformation from full NPs; and  
 (b) Pronominalization "operates on" full NPs, including relative clauses;  
 then

- (c) the NPs underlying the pronouns in (7) would be infinitely wide and deep in underlying structure, as shown in (7') opposite.

Bach gives two arguments for (8b) and is not willing to accept (8c) ("finite length seems indispensable . . ."). He concludes that assumption (8a) must be given up.

This argument has been probably the greatest single factor in causing the general abandonment of position (a) as a comprehensive theory of anaphora. The argument, however, is not compelling.

First, it is not entirely clear that there is any basis for Bach's assumption (though it appears to have been almost universally accepted) that deep structures cannot be infinite. It is only by convention that such infinite structures are not generated by existing grammars, and at least one of the authors of the present article (Hankamer) fails to see what empirical consequence there is in this convention.

Second, neither of Bach's arguments for (8b) is convincing. The first one is that semantic anomaly arises in cases like the following:

- (9) @My neighbor<sub>i</sub> who is pregnant said that he<sub>i</sub> is very happy.

Bach is not specific about how pronominalization "operates on" full NPs to account for this anomaly; but it does not appear to amount to anything more than the claim that referential identity is established between an entity of which pregnancy is predicated and one that is referred to by a masculine pronoun. This in general produces anomaly, whether the predication of pregnancy involves a relative clause or not:

- (10) @My neighbor<sub>i</sub> is pregnant. He<sub>i</sub> says he<sub>i</sub>'s happy.

The second argument was that without assumption (8b) it would be necessary to do something to prevent the generation of sentences like (11):

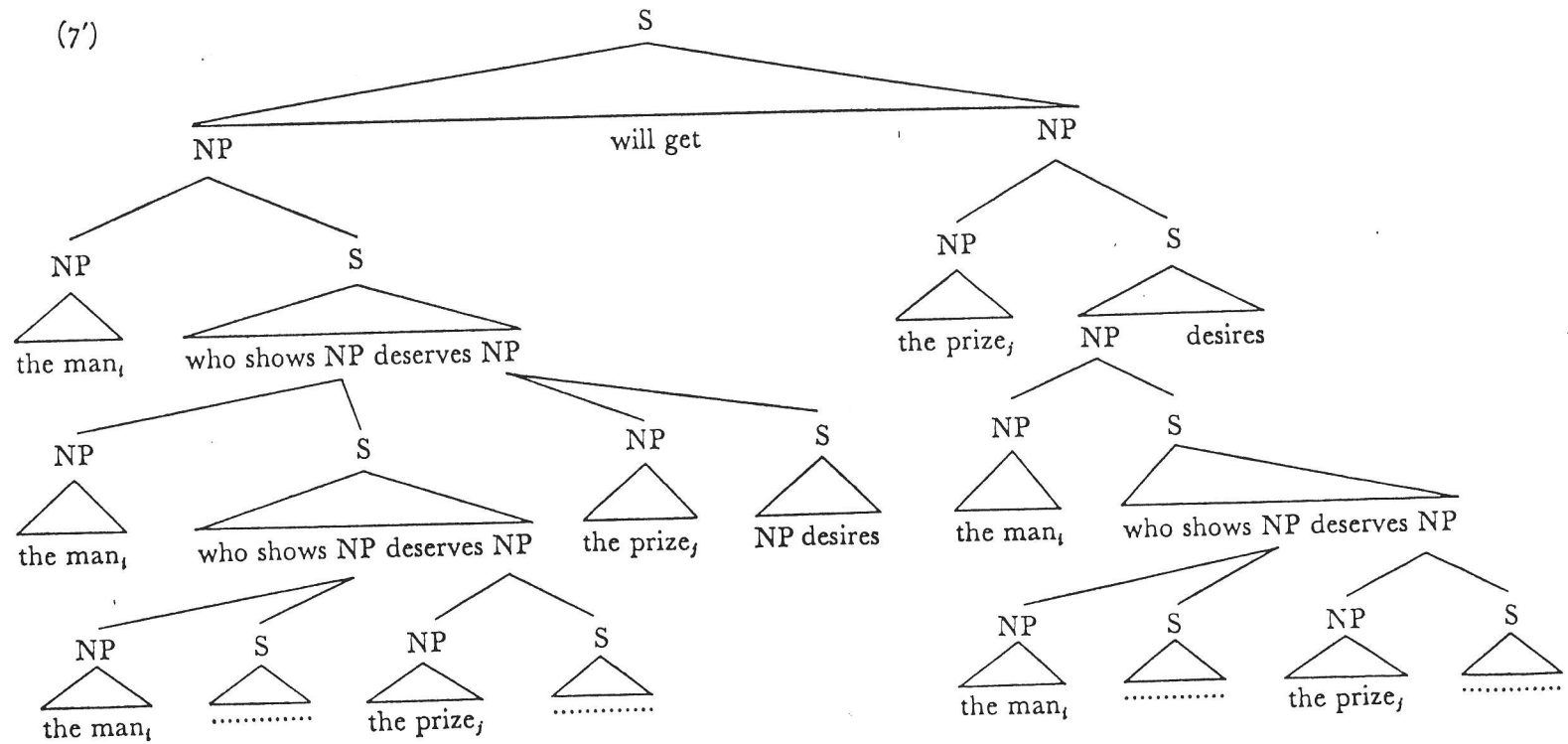
- (11) \*The man<sub>i</sub> who lives next door said that he<sub>i</sub> who lives next door would mow my lawn during vacation.

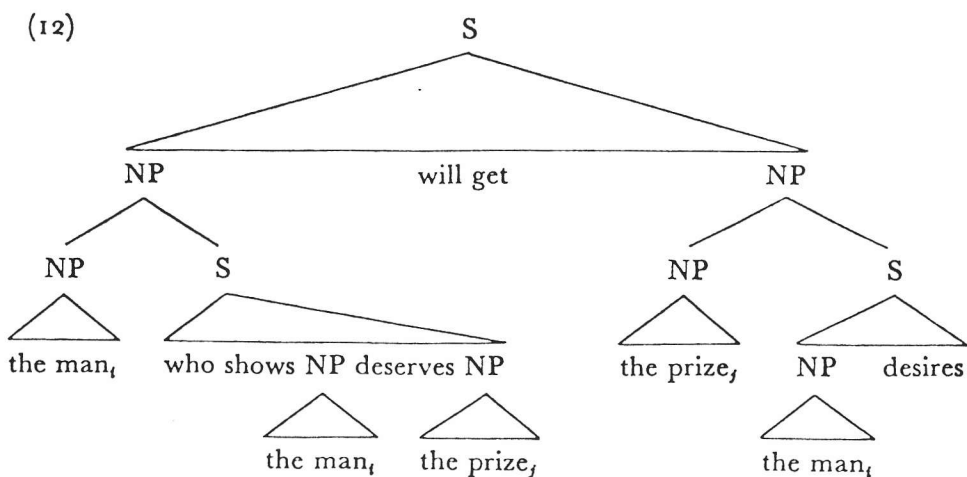
He does not, however, say how (11) is to be prevented under the assumption that pronouns are base-generated in NP positions. Some constraint will have to be formulated in any case that prevents an anaphoric pronoun from being generated as the head of a relative clause, and this appears to be an exact analogue of the constraint that would be needed in a transformational theory to prevent pronominalization of the head of a relative clause.

The consequence of all this is that there is no reason why the source of (7) cannot simply be the underlying structure shown in (12) on page 432.<sup>9</sup> Consequently, even if one follows Bach in rejecting infinite deep structures, the argument against a transformational rule of pronominalization is not valid, because its second premise is also unsupported.

<sup>9</sup> Bach's original (unpublished) paper apparently did not contain arguments to support assumption (8b), and more than one critic (e.g. Chomsky, reported in Dougherty (1969)) pointed out that this alternative evades the infinite structures problem.

(7')





1.1.2.2. Bresnan's Argument. A second argument, due to Bresnan (1970), is more instructive, though still inconclusive as an argument against the transformational derivation of pronouns.

In the original (and most naïve) version of the classical theory, it was assumed that definite pronominalization converted full NPs into definite pronouns under both referential and morphological identity with an antecedent. Thus a sentence like (13) has a source represented in (14):

(13) Some students<sub>i</sub> think they<sub>i</sub> are smarter than they<sub>i</sub> are.

(14) [\*]Some students<sub>i</sub> think some students<sub>i</sub> are smarter than some students<sub>i</sub> are.

The fact that pronominalization is obligatory then accounts for the ungrammaticality of (14), with indicated coreference.

Against this theory, Bresnan argues that sentence (15) cannot be derived by a rule of pronominalization because it would have a source like (16):

(15) Some students<sub>i</sub> believe that they<sub>i</sub> are running the show.

(16) [\*]Some students<sub>i</sub> believe that some students<sub>i</sub> are running the show.

In this instance, nothing would stop *There* Insertion from applying in the embedded clause (before pronominalization would have a chance, since *There* Insertion is cyclic) to produce (17):

(17) [\*]Some students<sub>i</sub> believe that there are some students<sub>i</sub> running the show.

Subsequent pronominalization would yield the ungrammatical (18):

(18) \*Some students<sub>i</sub> believe that there are they<sub>i</sub> running the show.

Bresnan concludes that the pronoun *they* should appear in deep structure. Notice, however, that such Ss argue only that a syntactic rule of pronominalization could not

introduce definiteness. It is possible to construct a transformational theory of pronominalization according to which the source of (15) is not (16) but (19):

(19) [\*]Some students<sub>i</sub> believe that the students<sub>i</sub> are running the show.

Here, the conversion of *the students<sub>i</sub>* into the pronoun *they* does *not* require identity of determiner between the controller NP and the target NP. Note that (19) as it stands is ungrammatical, with the indicated coreference. The fact that pronominalization is obligatory would account for this.

As for the ungrammaticality of (16), that is accounted for by a principle that must be stated independent of pronominalization: two indefinite NPs in the same discourse always differ in their intended reference. The following contrast demonstrates this principle:

(20) \*A woman<sub>i</sub> stepped into the car. A woman<sub>i</sub> was carrying a briefcase.

(21) A woman<sub>i</sub> stepped into the car. The woman<sub>i</sub> was carrying a briefcase.

(21) shows (as is well known) that pronominalization is not obligatory across sentence boundaries; (20) shows that the prohibition on coreferential indefinite NPs holds across sentence boundaries and consequently cannot be accounted for by obligatory pronominalization anyway.

In conclusion, Bresnan's argument does not show that pronouns are not introduced transformationally. Rather, she has shown that definiteness is underlyingly present in NPs, and that (if it is a transformation) definite pronominalization must operate to convert underlyingly definite NPs into definite pronouns, when they are coreferential with but not necessarily completely morphologically identical to an appropriate antecedent.<sup>10</sup>

<sup>10</sup> Bresnan's argument is typical of a whole class of arguments that can be (and have been) brought forth against any theory that attempts to convert NPs containing quantifiers into pronouns. Sentences like (i)–(iii) have readings that do not correspond to their presumed sources ((iv)–(vi)):

- (i) All Italians<sub>i</sub> think they<sub>i</sub> are handsome.
- (ii) Every Italian<sub>i</sub> thinks he<sub>i</sub> is handsome.
- (iii) Any Italian<sub>i</sub> would die for his<sub>i</sub> mother.
- (iv) All Italians<sub>i</sub> think all Italians<sub>i</sub> are handsome.
- (v) Every Italian<sub>i</sub> thinks every Italian<sub>i</sub> is handsome.
- (vi) Any Italian<sub>i</sub> would die for any Italian<sub>i</sub>'s mother.

The differences can be brought out in various syntactic ways; for example:

- (vii) Every Italian<sub>i</sub> thinks that he<sub>i</sub> alone is handsome.
- \*Every Italian<sub>i</sub> thinks that every Italian<sub>i</sub> alone is handsome.
- (viii) One girl<sub>i</sub> claimed that she<sub>i</sub> herself could read Homer.
- \*One girl<sub>i</sub> claimed that one girl<sub>i</sub> herself could read Homer.

Though there is little agreement about the appropriate representation of this fact, it is clear that indefinite determiners like *some* in Bresnan's examples are semantically existential quantifiers, and that the more general problem requires a solution that keeps quantifiers out of the picture when antecedent–anaphor relations are being determined. Note that an interpretive approach to pronoun–antecedent relations must also be designed so as not to give the pronouns in examples like (i)–(iii) readings corresponding to “all Italians”, “every Italian”, “any Italian”.

1.1.2.3. *Kayne's Argument.* Kayne (1971) gives an ingenious argument against the strict transformational position based on the behavior of clitic pronouns in French. Reduced to essentials, the argument is as follows:

- (22) a. Clitic movement operates only on pronouns; hence, if there is a transformational rule of pronominalization converting full NPs to pronouns, it must precede cliticization.
- b. There are cases, however, where clitic movement should then be able to move a pronoun to the left of its antecedent, but the resulting sentence is ungrammatical.

Fact (b) indicates that Clitic Movement crucially affects precede-command relations before application of BAC, and consequently the transformational position would require that pronominalization *follow* Cliticization. The resulting ordering paradox can be avoided only by assuming that pronouns are present underlyingly (or at least introduced before Clitic Movement), with the well-formedness of pronoun-antecedent pairs determined according to the BAC subsequent to Clitic Movement.

The facts appear to present no problem for an interpretive approach like the one outlined for definite pronouns in section 1.1(b) above: if the pronouns are present underlyingly, Cliticization can operate on them; but if a pronoun ends up preceding and commanding some NP, the interpretation rule (which operates subject to the BAC) cannot interpret it as coreferential with that NP.<sup>11,12</sup>

It should be noted, however, that Kayne's argument supports only the underlying presence of pronouns, as opposed to a theory deriving them by a superficial transformation operating subject to the BAC; it does not directly support the theory that they are superficially interpreted. In fact, all that it directly shows is that whether or not pronouns are created by a transformation, the BAC must be stated as a separate condition taking effect after clitic movement; it cannot be stated as a condition on the creation of the anaphors.

<sup>11</sup> In his squib, Kayne suggests an analysis essentially identical to the one that we will show to be generally necessary for deep anaphora: coreference marking of pronouns with antecedents in deep structure, with the BAC acting as a filter at a superficial level. Kayne does not argue for this proposal as opposed to the interpretive approach.

<sup>12</sup> Kayne's argument bears on yet a third theory of definite pronominal anaphora, one we have so far not discussed because it does not figure in any proposed comprehensive theory of anaphora. This is the proposal of McCawley (1970) that pronouns are inserted for bound variables in underlying representations that happen not to be filled by a regular NP as a result of his NP lowering rule.

As McCawley formulates this theory, the underlying structures have neither full NPs nor pronouns in the places where these constituents will eventually turn up in surface structures; there are only variables there, indexed to NPs somewhere outside the clause. Movement rules apply to the clause structures with variables in place, and only after all rearrangements are made are the full NPs lowered into place, subject to the BAC so that no NP is lowered into a position where it will be both preceded and commanded by another instance of its own index. Then the leftover variables are converted to pronouns.

This theory claims explicitly that no movement rules are sensitive to the difference between pronouns and full NPs. Consequently, any clitic movement rule, such as the one Kayne cites for French, counterexamples it. See Wasow (1975) for some discussion of variable binding theories for definite pronouns, and for consequences of the fact that they do not distinguish full NPs from pronouns at early stages of derivations.

1.1.2.4. *Bresnan's Other Argument.* Virtually all of the arguments directed against the strict transformational position have been designed to show that definite pronouns are present in underlying structure. We will conclude (on the basis of evidence to be presented later in this article) that the transformational approach is untenable. We preview this evidence in the one argument we know of that has been previously advanced against the strict transformational theory which is not directed against simple NP pronouns.

Bresnan (1971) notes that the missing antecedent phenomenon that Grinder and Postal (1971) brought forth as an argument for the transformational nature of Verb Phrase Deletion (this argument is reviewed in section 2.1) is not observed in the case of sentential *it* and *do it* anaphora (this is reviewed in section 2.2). She points out that this is exactly what would be expected if such anaphors were present in underlying structure and not derived from fully expanded ancestor forms by a transformation.

This argument appears to be impeccable, and, as will be clear from what follows, the observation on which it is based serves as the starting point for our investigation.

1.1.2.5. *Summary.* In response to the early arguments (particularly Bach's) against syntactic pronominalization, an interpretive approach was formulated (cf. Jackendoff (1968), Dougherty (1969)) for definite pronouns; this approach has been subsequently generalized by some (e.g. Jackendoff (1972), Wasow (1972)) to all anaphora.

It should be noted that the interpretive approach to anaphora as it has been developed in the works cited incorporates two independent assumptions, which have not generally been carefully distinguished from one another: first, that pronouns (and anaphors in general, in the original strict interpretive theory) are present in underlying structure, and not derived (by deletion or replacement) from underlying full NPs; and second, that coreference is not marked in underlying representations, but rather is supplied by an interpretive rule operating at a superficial level of structure. To the extent that they are valid, the arguments reviewed above show that for some anaphors at least the first assumption is correct. This result is in contrast to the exactly opposite conclusion that was reached in the case of certain other anaphors in the preceding section.

So far as we know, there are no arguments in previous literature in favor of the second assumption of interpretive theory, for any class of anaphors. In later sections of this article we will return to the question of the level at which anaphors are assigned interpretations, and argue that no anaphors receive their interpretations by interpretive rules operating at superficial levels. In the subsequent part of the present section, however, we will restrict our attention to the properly syntactic aspect of theories of anaphora, namely the question of origin and syntactic history of anaphors. Having seen that both monolithic positions must be rejected, we proceed to consider various mixed theories.



### 1.2. *Mixed Theories*

The extreme positions ((a) and (b) in section 1.1) are by no means the only conceivable positions on the nature of anaphora. Here we will sketch two intermediate positions that have been proposed.

#### *The Deep Pronoun Hypothesis*

One intermediate position, taken by Akmajian (1970) and argued for in Bresnan (1971), is that "pronouns" (nonnull anaphors) are underlyingly present and interpreted at some stage as being anaphorically related to a particular antecedent, while null anaphors result from transformational deletion processes.

#### *The ISD (Identity of Sense Deletion) Hypothesis*

Grinder and Postal (1971) advance the claim that all identity of sense anaphors arise by deletion, leaving open the possibility (by saying nothing about it) that Identity of Reference Anaphora (IRA) involves underlyingly present pro-forms. This is the position argued against in Bresnan (1971), on the grounds that ISA do not behave uniformly with respect to the missing antecedent test.

Both of these intermediate theories agree that ISA with null anaphors is transformational (by deletion), and that IRA with nonnull anaphors is nontransformational (the anaphoric relation being assigned interpretively). They disagree on the nature of ISA with nonnull anaphors. Regarding the last case, we have Bresnan's argument that the ISD hypothesis is wrong.

In this article, we will argue that both of the proposed intermediate positions are wrong. In section 4.1 we will show that there is a case of ISA with null anaphor that is nontransformational, which falsifies both theories at once.

### 1.3. *Postal's Argument Against Mixed Theories and Our Conclusion*

In his reply to Bresnan (1971), Postal (1972) objects to any "mixed" approach to anaphora on the grounds that (a) it has long been known that anaphoric processes of all kinds are subject to the same constraints on backwards anaphora (here referred to by the blanket term Backwards Anaphora Constraint); (b) if anaphoric processes are represented by two entirely different formal devices, then it will be impossible to state the BAC in a unified fashion for all cases to which it applies.

He concludes from this, since he takes the evidence for a deletion analysis in some cases to be decisive, that all anaphoric processes involve deletion (at a superficial stage); thus he adopts the strict transformational position.

Arguing in similar fashion, Wasow (1972) adopts the strict interpretive position in modified form, since he takes the arguments for deep pronouns in certain cases to be decisive.

A careful evaluation of the arguments presented above, together with the results of the investigation presented subsequently in this article, leads us to a different conclusion. The evidence for the existence of two fundamentally different types of anaphoric processes appears to be inescapable, and we must therefore reject Postal's premise that the only way to state the BAC in uniform fashion for all anaphora is to state it as a condition on the application of the rule creating the anaphoric relation. We will return to this question in section 6.2.2 and discuss the nature of the BAC in some detail. We will argue that it must be formulated so that its application is independent of the mode of derivation of the anaphor.

We will develop at the end of this article a comprehensive theory of anaphora that divides anaphoric processes into two types: deep anaphora and surface anaphora. Our theory is consequently a "mixed" theory, like the two discussed immediately above. However, we do not attempt to classify a particular anaphoric process either on the basis of some superficial syntactic characteristic (such as whether the anaphor is null or not) or on the basis of a semantic characteristic such as the ISA/IRA distinction. What we do find is that whether or not an anaphor is transformationally derived (so far as we can tell) correlates exactly with a pragmatic distinction—the ability of the anaphor to be interpreted under pragmatic control.

## 2. Deletion Anaphora and Deep Anaphora

We now turn to the contrast observed in section 0.1 and show that there is a correlation between the ability of an anaphoric process to operate under pragmatic control and the existence of evidence that it involves deletion.

### 2.1. *VP Deletion*

On the basis of sentences like (23)–(24), Grinder and Postal (1971) have argued that VP anaphora of the type exhibited must involve a syntactic deletion rule, relating intermediate structures like (23a) and (24a) to surface structures like (23b) and (24b):

- (23) a. I've never ridden a camel, but Ivan's ridden a camel<sub>i</sub>, and he says it<sub>i</sub> stank horribly.
- b. I've never ridden a camel, but Ivan has, and he says it<sub>i</sub> stank horribly.
- (24) a. I don't keep gerbils in my office, Judy keeps gerbils<sub>i</sub> in her office, and they<sub>i</sub> eat holes in her books.
- b. I don't keep gerbils in my office, Judy does, and they<sub>i</sub> eat holes in her books.

The essence of their argument is that the right clauses of these sentences contain a pronoun that must have an antecedent, but the surface structures of the (b) sentences contain no NP that could be the antecedent for the pronoun. Note that the

instance of the NP *a camel* in the left clause of (23b) cannot serve as antecedent for a definite pronoun:

- (25) \*I've never ridden a camel, and it stank horribly.<sup>13</sup>

On the basis of this "missing antecedent" phenomenon, Grinder and Postal argue that an interpretive theory of VP anaphora (and, they claim, *any* identity-of-sense anaphora) that attempts to generate the structures containing null anaphors directly, without deriving them from an intermediate stage at which the anaphoric VP is syntactically represented, must be rejected.

Ross (1969) also gives several arguments that VP Deletion is a syntactic deletion process. In sentences like (26), if the anaphoric right clause is derived by a rule deleting a segment under identity with a segment in the left clause, the appearance of the distributionally restricted item *there* and the plural agreement are straightforwardly accounted for; if such truncated clauses are assumed to be generated directly by special phrase structure rules, some unpleasantly ad hoc mechanisms will have to be called into play.

- (26) We can't prove that there are such rules, but there  $\left\{ \begin{array}{l} \text{are} \\ *is \end{array} \right\}$ .

In sentences like (27)–(28), the collocation WH + *to* and the observed restriction that the WH cannot be *why* in this collocation are accounted for directly under an analysis that derives such sentences by a combination of WH Fronting and VP Deletion, since the predeletion versions exhibit exactly the same collocation and restriction.

- (27) He knows how to fly, but I don't know how to.  
 (28) \*He knows how to fly, but he doesn't know why to.

Finally, an otherwise reducible auxiliary fails to undergo reduction before the null segment:

- (29) Paul Anderson's fat, and  $\left\{ \begin{array}{l} \text{I am} \\ *I'm \end{array} \right\}$  too.

This inability of normally reducible items to reduce has been shown (King (1970)) to correlate with the presence of an immediately following deletion (or extraction) site.<sup>14</sup>

<sup>13</sup> The *it*, of course, may have another antecedent in discourse; then (11) is grammatical:

(i) Al, why did you refuse to ride the camel<sub>i</sub>?

Al: I've never ridden a camel, and it<sub>i</sub> stank horribly.

Sentences like (23b) and (24b), however, are grammatical even in the absence of a discourse or pragmatic antecedent for the pronoun.

<sup>14</sup> Actually, this particular argument only shows that the null VP anaphora produce an effect that is also caused by processes generally regarded as involving deletion. It is consequently an argument only against those theories that would claim that the position immediately following the Aux in (29) is in no way represented as similar to a deletion site (or to whatever, according to a particular theory, represents those places where reduc-

The arguments of Ross and Grinder and Postal show clearly that where there is a null segment in place of VP on the surface, the sentence must at some stage have a representation in which the missing material is syntactically present.<sup>15</sup> The evidence further indicates that the anaphoric process involved is quite superficial in nature. The null anaphor represents, in surface structure, whatever material can appear to the right of Aux; as examples like (26) show, the stage at which the well-formedness of the omission is determined is a superficial one.

## 2.2. *Do It*

Bresnan (1971) has shown that the missing antecedent arguments cannot be constructed to show that *do it* anaphora is a deletion process:

- (30) \*Jack didn't cut Betty with a knife—Bill did it, and *it* was rusty. [*it* = the knife Bill cut Betty with]

The judgments are delicate, but there is generally agreed to be a difference between this sentence and the corresponding one with VP Deletion, which allows control of *it* from the missing antecedent.

In fact, Bresnan<sup>16</sup> shows that in general sentential *it* anaphora (of which she

tion cannot occur). Most interpretive theories would assume that the post-Aux position is occupied in surface structure by an empty node, which is to be interpreted under control from a filled node elsewhere in the structure; under such a theory it is only necessary to say that reduction is blocked when there is an immediately following empty node. The argument does show that, at least at some stage, there is more structure to the string than is phonologically realized.

<sup>15</sup> Wasow (1972) proposes an "interpretive" theory that is specifically designed to evade these arguments. He proposes that anaphoric or elliptical structures start out as syntactically fully developed underlying structures, except that some of the nodes are not "filled" with lexical items. It is assumed that all syntactic features of these structures are represented, but that for some nodes lexical insertion does not apply, leaving these nodes empty of phonological or semantic content.

The partially empty structures are then subject to all of the ordinary transformational operations, and at a superficial stage interpretive rules apply, interpreting the empty parts by reference to other parts of the derived structure. These interpretive rules of anaphora (corresponding exactly to the deletion rules in a standard theory) collectively perform a filtering function, since any sentence that is not "interpretable" by one or several of them is rejected. This eliminates all of the unacceptable structures that are the inevitable result of optional lexical insertion.

We will not discuss the details of making this work; syntactically, it is at best a notational variant of the deletion theory. Saying that lexical insertion is optional is equivalent to saying that there is an option of free deletion that may erase the contents of any lexical node anywhere; if there are items inserted by transformations, this theory must incorporate some device to have these too optionally vacant phonologically, again equivalent to saying that there is free (unconstrained) deletion. The syntactic effect of the interpretive anaphora rules is then to distinguish the well-formed elliptical structures (those that conform to the structural descriptions of the rules) from the ill-formed ones, which is to say that, of the conceivable deletions, they specify which ones are permissible in fact. In short, they do (at best) exactly what the deletion rules do, as far as syntax is concerned.

As for the semantic effect of these rules, Wasow leaves it to the reader to figure out how they might work, and so do we.

<sup>16</sup> Postal (1972) disputes the generality of Bresnan's observation, claiming that there are cases of sentential *it* containing missing antecedents. The delicacy of the judgments involved makes it very difficult to evaluate the arguments in this controversy, but the fact remains that there is a difference between VP Deletion, which readily allows missing antecedent effects for all speakers, and sentential *it* (including *do it*) anaphora, which in general do not. It is this difference that we are interested in.

assumes, probably correctly, that *do it* is a special case) fails to exhibit the missing antecedent phenomenon:

- (31) \*Jack didn't get picked off by a throw to first, but it happened to Bill, and *it* singed his ear. [*it* = the throw to first that singed Bill's ear]

She suggests that the correct generalization should be that anaphoric processes that leave pro-forms behind do not exhibit the missing antecedent phenomenon, whereas anaphoric processes that leave no pro-form do.<sup>17</sup>

Notice that Ross's arguments that VP Deletion is a syntactic deletion process do not obtain for *do it* anaphora: there are no *there*-insertion sentences anaphorized with *do it*; there is no argument on the basis of the *how to*/\**why to* contrast, since *do it* is manifestly a VP in its own right and can take the relevant adverbial modifiers (*do it this way*, *do it for this reason*); and there is no argument based on the reduction prohibition. It appears that we can accept Bresnan's conclusion that *do it* and sentential *it* are deep pro-forms, not derived by deletion.

### 2.3. *Superficial Syntactic Deletion and Syntactic Control*

We have noted that there is a correlation, for the VP anaphora rules, between the existence of evidence that the rule is a syntactic deletion and its inability to operate under pragmatic control. We advance the following general claim:

#### *Claim*

It is just those anaphoric processes that involve syntactic deletion at a superficial level of structure that require syntactic control.

We thus distinguish "deletion" anaphora, which is distinguished by evidence that the anaphor, even if null on the surface, has at some stage a representation with internal syntactic structure, from "deep" anaphora, in which the anaphor is a pro-form that gives no sign of having been syntactically complex at any stage. Our claim is that deletion anaphora requires an antecedent in actual linguistic structure, so that "null anaphors" produced by deletion cannot normally be interpreted under pragmatic control; but that in general deep anaphors not derived by deletion may be so controlled.

Thus, for example, as pointed out in the introduction, ordinary definite pronouns do not in general require syntactic control. Our claim will be falsified, then, if evidence is uncovered showing that such pronouns are transformationally derived from full NPs. No such evidence exists, so far as we know. On the other hand, our claim is supported to the extent that there is independent evidence, such as Kayne's argument provided in an earlier section, that definite pronouns are deep anaphors.

<sup>17</sup> In section 4.1, we will discuss an anaphoric process that does not involve a pro-form (i.e., the "anaphor" is null) and which does not exhibit the missing antecedent phenomenon. We will show, however, that this process is not deletion anaphora.

Similarly, sentential *it* pronominalization can also occur with nonsyntactic control, as in the following situation:

- (32) Hankamer [observing Sag successfully ripping a phone book in half]:  
I don't believe it.
- (33) Sag [same circumstance]:  
It's not easy.  
Nominal ISA exhibits similar behavior:
- (34) [Sag produces an apple]  
Hankamer: Did you bring one for me?
- (35) [Observing Max ride by on his camel]  
Did you ever ride on the one Sue used to have?

Nonsyntactic control of indefinite pronouns like *one(s)* seems quite acceptable.

In their article on missing antecedents, Grinder and Postal attempt to argue that *one* anaphors can contain missing antecedents. Their examples are:

- (36) a. Harry sank a boat carrying a gorilla<sub>i</sub> and George sank a boat carrying a gorilla<sub>j</sub> and they<sub>i,j</sub> both drowned.
- b. Harry sank a boat carrying a gorilla and George sank one too and they both drowned.
- (37) Max doesn't know a lady who was put in prison but Joe does know one and she is still there.

With regard to (36), we find that the judgment for the (b) example is similar to the (b) example of (38) below, as opposed to the (a) example:

- (38) a. Harry sank a boat carrying a gorilla and George did too, and they both drowned.
- b. \*Harry sank a boat carrying a gorilla and George did it too, and they both drowned. [ungrammatical where *they* = gorillas]

Furthermore, it seems that Grinder and Postal are cheating somewhat by introducing an example in which the pronoun is half-controlled from outside the anaphor. The following example seems worse:

- (39) \*Harry didn't sink a boat carrying a gorilla, but George sank one, and it drowned.

It is rather difficult to avoid reading *it* as referring to the boat.

Their other example, (37), presumably designed to show that *there* can be controlled from inside the anaphor *one*, simply does not make the point. The anaphor *there* can be controlled from the instance of *prison* that is present in the preceding clause, in spite of the negation, as (40) shows:

- (40) Max doesn't know a lady who was put in prison, but he's been there himself.

We conclude that Grinder and Postal were mistaken in their conclusion that the anaphor *one* can contain missing antecedents, and that it is in fact a deep anaphor. This constitutes another counterexample to their claim that all identity of sense anaphors are instances of deletion anaphora.

The claim advanced in this section appears to be borne out so far; in the next section we will examine another anaphoric process which, like Null VP Anaphora, can be argued to involve deletion, and we will test whether it permits pragmatic control.

#### 2.4. *Sluicing*

Ross (1969b) has presented compelling arguments for the existence of a transformational deletion operation, which he calls *Sluicing*, to derive sentences like (41b) from sources like (41a):

- (41) a. We were looking for somebody, but I can't remember who we were looking for.  
 b. We were looking for somebody, but I can't remember who.

Like the other anaphora rules discussed here, *Sluicing* can be syntactically controlled from previous linguistic context, even with a change of speakers:

- (42) Hankamer: Someone's just been shot.  
 Sag: Yeah, I wonder who.

But it cannot be pragmatically controlled, as the following example demonstrates:

- (43) [Hankamer produces a gun, points it offstage and fires, whereupon a scream is heard]  
 Sag: #Jesus, I wonder who.

Our claim is upheld.

### 3. Ellipsis Rules

In this section we examine the class of rules that effect ellipsis in clauses. These are the rules that delete constituents from variable locations in a clause under identity with corresponding constituents in some other clause. Their properties are discussed in Hankamer (1971), and arguments that any rule of this type must be a syntactic deletion are given in Hankamer (1973).<sup>18</sup>

<sup>18</sup> In addition to the arguments given there, it is possible to construct Grinder-Postal type arguments based on the missing antecedent phenomenon for each of these rules. To illustrate, for the rule of Stripping:

(i) Bill took his coat off, but not Sally. She never takes it off.

In this sentence the pronoun *it* can refer to Sally's coat, even though the surface structure contains no NP that could control the anaphora, and the sentence is clearly good in a context where the pronoun could not be pragmatically controlled.



3.1. *Stripping*

Stripping is a rule that deletes everything in a clause under identity with corresponding parts of a preceding clause, except for one constituent (and sometimes a clause-initial adverb or negative):

(44) Alan likes to play volleyball, but not Sandy.

(45) Gwendolyn smokes marijuana, but seldom in her own apartment.

This rule can operate across a speaker boundary. Notice that the two clauses in each of the examples can be uttered by different speakers, and the resulting discourses are well-formed, as the following one is:

(46) Hankamer: Listen, Ivan, he's playing the *William Tell Overture* on the recorder.

Sag: Yeah, but not very well.

(Where the response *not very well* results from the application of Stripping to the full clause *But he isn't playing the William Tell Overture on the recorder very well.*)

This stands in marked contrast to the following discourse, where the extra-linguistic context might be expected to provide sufficient information to pragmatically control Stripping:

(47) [Sag plays *William Tell Overture* on recorder]

Hankamer: #Yeah, but not very well.

The ill-formedness of this discourse shows that Stripping requires syntactic control.<sup>19</sup>

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In order to construct a missing antecedent argument for Gapping, we must consider an idiolect such as that of only one of the authors of this article, in which sentences are accepted that violate the No-Ambiguity Constraint proposed in Hankamer (1973). The crucial property for our purposes is the ability to gap an object NP along with the verb, as in (ii):

(ii) Sally took her clothes to the laundromat, and Herman, to the dry cleaner. [from [. . . and Herman took his clothes to the dry cleaner]]

Speakers who accept (ii) on the intended reading are also happy with (iii), showing that the gap can contain a missing antecedent:

(iii) Sally took her clothes to the laundromat, and Herman, to the dry cleaner, even though they are all wash-and-wear. [where *they* may be interpreted as Herman's clothes]

<sup>19</sup> The possibility of pragmatic control in the following example provides a counterexample to the simple claim made in the text:

(i) Not in my wastebasket, you don't.

We have not the space here to go into the details of this very interesting phenomenon, but it appears that the requirement of syntactic control holds only for strictly declarative sentences, sentences with the illocutionary force of statements. In the case of examples like (i), the illocutionary force is clearly not declarative, but peremptory; and in imperatives and exhortatives VP deletion also can take place under pragmatic control:

(ii) [Hankamer brandishes cleaver, advances on Sag]

Sag: Don't! My God, please don't!

Similarly, if you see that an acquaintance has dyed his hair green, you can say:

(iii) You didn't!

What is clear is that in each of these cases the illocutionary force is not declarative (although what exactly it is in some cases, as in (iii), is far from clear). So far as we have been able to determine, the restriction holds

### 3.2. *Gapping*

Gapping is an ellipsis rule that applies in coordinate structures to delete all but two major constituents from the right conjunct under identity with corresponding parts of the left conjunct:

- (48) Ehrlichman duped Haldeman, and Nixon, Ehrlichman.

Gapping too can operate across a speaker boundary, as is shown by the following discourse:

- (49) Hankamer: Ivan is now going to peel an apple.  
Sag: And Jorge, an orange.

Once again, we observe that although it doesn't matter whose utterance controls Gapping, it nevertheless must be an utterance and not merely a situation. Consider the following discourse:

- (50) [Hankamer produces an orange, proceeds to peel it, and just as Sag produces an apple, says:]  
#And Ivan, an apple.

Clearly, this discourse ranks high on the bizarreness scale. We conclude that Gapping requires syntactic control.

The rule of Gapping can also delete subjects,<sup>20</sup> as in (51):

- (51) Mitchell lied to the committee, and is now serving his sentence.

And, as by now should come as no surprise, subject-Gapping requires syntactic control, as the following discourse shows:

- (52) [Hankamer is still peeling his orange]  
Sag: #And is dropping orange peels all over my foot.

It has been suggested to us that what is wrong with examples like (50) and (52) is perhaps not the lack of syntactic control for Gapping, but the impossibility of interpreting an isolated conjunct beginning with *and*; in other words, that the sentences are independently ungrammatical because *and* can only occur between surface conjuncts. This, however, does not appear to be true, for there are contexts in which utterance-initial *and* is possible, with no preceding discourse:

- (53) [Observing Ivan playing pretty good ragtime piano]  
And he doesn't even have a left hand!

perfectly for declarative sentences. We have no idea why there should be such an effect on the behavior of anaphoric processes conditional upon the illocutionary force of the utterance.

<sup>20</sup> Arguments that such sentences result from Gapping and are not instances of VP Conjunction Reduction are given in Hankamer (1973). Arguments that the rule that derives such sentences must be distinct from Gapping are given in Sag (forthcoming). Note that even if such ellipsis is effected by a distinct rule, the argument made in the text is unimpaired.

Other examples are easily called to mind. It seems that such cases involve essentially pragmatic omission of an understood left conjunct, which is just what would have to be possible to allow the utterance-initial *and* in examples like (50) and (52). And in fact, if we put the verbs back in (and the subject in (52)), the bizarreness disappears:

- (54) [Same context as (50)]  
And Ivan is going to peel an apple.
- (55) [Same context as (52)]  
And he's dropping orange peels all over my foot!

We must conclude that the strangeness of (50) and (52) is not due to the fact that the conjunction is not flanked by conjuncts, but rather to the attempt to gap under pragmatic control.

We have shown in this section that two ellipsis processes, Gapping and Stripping, can be controlled syntactically across a speaker boundary from a discourse antecedent, but cannot be controlled pragmatically. It is impossible to construct examples in which other ellipsis rules (such as Comparative Ellipsis) apply across sentence boundaries at all, so it is impossible to test them for pragmatic control. So far as we have been able to determine, there are no counterexamples to our claim: ellipsis rules that can be shown to involve deletion cannot operate under pragmatic control.

#### 4. Two More Anaphoric Processes

##### 4.1. *Null Complement Anaphora*

An interesting and ill-understood anaphoric process, which we will call *Null Complement Anaphora* (NCA), is illustrated in the following examples:

- (56) a. I asked Bill to leave, but he refused.  
b. Sue was attempting to kiss a gorilla, and Harry didn't approve.  
c. We needed somebody to carry the oats down to the bin, but nobody volunteered.

In each case the understood sentential or VP complement of the verb must be interpreted from context. Shopen (1972) discusses this process at length and shows, in particular, that it can be pragmatically controlled:

- (57) [Indulgent father feeds baby chocolate bar for dinner]  
Mother: I don't approve.
- (58) [Two people are disturbed by loud noises of popcorn-eating in adjacent row]  
One to the other: Don't you think we should complain?

It has been assumed by at least some of the people who have noticed this phenomenon that it is a syntactic deletion process that strips the verb of its complement

under identity with something somewhere else. But in spite of the truncated look of these clauses, there does not appear to be any real syntactic evidence that a deletion has taken place. Because the entire complement is missing, there is nothing left behind to show that any syntactic operations ever took place within a real complement underlying the null complement. Furthermore, there is no evidence that a real complement was ever present to undergo any syntactic rules in the matrix clause; corresponding to the sentences in (59), we have nothing like (60), which would have resulted from the presence of a syntactically active complement undergoing deletion after participating in syntactic activity:<sup>21</sup>

- (59) a. Max agreed.  
       b. Max complied.  
       c. She said it was in the trunk, and I'm afraid somebody overheard.  
 (60) a. \*Was agreed (to?) by Max.  
       b. \*We expected to be complied (with?) (by Max).  
       c. \*She said that it was in the trunk, and I'm afraid was overheard.

This means that the only type of argument known that could serve to show that null complement anaphora was a deletion process would have to be a missing antecedent argument. But in fact the null anaphors in these constructions cannot contain missing antecedents:

- (61) a. He said that one of us had to give up his seat, so Sue volunteered to give up her seat, because it was too narrow for her anyway.  
       b. \*He said that one of us had to give up his seat, so Sue volunteered, because it was too narrow for her anyway.  
 (62) a. I never managed to ride a camel, but Sue succeeded in riding a camel, and it was the two humped variety.  
       b. \*I never managed to ride a camel, but Sue succeeded, and it was the two humped variety.

<sup>21</sup> One might be tempted to say that the observed cases are nothing but intransitive uses of these verbs and that no anaphora is involved. There are two reasons why this cannot be accepted.

First, the interpretation of the null complement is not usually as a general (unspecified) object of the verb; this is in distinct contrast to the behavior of ordinary cases of intransitive use of normally transitive verbs:

(i) I bring him soup and potatoes, but he won't eat.

(i) does not mean that he specifically won't eat soup and potatoes, but rather than he won't eat anything. On the other hand, a sentence like (ii) means specifically that my wife doesn't approve of my playing cards and shooting dice, not that she just doesn't approve of anything in general.

(ii) I play cards and shoot dice, and my wife doesn't approve.

Second, null complement anaphora obeys the backwards anaphora constraint:

(iii) I don't approve of her driving a truck, though she's old enough.  
       Though she's old enough, I don't approve of her driving a truck.  
       Though she's old enough to drive a truck, I don't approve.  
       \*I don't approve, though she's old enough to drive a truck.

If NCA is not considered to be anaphora, we would need a new notion, *anaphora prime*, to encompass anaphora

The (b) sentences should be compared with the corresponding VP Deletion sentences, which do allow missing antecedents:

- (63) a. He said that one of us had to give up his seat, so Sue did, because it was too narrow for her anyway.  
 b. I never managed to ride a camel, but Sue did, and it was the two humped variety.

Missing antecedent judgments are admittedly delicate, but it seems clear that null complement anaphora, for people who are sensitive to the distinction, patterns with noncontainers like *do it* as opposed to containers like VP Deletion.

So it appears that there is no syntactic evidence that null complement anaphora is a deletion process. Notice also that, in contrast to all known cases of deletion anaphora, null complement anaphora does not require that the syntactic antecedent (when there is one) be structurally identical to the form that the anaphorized complement would have taken were it present:

- (64) Nobody else would take the oats down to the bin,  
 a. so Bill did.  
 b. so Bill did it.  
 c. so Bill volunteered.  
 (65) The oats had to be taken down to the bin,  
 a. \*so Bill did.  
 b. so Bill did it.  
 c. so Bill volunteered.

Here we see that VP Deletion, which has been shown to be an instance of deletion anaphora, cannot apply when the deleted VP would have been nonidentical to the surface form of the controlling VP. But in (65c) the complement VP, if present, would have had to be *to take the oats down to the bin*, and this is nonidentical to the surface form of the controller. So in this respect null complement anaphora behaves like deep anaphora, exemplified by *do it* in the examples above, and not like deletion anaphora.<sup>22</sup>

We must conclude that null complement anaphora is not an instance of deletion anaphora, but rather behaves entirely like a case of deep anaphora (being strange

plus whatever this is, in order to characterize the class of cases to which the BAC applies. For the reader who does not want to recognize NCA as anaphora, it is anaphora prime that we are concerned with in this article.

<sup>22</sup> The lack of need for identity between the would-be surface form of an anaphorized constituent and that of its syntactic controller is in fact a general property of the class of rules we have been calling deep anaphora. Noticing this property of Sentential *it* Anaphora, Lakoff (1968) took it to be an argument that the rule of S-Pronominalization was precyclic:

(i) Sue appears to be thought by everyone to be pregnant, but I don't believe it.

Since only at a precyclic stage is there a syntactically coherent antecedent for the anaphorized S, he concluded that the substitution of *it* for the S-complement of *believe* must have taken place precyclically. This is of course tantamount to saying that the *it* is present underlyingly, since precyclic substitution of *it* for an underlying clause precludes the possibility of showing that the clause was ever there.

only in that it fails to leave behind any overt pro-constituent).<sup>23</sup> Given this, we can explain the contrasts exhibited by the following discourses:

- (66) [Observing Hankamer attempting to stuff 12" ball through 6" hoop]  
 a. Sag: I don't see why you even try.  
 b. #I don't see why you even try to.  
 (67) a. Hankamer: Because I'm convinced that I'll succeed.  
 b. #Because I'm convinced that I'll be able to.

The pragmatic environment allows null complement anaphora, but not VP Deletion.<sup>24</sup> If there is syntactic context, both types of anaphora are possible:

- (68) Sag: Why don't you stuff that ball through that hoop?  
 Hankamer: I'm trying.  
 I'm trying to.

Since null complement anaphora shows no evidence of resulting from a syntactic

<sup>23</sup> It is instructive to contrast the properties of Super-Equi, a rule first proposed by Grinder (1970) to account for the null anaphor in (i):

(i) Harry thought that  $\phi$  washing himself would be a good idea.

Super-Equi is apparently a case of surface anaphora. The rule operates only to anaphorize subjects, and the target may be a derived subject:

(ii) Harry thought that  $\phi$  being kissed by Betty would be nice.

If it were a case of deep anaphora like NCA, we would not expect Passive to be possible (cf. example (60) in the text). We consequently expect Super-Equi to resist pragmatic control.

Clements (1974) cites the following examples showing that Super-Equi does not require a controller in the same sentence:

(iii) a. Giving myself a promotion would anger the press.  
 b. Helping yourself to seconds would shock the hostess.  
 c. Perjuring himself would be politically unwise.

He takes these examples to indicate that Super-Equi does not require a linguistic antecedent. Note, however, that while (iiia,b) can occur in discourse without a linguistic antecedent, (iiic) is impossible unless the prospective perjurer has been mentioned in previous discourse (and many people do not accept it even then). The special status of first and second person pronouns is interesting, but hardly surprising. Third person Super-Equi targets are pragmatically uncontrollable, just as our theory predicts.

<sup>24</sup> There is an interesting contrast between the null complement in these cases and nonnull deep anaphors such as sentential *it* and *do it*. The latter, even when themselves pragmatically controlled, can control deletion anaphora:

(i) [Sag makes as if to hack off left hand again]  
 Hankamer: Don't worry, he never actually does it.  
 (ii) —At least he never has yet.

The null anaphor in (ii), an instance of VP Deletion, can be controlled by the *do it* in (i), which itself is pragmatically controlled.

The null complements discussed in this section, however, cannot serve as antecedents for a syntactic deletion: (67b) is bad even in a discourse where it is preceded by (66a).

Under a theory like the one developed in this article, this is exactly what is expected. In cases like (i)–(ii), there is a syntactically present antecedent, the identity condition for VP Deletion is met (presumably what is deleted is an instance of the deep anaphor *do it*), and VP Deletion can apply. In cases like (66a)–(67b), however, the antecedent is null, and there is no way for the identity condition to be met because *be able to* does not take a deep null complement.

Once again an interpretive approach to the VP Deletion process would have to refer to syntactic properties of the antecedent structure, betraying its essentially syntactic nature.

deletion process, the fact that it is subject to pragmatic control is in accord with our hypothesis. What is interesting for the general theory of anaphora is that there is no superficial sign that reliably distinguishes deletion anaphora from nondeletion anaphora,<sup>25</sup> such as the presence of a pro-form.

#### 4.2. *So Anaphora*

In this section we will discuss briefly one more set of anaphoric processes that have heretofore been ignored, namely cases of sentential and VP anaphora that involve the form *so*:

- (69) Is the moon out? —I believe *so*.  
               —*So* it seems.
- (70) If you have not yet changed your socks, please *do so* immediately.
- (71) They told us she could float, and *so* she can.  
       Look, John, your boat is sinking. —Why, *so* it is.
- (72) I can float, and *so* can she.  
       Paul Anderson's fat, and *so* am I.

It has been assumed (e.g. by Ross (1972)), on the basis of sentences like (69), where *so* appears to replace the sentential complement of *believe* or *seem*, that *so* is a pro-S. Ross argues from this assumption that *do* as in (70) and modals as in (71) have sentential complements. In fact this anaphoric *so* exhibits no hint of S-like or NP-like behavior, and we will see that examples (70)–(72) exemplify three distinct constructions with different properties. It is not clear that we can draw any conclusions about *so* except that it is an anaphoric flag that turns up in certain constructions when an S or VP disappears. Whatever it is, we will argue in this section that *so*-anaphora is deletion anaphora.

We can immediately distinguish the case exemplified in (72) as being semantically distinct from the others. The *so* in (72) appears to be a form of *too/also* that occurs fronted and occasions subject-auxiliary inversion. The sentences of (72) have exact paraphrases with postverbal *too/also*:

- (73) I can float, and she can also.  
       Paul Anderson's fat, and I am too.

Furthermore, this particular *so* is in complementary distribution with *too/also*, whereas

<sup>25</sup> We have no argument, of course, against a vacuous deletion theory, which would say that all anaphora arises by deletion, but whereas what we have been calling deletion anaphora happens very late in derivations (following all cyclic rules in the anaphorized and controlling clauses), the behavior of null complements as well as that of other nondeletion anaphora could be ascribed to deletion processes that take place very early, i.e. precyclically. This move would have the effect of eliminating the possibility of there being any evidence for the deletion operation, which is what is desired since there is none. The only point of real interest is that the two kinds of anaphoric process must be distinguished from one another.



the *so* in (69) and (70) can coexist with *too* (and with *also*, though it sounds a little worse):

- (74) \*I can float and so can she too.  
       \*Paul Anderson's fat, and so am I also.  
 (75) They all changed their socks, and I did so too.  
       I thought he was wrong, and Sue thought so also.

The semantic function of the VP adverb *too/also* is to emphasize the fact that the same thing is being predicated of the subject of the second conjunct as was predicated of the subject of the first. Dummy subjects like *it* and *there* never have anything predicated of them, so they cannot appear in this construction, though they can appear in the construction exemplified in (71):

- (76) They said there would be plenty of beer, and so there was.  
       We were told it would rain, and so it did.  
 (77) \*[any context] . . . and so was there.  
       \* . . . and so did it.

We propose that *so* in examples like (72), where the *so* appears in initial position and subject-aux inversion has taken place, is a realization of the adverb *too/also*, the fronting of which triggers inversion as well as the realization of the adverb as *so*. The anaphora involved is in all other respects exactly like VP Deletion, and we assume that this rule has also applied in sentences like (72).<sup>26</sup>

In spite of the fact that *so* in this construction replaces an adverbial element like *too/also*, in most dialects *So* Fronting cannot occur (and *so* cannot appear) unless the VP disappears (presumably by VP Deletion):

- (78) \*I can float and so can she float.

The appearance of *so* is contingent on the disappearance of the VP, yet it cannot be said to replace the VP.

We have seen that the construction of (72) must be distinguished semantically from all the others. Syntactically, in addition to the differences already cited, *So* Fronting is optional in (72) and (69), obligatory in (71), and impossible in (70); it occasions inversion in (72), but not in (71) or (69). And though no striking semantic difference is visible between the *so*'s in (69)–(71), the context in which *so* appears is different in each case: in (69) it is associated with a genuine verb that has lost its sentential complement, in (70) it goes with a dummy verb (but a full-fledged verb

<sup>26</sup> The *So* Fronting rule, like other adverb-fronting rules that trigger inversion, is a root transformation; it can only apply in immediate discourse consequents of the controlling sentence, or in right conjuncts of a coordinate structure, controlled by the left conjunct. Thus the following examples are ungrammatical:

- (i) \*I can float, and the fact that so can Martha is very comforting.  
 (ii) \*My pig is fat.—I'll grant that, but I'm sure that Bill will have the audacity to claim that so is his.

This accounts for the fact that this kind of *so*-anaphora cannot, as VP Deletion alone can, appear an unbounded variable away from its controller.

- (81) He told me there were speckles on my muffin, and so there were.

Here the presence of *there* and the agreement indicate syntactic presence of the anaphorized matter.

Such direct evidence is not available, so far as we know, for the other two constructions; but examples can be found for all of the *so* constructions in which the anaphor contains a missing antecedent:

- (82) Ivan, have you ever ridden a camel?  
—I believe you might say so—at least I sat on its back while it walked.
- (83) I didn't ride a camel, but Ivan must have done so, and now our office is infested with its fleas.
- (84) We expected her to be accompanied by a dog, and so she was. It was a Weimaraner.
- (85) I washed my monkey with laundry detergent, and so did Bill, but it was so dirty he couldn't get it clean. [Good on a reading where *it* = Bill's monkey]

So in spite of the fact that there seem to be four distinct constructions with somewhat different properties, it appears that all instances of *so*-anaphora are instances of the kind of syntactic process that we have been calling deletion anaphora.

In accordance with the central claim of this article, all forms of *so*-anaphora are strictly syntactically controlled. Substitution of a *so*-anaphoric form into any of the pragmatic contexts that were seen to allow sentential *it* anaphora results in quite striking incongruity:

- (86) [Hankamer again attempting to pass 12" ball through 6" hoop]  
Sag: #I don't think you can do so.
- (87) [Sag succeeds in ripping phone book in half]  
Hankamer: #I don't believe so.
- (88) [Sag plays *William Tell Overture* on recorder]  
Hankamer: #And so can I.
- (89) [Hankamer plays *William Tell Overture* on recorder]  
Sag: #And so he did.

## 5. More Evidence for the Superficial Syntactic Nature of Deletion Anaphora and the Deep Nature of Deep Anaphora

We have shown that it is necessary to distinguish between two classes of anaphoric processes: deletion anaphora, which allows missing antecedents, generally gives other evidence of syntactic dependence on intermediate and superficial structures, and cannot be pragmatically controlled; and nondeletion anaphora, which does not allow

missing antecedents, gives no indication that the anaphorized constituent was ever syntactically present, and can be pragmatically controlled. In this section we examine another aspect of the contrast between these two classes of rules; once again the deletion anaphora rules will be shown to be controlled by superficial syntactic identity, whereas the nondeletion anaphora processes are sensitive to the coherence of semantic units that are not directly represented in the superficial syntactic structure.

### 5.1. *Deletion Anaphora and Consistent/Contradictory Ambiguities*

Consider the following sentences:

- (90) John believes that the earth is larger than it is
- (91) —but Joan doesn't.
- (92) —but not Joan.
- (93) —and so does Joan.
- (94) —and the moon, smaller.

Example (90) exhibits the well-known ambiguity, discussed extensively in Postal (1974) and Hasegawa (1972), between a "stupid" reading on which John believes a contradiction and a "sensible" reading on which John believes that the earth is some particular size, whereas in fact (at least in the opinion of the speaker) it's not that large. The following four continuations, each involving some kind of deletion anaphora, all exhibit the same ambiguity. This is exactly what is expected under a deletion theory of this kind of anaphora, since the syntactic structures underlying the surface anaphors contain the ambiguity too. Other examples show that this is in fact a general property of deletion anaphora:

- (95) We expected John to claim that the earth is larger than it is
  - and he did.
  - and he did so.
  - and so he did.
- (96) Someone told me that the earth is larger than it is, but I can't remember who.
- (97) They wanted me to believe that it is farther to the door than it is, and so it seemed at first.

In every case, deletion anaphora preserves the stupid-sensible ambiguity, just as we expect.

Compare, however, the effect of pronominalization on null complement anaphora:

- (98) John believes that the earth is larger than it is, but Joan doesn't believe it.
  - and Joan believes it too.
- (99) I claimed that Sue was older than she was, and Lennie agreed.

In such cases most people agree that the ambiguity disappears and that only the "stupid" reading is possible.<sup>28</sup> Some people, who reject the stupid reading entirely in all cases and for whom the sentences in (90)–(97) are consequently unambiguous, reject (98) and (99) as "making no sense".

Similarly, consider the contrast between VP Deletion and *do it* anaphora:

- (100) I wanted to prove that the cardinality of the set was greater than it was,  
       —but I couldn't.  
       —but I couldn't do it.

VP Deletion anaphora preserves the ambiguity, while *do it* anaphora seems to block the sensible reading.

It is easy to see why deletion anaphora should preserve these ambiguities: since those processes are in all respects dependent on superficial syntactic properties of the anaphorized constituents, there is no reason to expect them to do anything other than to pass on ambiguities that are present in (or associated with) the underlying syntactic representations. It is perhaps not so transparent why nondeletion anaphora should be opaque to the sensible reading.

The crucial property of this construction that produces this effect, it seems, is that there is no coherent entity in the semantic representation, on the sensible reading, that would correspond to the anaphorized constituent. In the semantic representation of (98), for example, there is no proposition that the pro-form *it* could represent that is consistent with the sensible reading; for what John believes is not directly represented, but only compared with reality, and no matter what Joan believes, it cannot be semantically equivalent to anything that is otherwise present in the semantic structure.

### 5.2. *The Global Nature of Sentential it-Anaphora*

The observations of the preceding section have interesting consequences for the development of a general theory of anaphora. The fact to be accounted for is that nondeletion anaphors not only exhibit no evidence of having had a syntactically present nonanaphoric ancestor, they furthermore apparently cannot be interpreted by reference to a syntactic antecedent that does not correspond to a coherent semantic unit. This means that such anaphors are assigned readings not by an interpretive rule that operates at some superficial syntactic stage (as has been proposed, e.g. by Jackendoff (1968, 1972), for definite NP-pronouns) but rather by a rule that refers directly to semantic representation.

The syntactic nonbehavior of pronominal ancestors led us to conclude that deep anaphors are present from a very early stage (underlying representation, so far as we know); the observations of this section show that the interpretation of deep

<sup>28</sup> This fact is also noted in Postal (1974), for *S-it* anaphora.

anaphors (at least the sentential ones, which are the only ones that at present provide evidence) is also determined at that level. The argument of Lakoff (1968) referred to in footnote 22 supports essentially the same conclusion.

On the other hand, these sentential pro-forms are subject to the well-known restrictions on precede-command relations between antecedent and anaphor, which are determined at surface structure:

- (101) That Betty is claimed to be pregnant doesn't make it true.
- (102) \*It doesn't make it true that Betty is claimed to be pregnant. [Ungrammatical on a reading where the second *it* is anaphorically related to the proposition that Betty is pregnant.]

In (101) the *it* represents the proposition *that Betty is pregnant*. In (102), which is derived from (101) by Extraposition, this reading is impossible, and the only difference is that in (102) the operation of Extraposition has changed the structural relations so that *it* precedes and commands the syntactic descendants of its underlying antecedent.

Taking Lakoff's observation and this one together, there appears to be no escape from the globality of sentential *it* anaphora: the semantic content of the anaphor is determined at an early (at least precyclic) stage, but it is subject to surface constraints on where it may appear in relation to its antecedent (or rather to the syntactic descendants of the component parts of its antecedent, which may itself be deceased).

In the following and final section, we will present a general theory of anaphora that at least minimally satisfies the requirement of consistency with the observations we have made in this article.

## 6. A Theory of Anaphora

### 6.1. Summary of Conclusions

1. Anaphoric processes divide into two classes: *deep anaphora*, in which the anaphor is not derived transformationally but is present in underlying representations; and *surface anaphora*, in which the anaphor is derived transformationally by deletion.
2. Some anaphoric processes accept pragmatic control and others do not. (All anaphoric processes accept syntactic control.)
3. The pragmatically controllable anaphors are just the deep anaphors.
4. The division between deep and surface anaphora does not coincide with either the division between ISA and IRA or the division between null anaphora and pronominal anaphora.
5. Surface anaphora requires superficial syntactic identity of structure between the antecedent segment and the segment to be anaphorized; it does not require that the anaphor represent a coherent semantic unit.

6. Deep anaphora does not require that the anaphor be related to a superficially coherent syntactic entity, but it does require that it represent a coherent semantic unit.
7. Both kinds of anaphora are subject to the BAC: an anaphor cannot be anaphorically related to a nonanaphoric segment that it precedes and commands in surface structure.<sup>29</sup>

## 6.2. *The Theory*

In this final section we will outline a theory of anaphora that accounts for the observed properties of anaphoric processes. This account incorporates features of several previous approaches, but differs fundamentally from all of them, at least to the extent that they have been explicit.

*6.2.1. Deep and Surface Anaphora.* The most fundamental consequence of our investigation is that there are two distinct types of anaphors, derived in quite different ways. Here we advance an explicit proposal as to how these two types of anaphors are derived, and indicate why other proposed or possible treatments must be rejected.

*6.2.1.1. Deep Anaphora.* We propose that deep anaphors are available for insertion into underlying syntactic representations and must in effect represent semantic units. So far as we know, it makes no difference whether it is assumed that the anaphors are inserted into a classical deep structure and assigned a semantic interpretation by a projection rule, or that they are inserted into more abstract structures that already represent the semantic interpretation of the sentence in place of a semantic unit.

The conditions on insertion (and interpretation) are that the speaker presumes the content of the anaphor to be recoverable, either from linguistic context (in which case the anaphor has an "antecedent" in linguistic structure, a fully specified linguistic form with the same semantic content) or from the pragmatic environment.

The syntactic structure containing the anaphor is then subject to the operation of syntactic transformations, which may destroy the integrity of the syntactic representation of the antecedent and move antecedent and anaphor about with respect to each other. The only further constraint is that in surface structure no anaphor may be interpreted as being associated with an antecedent that (more properly, the syntactic descendants of which) it precedes and commands. Thus certain underlyingly well-formed interpretations of anaphors are discarded as incompatible with an independent requirement on the surface relation between anaphors and their antecedents.

As was pointed out in section 1, the question of whether anaphors are present from the level of underlying structure is independent of the question of whether they

<sup>29</sup> This statement of the constraint on backwards anaphora is vastly oversimplified and is possibly even stated in terms of the wrong primitives.

receive semantic interpretation at that level or at some superficial level. Our proposal for deep anaphors is an "interpretive" approach in the sense that the anaphors are not syntactically derived from full underlying forms; it does *not*, however, involve interpretation of such anaphors at a superficial level.

This deep interpretive approach is forced in the case of sentential deep anaphora, as seen in the last section; any attempt to assign an interpretation to a sentential deep anaphor at a later than precyclic stage runs afoul of the possible disintegration of its antecedent. On the other hand, a superficially coherent form cannot serve as antecedent for deep anaphora if it was not underlyingly (semantically) coherent.

Since we are forced to assume deep interpretation for sentential deep anaphors, we propose it for nonsentential ones as well, contra Jackendoff (1968, 1972), who proposes cyclic interpretation for definite pronouns, and contra Wasow (1972), Shopen (1972), Fiengo (1974), and others who propose treating all anaphoric phenomena as interpretive processes operating at a superficial level. So far as we know, the only arguments that have ever been advanced for the interpretation of deep anaphors of any kind at any superficial (cyclic or postcyclic) stage have been based on the assumption that the BAC is a constraint on the application of anaphoric processes. A classical example is Ross's argument (1969a) that definite pronominalization is cyclic. This assumption is impossible to maintain in the face of the observations in the last section (unless the anaphoric processes are formulated globally, which is to abandon the claim that they apply at any level at all).

We will discuss the nature of the BAC in some detail in the next section. Our conclusion here is that the observed behavior of sentential deep anaphora is inconsistent with any treatment that interprets such anaphors at a superficial level, and this invalidates any arguments for superficial interpretation of any anaphors on the basis of the superficial nature of the BAC. We conclude that the most unified theory of anaphora consistent with the facts is one in which all deep anaphors are interpreted at the level of underlying structure, if they are interpreted at any level at all.<sup>30</sup>

**6.2.1.2. Surface Anaphora.** Surface anaphors are derived from fully specified syntactic forms by deletion under identity with antecedent forms at "surface" level (the question of whether or not there are housekeeping processes like *Do* Support or Affix Hopping that follow certain surface anaphoric processes is interesting but not our concern here).

The reasons for adopting this position have been discussed in detail above. The arguments that the deletion applies at surface level are conclusive, and the superficial nature of these processes has never been challenged.

<sup>30</sup> In an investigation of Reflexivization in Icelandic, Thrainsson (1976) shows that Jackendoff's proposal for cyclic assignment of coreference relations between pronominal NPs and their antecedents can be maintained only at the expense of clear and obviously significant generalizations about the distribution and interpretation of reflexives. He concludes that coreference must be indicated in underlyingly syntactic representations, contrary



The difference in pragmatic controllability between deep and surface anaphora is accounted for by the fundamental difference in the way in which the anaphoric relation is established in the two cases. In the case of deep anaphora, we have hypothesized a free assignment of semantic interpretation to the anaphor, presuming only that the semantic entity associated with the anaphor is otherwise present in the context, linguistic or pragmatic. On the other hand, surface anaphora is a set of superficial processes for eliminating redundant segments; these processes affect superficial linguistic forms and apply directly under the control of superficial linguistic forms.

6.2.2. *On the Notion "Anaphoric Relation" and the BAC.* We have observed that the BAC holds for deep and surface anaphora alike: an anaphor of either kind is prohibited from occurring to the left of and commanding its antecedent in surface structure (but see footnote 29). In the case of surface anaphora, since the syntactic deletion processes that create the anaphors operate at a superficial syntactic level, it would be possible to interpret the structural conditions on the relation between anaphor and antecedent as conditions on the operation of the rules themselves; in fact, this is exactly the way they are generally viewed. This is impossible for deep anaphora, however, even though the constraints on surface anaphor-antecedent relations are the same. We must therefore propose a formulation of the BAC that applies to all anaphor-antecedent relations, independent of how the anaphor is derived.

In order to do this we will need the notion *anaphoric relation* independent of the means by which the relation is established. It is by no means easy to define this notion explicitly, and we will not attempt it here. Every anaphor that is syntactically controlled is by definition in anaphoric relation with some linguistically present segment, the segment by reference to which the anaphor may be interpreted. We will formulate the BAC as a surface constraint on where anaphors may be located with respect to their antecedents, as follows:<sup>31</sup>

*The Backwards Anaphora Constraint*

An anaphor cannot be interpreted as being in anaphoric relation to a segment that it precedes and commands in surface structure.

Thus stated, the BAC is an interpretation filter: our system allows anaphoric relations to be created freely, without regard to the structural relation of anaphor and antecedent; the BAC filters out any interpretations that would require an anaphor and antecedent to be in an ill-formed structural relation in surface structure.

In the case of deep anaphora, where the anaphoric relation is established in underlying structure, the operation of the BAC involves global reference, in that the

to Jackendoff's fundamental assumption. This result is in accord with the general theory of anaphora developed here.

<sup>31</sup> A similar proposal for definite pronominalization, formulated in somewhat different terms, is discussed in Lasnik (ms.).

descendants of the antecedent must be kept track of. The globality, however, is confined entirely to the problem of recording the anaphoric relation. We could imagine the creation (by whatever process) of an anaphoric relation as "binding" the anaphor to the antecedent, and the BAC as an independent surface constraint on segments bound in this way.<sup>32</sup>

### 6.3. Conclusion

Language provides us with two ways to avoid redundancy: redundancy at the deep level can be eliminated by substituting a deep anaphor for a semantic unit that appears elsewhere in the discourse or in context; redundancy at the surface level can be eliminated by substituting a surface anaphor (generally null) for a surface segment that appears elsewhere in the linguistic structure (including wider discourse). Since the condition on surface anaphora is that there must be an identical surface segment elsewhere, pragmatic control of surface anaphora is impossible.

One question which remains is: why should there be a Backwards Anaphora Constraint? This is a question to which we have no answer at all, except to note the obvious fact that it serves to ease the task of recovering the interpretation for an anaphor. The BAC in effect blanks out large portions of the discourse from the point of view of an anaphor, guaranteeing that its antecedent will not be in those portions. The fact that when he encounters an anaphor, he can be sure that its antecedent is either in previous discourse or in a higher clause in the same sentence is no doubt very useful to the native listener. If we are correct in claiming that the BAC is an interpretation filter, and if it does have a functional explanation, then it is not surprising that it applies at surface structure and constrains both kinds of anaphora.

One of the consequences of the discovery that pragmatic control is impossible for surface anaphora (pointed out to us by Mark Liberman, whose observations we reproduce here almost verbatim) is that it constitutes counterevidence to what might be called the null hypothesis of discourse structure. We know that discourses have some kind of structure, but in general the structure of a discourse can be viewed as a pragmatic entity defined on the meanings of its constituent sentences. We can call this the null hypothesis, since the only restriction imposed is that the discourse "make sense", and even this restriction is imposed only by the ethics of cooperative endeavor. On this hypothesis, a creature that could interpret sentences in isolation, and who was adequately endowed with common sense, would need no additional apparatus in order to converse just like us normal humans.

Most of the phenomena that have been advanced as facts about discourse structure seem to be the sort of thing that such a creature would handle without difficulty—"pragmatic presupposition" is one such case. But the behavior of anaphora would

<sup>32</sup> The implications of the suggestion for a theory of semantic interpretation are explored more thoroughly in Hankamer (1976).

pose a problem. Pragmatically controlled anaphors behave just as the null hypothesis predicts—as long as some appropriate meaning for the anaphor can be found, all is well. But in the case of syntactically controlled anaphora, there is a purely linguistic requirement imposed on the preceding discourse, namely that it contain an explicit antecedent of the appropriate syntactic form. Thus the creature would apparently be unable to mimic our treatment of such cases, since neither the meaning of the individual sentences in the discourse, nor any pragmatic structuring of these meanings in the light of general knowledge and belief, would seem to provide the basis for the appropriate judgments.

In short, if we were to accept the null hypothesis, we would expect either that intersententially controlled surface anaphora would not exist at all, or that it would be indistinguishable from intersentential deep anaphora. Neither is the case. The conclusion must be that there is a syntax of discourse; the assumption that an adequate description of linguistic competence can be represented in a sentence-generating grammar must be given up.

If we are to take seriously the task of describing deep anaphora, in fact, it is clear that not even a grammar of discourse will do, unless it provides for some representation of at least some aspects of nonlinguistic context. The linguistically controlled cases of deep anaphora are relatively easy to describe, given a complete representation of a discourse: a deep anaphor may be substituted for one instance of any semantic unit of the appropriate kind that appears twice. But how, exactly, are we going to describe the use of deep anaphors when there is no linguistic control? The only way, if we take the job seriously, is to assume a representation of the discourse *situation*, which includes not only the representation of the linguistic events, but some “stage directions” as well.

This move, however, would probably take us out of linguistics, and into the study of human knowledge and perception, belief, the nature of the physical universe, and everything else.

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