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Pronouns

1 Introduction

A very natural, preliminary classification of the uses of pronouns would include the following three categories:

(*i*) Pronouns used to make a reference to an object (or objects) present in the shared perceptual environment, or rendered salient in some way. The sentence (1),

(1) He's up early

said of a man passing in the street, or (2),

(2) I'm glad he's left

said of a man who has just walked out of the room, exemplify this use.

(*ii*) Pronouns intended to be understood as being co-referential with a referring expression occurring elsewhere in the sentence. One of the readings of the sentence (3) results from such a use of the pronoun *his*.

(3) John loves his mother.

(*iii*) Pronouns which have quantifier expressions as antecedents, and are used in such a way as to be strictly analogous

to the bound variables of the logician. The pronoun in the sentence (4) appears to be used in this way.

(4) Every man loves his mother.

I have two main points which I want to make about pronouns. First, there is a fourth category, which I call 'E-type pronouns', the members of which are very frequently confused with the members of category (*iii*), but which in fact are semantically quite different. E-type pronouns also have quantifier expressions as antecedents, but they are not bound by those quantifiers. For example, the pronoun in the sentence (5):

(5) Few MPs came to the party but they had a good time

is an E-type and not a bound pronoun. I shall discuss these pronouns in section 2.

My second main point concerns the semantics of pronouns in category (*iii*)—'bound pronouns', as I shall call them. Linguists tend to regard the semantics of bound pronouns (or of bound variables) as a mystery clearly understood by logicians, and to leave matters there. But we cannot afford to be so incurious. It is a very striking fact about pronouns in natural languages that they have this use, in addition to their other uses, and we must wonder whether this is an accident, or whether there is some underlying semantic principle which accounts for these apparently disparate uses in a unified way. In fact there is this very striking connection between pronouns in categories (*ii*) and (*iii*): whenever we substitute a singular term for a quantifier binding a pronoun, we arrive at a sentence in which the pronoun can be interpreted as co-referential with that singular term. This surely suggests that some common principle underlies the use of pronouns in categories (*ii*) and (*iii*)—that the capacity we have to understand sentences like (3) is, at the very least, *connected with* the capacity we have to understand sentences like (4). If we look at matters in this way, we see that the relationship between pronouns in categories (*ii*) and (*iii*) is a version of a problem which is frequently encountered in semantics, for there are many devices which occur, apparently univocally, in both singular and quantified

sentences. The semantic problem posed by those dual occurrences can be solved quite generally if we provide a semantic account of quantified sentences which proceeds by way of a semantic account of their singular instances. If we adopt such an account, which is motivated quite independently of any consideration of pronouns, we have only to explain the semantic significance of pronouns in category (*ii*) and nothing whatever has to be said, in addition, about pronouns in category (*iii*)—they simply look after themselves. I shall attempt to show this in section 3.

The ideas which I shall advance in section 3 place me in direct opposition to an approach to pronouns originally advanced by Lasnik[1] and received with favour by some other linguists.[2] One way of explaining Lasnik's main idea is to say that he proposes an incorporation of pronouns in category (*ii*) into category (*i*). If we regard an object's having been mentioned in a previous conversation, or having been mentioned previously in the conversation, as a way of its being salient for purposes of reference, as we must, why should we not regard being mentioned elsewhere in the same sentence as a limiting case of this mode of salience? If we do so, there is no good reason for distinguishing pronouns in category (*ii*) from those in category (*i*). (Since the reference of pronouns in category (*i*) is determined by what may loosely be called 'pragmatic' factors, I shall call Lasnik's theory 'the pragmatic theory of co-reference'.) At first sight, Lasnik's proposal has the appeal of simplicity, but on further reflection, we can see that its price is too high. For to assimilate pronouns in category (*ii*) to those in category (*i*) is to preclude the recognition of any connection whatever between pronouns in the unified category (*i*) + (*ii*) and those in category (*iii*)—that is, it forces us to regard as a complete accident that the same expression shows up in both (3) and (4). I shall attempt to explain this point, and the distinction

[1] H. Lasnik, 'Remarks on Coreference', *Linguistic Analysis* 2 (1976), pp. 1–22.
[2] See, e.g., Bresnan, 'A Realistic Transformational Grammar', in M. Halle, J. Bresnan, and G. A. Miller (eds), *Linguistic Theory and Psychological Reality* (Cambridge, Mass.: MIT Press, 1978); Chomsky 'Conditions on Rules of Grammar', *Linguistic Analysis* 2 (1976), pp. 303–51. Lyons puts forward a doctrine similar to Lasnik's in Lyons, *Semantics*, 2 (Cambridge: Cambridge University Press, 1977), sect. 15.3.

between pragmatics and grammar which it forces upon us, in section 4. In the remaining section I shall advance some other criticism of Lasnik's approach to pronouns.

2 The Existence of E-Type Pronouns

I shall begin my attempt to demonstrate the existence of a fourth category of pronouns by considering sentences containing plural quantifiers, since the distinction between a bound and an E-type interpretation of a pronoun comes out most clearly when the pronoun has a plural quantifier as antecedent. Consider the two sentences (6) and (7):

> (6) Few congressmen admire only the people they know.

> (7) Few congressmen admire Kennedy, and they are
>   very junior.

At first sight the relationship between the quantifier phrase *few congressmen* and the pronoun *they* in these two sentences appears to be the same, but on closer inspection we can see that it is really quite different. In (6) the pronoun is bound by the quantifier phrase, while in (7) it cannot be. If the pronoun in (7) is to be bound by the quantifier phrase, *few congressmen*, then its scope must extend to the second conjunct, and the sentence would be interpreted as meaning that few congressmen both admire Kennedy and are very junior. But this is not the interpretation naturally placed upon (7). First, (7) entails, as its supposed paraphrase does not, that few congressmen admire Kennedy, period. Second, (7) entails, as its supposed paraphrase does not, that *all* the congressmen who admire Kennedy are very junior.

Similarly, in the sentence (8), the quantifier phrase *some sheep* does not bind the pronoun *them.*

> (8) John owns some sheep and Harry vaccinates them
>   in the spring.

If it did bind the pronoun, the sentence would be equivalent to (9), in which both pronouns are bound.

> (9) Some sheep are such that John owns them and
>   Harry vaccinates them in the spring.

But (9) is not equivalent to (8). (8) entails, as (9) does not, that Harry vaccinates *all* the sheep which John owns.

A useful test of whether or not a pronoun is bound by an antecedent quantifier is to replace the antecedent with the quantifier expression *No*, and see whether the result makes sense. Where a pronoun is bound by a quantifier, as in (10),

(10) Few men despise those who stand up to them

it is part of a complex predicate (e.g. '(   ) despise those who stand up to them'), which is affirmed to be satisfied in the case of many girls, some sheep, or, in the example, few men, and which can be affirmed to be satisfied in the case of no girls, no sheep, or no men. Thus we have:

(11) No men despise those who stand up to them.

When we apply this test to pairs of examples we have considered, we find confirmation of the semantic difference which we have noticed.

(12) No congressmen admire only the people they know.

(13) *No congressmen admire Kennedy, and they are very junior.

(14) No sheep are such that John owns them and Harry vaccinates them in the spring.

(15) *John owns no sheep, and Harry vaccinates them in the spring.

When a pronoun is bound by a quantified expression, it does not makes sense to ask to what it refers (on that occasion of use). If you have any doubt of this, you should be able to convince yourself of its truth by attempting to answer the question in the case of sentences like (4), (6), (11), (12), and (14). You will get into hopeless muddles, which have been analysed in detail by Geach in his book *Reference and Generality*.[3] How the semantic functioning of bound pronouns is to be accounted for is something I shall discuss in section 3, but it ought to be clear at even this early stage

[3] P. T. Geach, *Reference and Generality* (Ithaca, NY: Cornell University Press, 1962).

that a pronoun bound by a quantifier does not refer to anything. However, just looking at the examples we have so far considered, it appears that the pronouns we have shown not to be bound by their quantifier antecedents *are* interpreted as referring to something. If someone asked, about (8), 'Harry vaccinates *them*? Which sheep?', the natural (and, in my view, rule-governed) answer is: 'The sheep which John owns, of course.' Equally, the question '*They* are junior? Who do you mean?' would be answered 'Why, the congressmen that admire Kennedy.' It looks as though the role of the pronoun in these sentences is that of referring to the object(s), if any, which *verify* the antecedent quantifier-containing clause.[4] If this is the role of these E-type pronouns, we explain why the truth of the clause containing them requires that *all* the relevant objects satisfy the predicate, and we explain why these pronouns cannot have a *No* quantifier as antecedent.

It is clear from the examples I have given that whether or not a pronoun is interpreted as bound by a quantifier phrase depends upon the grammatical relation in which it stands to that quantifier phrase. All the examples so far have involved coordinate structures, but consideration of a wide range of examples containing plural quantifiers supports the generalization that a pronoun will be interpreted as bound by a quantifier phrase only if it precedes and *c*-commands the pronoun.[5] Using this rule, one can construct endless examples of E-type pronouns:

(16) After Harry bought some sheep, Harry vaccinated them.

(17) *After Harry bought no sheep, Harry vaccinated them.

(18) If many men come to the ball, Mary will dance with them.

[4] By 'objects, if any, which verify the antecedent quantifier-containing clause' I mean those objects, if any, which satisfy the predicate in the antecedent clause and thereby make that clause true.

[5] A constituent A *c*-commands a constituent B if and only if B is dominated by the first branching node which dominates A. In 'Pronouns, Quantifiers and Relative Clauses (I)' [reprinted here in Chapter 4. Ed.] I used Klima's term 'in construction with' for the converse of this relation.

(19) *If no men come to the ball, Mary will dance
      with them.

When we come to consider *singular* quantifiers, it appears
that the precede and *c*-command relationship marks a similar
semantic distinction. For example, it is clear that the scope
of the quantifier in the sentence (20):

(20) Just one man drank champagne and he was ill

can extend only to the end of the first clause; if it is inter-
preted as extending to the whole sentence, to bind the
pronoun *he*, we get the quite different proposition: 'Just one
man both drank champagne and was ill'. The point also
shows up very clearly with *every*-sentences. When the quanti-
fier *every* precedes and *c*-commands a singular pronoun, as
in (4), the pronoun is interpreted as bound, but when it does
not stand in this relation to the pronoun, the result is un-
acceptable:

(21) *Every congressman came to the party, and he
      had a marvellous time.[6]

If it is the role of pronouns not *c*-commanded by their
quantifier antecedents to refer to the object(s) which verify
the antecedent clause, the deviance of (21) is explained, since
in the antecedent clause there are asserted to be a plurality
of such objects. (21) is certainly improved by pluralizing
the pronoun:

(22) ?Every congressman came to the party, and they
      had a marvellous time.

It is also possible to show that the precede and *c*-command
configuration determines the difference between bound and
E-type pronouns in the case of the simple existential quanti-
fiers, 'some man', 'a boy', 'there is a girl', etc. If we look back
on the arguments which we have used to show that a given
pronoun is not bound by a quantifier antecedent, we shall
see that they are basically of two kinds. One kind of argu-
ment is a scope argument; we show that in order to give
a certain sentence the correct interpretation, the scope of the

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[6] (21) is very similar to an example noticed by Chomsky, op. cit.: '(i) Every
soldier is armed, but will he shoot?'

quantifier cannot extend to the clause containing the pronoun—we show that the quantifier must have 'narrow scope'. If we use 'Q + CN' to represent a given quantifier plus common noun, 'A( )' to represent the context of the quantifier expression in the first clause, and 'B( )' to represent the context of the pronoun in the second clause, then the conjunctive sentences on which we have been concentrating can be represented schematically as follows:

A(Q + CN) and B(it/them, etc.).

To represent the pronoun in the second clause as bound requires understanding the whole sentence as having the form:

$Q_{CN}x(A(x)$ & $B(x))$

in which the quantifier phrase, $Q_{CN}x$, e.g. 'For some man x', 'For all girls y', has 'wide scope'. And in the case of certain quantifiers (*few, most, just one, three,* etc.), we are able to show that this interpretation is incorrect, since the original sentence entails, as the 'wide scope' interpretation does not, the simple:

$Q_{CN}x(A(x))$.

The second kind of argument that a pronoun is not bound depends upon its being interpreted in such a way that the truth of the clause containing it requires that *all* of the objects of a certain class satisfy the predicate of that clause. This again is a feature of the interpretation of the sentence which does not obtain if the pronoun is taken to be bound by the quantifier. I explained this feature by suggesting that the pronoun has a referential role, similar to that of the phrase 'the congressman who came' etc.

With slight modification, both of these kinds of argument can be constructed for the case of the simple existential quantifiers. A scope argument cannot focus upon conjunctive sentences, since the wide scope:

Some man x (A(x) and B(x))

does entail:

Some man x (A(x)).

However, a clear difference between wide and narrow scope interpretations of the existential quantifiers shows up in conditional sentences. Thus, in the sentence (23):

> (23) If a man enters his room, he will trip the switch

we must give the *a man* quantifier narrow scope (leaving *he* unbound); we are not saying that there is a man such that if *he* comes, he will trip the switch. Equally, in the sentence (24):

> (24) If there is a man in the garden, John will tell him
>   to leave

the *there is a man* quantifier must have narrow scope; we are not saying that there is a man such that, if *he* is in the garden, John will tell him to leave.

The second kind of argument can apply even in cases in which the scope argument cannot apply, but we must first ask what is the feature of the use of a *singular* pronoun which corresponds to the requirement made by a plural pronoun that *all* the members of a certain class satisfy the predicate. If it is the role of E-type pronouns in general to refer to the object or objects which verify the antecedent clause, and if an E-type pronoun is singular, then we would predict that the use of that pronoun will convey the implication that there is *just one* object verifying the antecedent clause—an implication which is not carried by the use of the existential quantifiers themselves. It seems to me that this is exactly what we find. When a pronoun is in a clause coordinate with the clause containing the quantifier, as in (25),

> (25) Socrates owned a dog and it bit Socrates

there is a clear implication that Socrates owned just one dog. It is precisely because of the implication carried by such pronouns that it is not acceptable to report the non-emptiness of the class of Welsh doctors in London by saying (26):

> (26) There is a doctor in London and he is Welsh.

Notice that no such implication is carried by the use of a pronoun which is *c*-commanded by its antecedent:

(27) Socrates owns a dog which bites its tail.

This point about uniqueness may be felt to be slender evidence, though the counter-examples that have been suggested to me normally ignore the temporal parameter implicit in the tense of the verb.[7] In a great many cases the implication is clear, and since the presence or absence of this implication appears to depend upon the precede and *c*-command configuration presumed to be relevant on quite independent grounds, the hypothesis that that configuration determines the difference between bound and E-type pronouns seems to be sustained even in the case of simple existential quantifiers.

The principle I have stated effectively restricts the scope of a quantifier to those elements which it precedes and *c*-commands. However, there are quantifiers in English which are almost always given wide scope, and the principles must be qualified to exclude them. The two most important examples are *a certain* and *any*. Thus, in the sentences (28) and (29), the quantifiers are given wide scope, and the pronouns are bound and not E-type.

(28) If a certain friend of mine comes, he will tell the police.

(29) If any man loves Mozart, he admires Bach.

I mention these exceptions not only for the sake of accuracy, but also as a partial explanation of why it has taken so long for the important *grammatical* distinction between bound and E-type pronouns to be noticed. If these 'wide-scope-seeking' quantifiers are not excluded, it is very difficult to see a pattern in the jumble of examples.

[7] e.g. the sentence (i) has been given to me by Geach as a counter-example to my claim that such pronouns carry an implication of uniqueness:

(i) Socrates kicked a dog and it bit him and then Socrates kicked another dog and it did not bite him.

However, the tense in the verb effectively introduces an initial existential quantifier *There was a time such that* . . . , and my claim is that the truth of the sentence requires that there be a time such that Socrates kicked only one dog *at that time*, not that Socrates only kicked one dog *ever*. However, the interpretaton of *a*-expressions is unclear, and we may be forced to recognize that they are sometimes used as equivalent to *any* and sometimes to *a certain*. (See below.) This affects only the scope, and not the substance, of my claim.

Finally, what is the importance of the distinction between bound and E-type pronouns—of the addition of another category of pronouns to the list? Not, it must be admitted, very great. Pronouns are often used as referring expressions, and it is not particularly surprising that some of them should have their reference fixed by a description recoverable from the antecedent, quantifier-containing, clause. The point only assumes importance in the context of certain current views. Certain logically-minded philosophers have been so impressed by the undoubted analogies which exist between some pronouns and the bound variables of quantification theory that they have enthusiastically adopted the hypothesis that *all* natural language pronouns with quantifier antecedents are bound by those antecedents.[8] Other researchers, concentrating upon sentences containing E-type pronouns, have naturally been impressed by the idea that such pronouns are referring expressions, and have, in a contrary excess of enthusiasm, attempted to regard bound pronouns as referring expressions, but without any success. There has therefore arisen the idea that there are two approaches to the unified subject of 'anaphora'—the bound variable, and the referential—between which we have to choose.[9] The one merit of taking seriously the argument of this section is that this profitless debate should end. There is not a single class of pronouns for which we must find a unitary explanation. There are two kinds of pronouns, which are sharply distinguished by their grammatical position, and which function in quite different ways.[10]

[8] The most prominent example is Geach; see esp. the papers collected in sect. 3 of *Logic Matters* (Oxford: Blackwell, 1972).

[9] See, e.g., Stenning, 'Anaphora as an Approach to Pragmatics', in Halle, Bresnan, and Miller (eds), op. cit.

[10] I am by no means the first to have noticed that some pronouns with quantifier antecedents are not bound by them. Apart from the paper of Chomsky's cited in fn. 2, reference should be made to Karttunen, 'Pronouns and Variables', in R. I. Binnick, A. Davison, G. Green, and J. Morgan (eds), *Papers from the Fifth Regional Meeting of the Chicago Linguistic Society* (Chicago, Ill.: University of Chicago, 1969) and R. Jackendoff *Semantic Interpretation in Generative Grammar* (Cambridge, Mass.: MIT Press, 1972). However, these works contain isolated examples rather than theory, and give no clue of the extent of the phenomenon. In reply to an example of Jackendoff's, Janet Fodor (*Semantics: Theories of Meaning in Generative Grammar* (New York: Crowell, 1977)) suggests that the thesis that all pronouns with quantifier antecedents are bound might be sustained

3 The Semantics of Bound Pronouns

With E-type pronouns out of the way, we can raise the question of the proper treatment of bound pronouns. Any such treatment must take account of two fundamental points. The first point is very well known. We cannot give the same account of the pronoun in the sentence (4):

(4) Every man loves his mother

as we might be inclined to give to the pronoun in the sentence (3),

(3) John loves his mother

namely that of referring to whatever its antecedent refers to, since the antecedent expression *every man* is not an expression referring to anything.[11] I mentioned the second point in my introduction; it is equally important but it has not received the attention it deserves. We cannot give utterly unconnected explanations of the roles of the pronouns in the sentences (3) and (4); it is simply not credible that the speaker's capacity to understand the sentences 'John loves his mother', 'Harry loves himself', 'Susan admires those who are nice to her', etc., is in no way connected with his understanding of the sentences 'No man loves his mother', 'Every man loves himself', 'Just one girl admires those who are nice to her', etc. Putting these points together, we are confronted with the following problem: we must provide an account which is adequate to deal with pronouns in both our categories (*ii*) and (*iii*), but we cannot *directly* apply the most obvious account of pronouns in category (*ii*) to pronouns in category (*iii*).

This may seem to be an insoluble problem, but in fact it is a version of a problem with which the semantics of quantified sentences make us very familiar. For there are many devices which appear in both singular and quantified sentences in such a way that, though the two uses are clearly

by 'relaxing the usual constraints on the binding of variables' (p. 192)—an intriguing proposal which I wish I could understand.

[11] Even if you can persuade yourself that *every man* refers to every man, *his* still cannot be co-referential with its antecedent, on pain of generating the incorrect reading: every man loves the mother of every man.

connected, the most obvious account of their occurrence in singular sentences does not immediately apply to their occurrence in quantified sentences. The most familiar examples are provided by the sentential operators, *and, or, if,* etc. When these expressions join singular sentences, as in (30),

(30) If John is in love, John is happy

they can be regarded as truth-functions—that is to say, expressions which map pairs of truth values onto truth values. If they joined only singular sentences—expressions which have a truth value—then all we would need to say about them is that they yield a true sentence when the constituent sentences have such-and-such a combination of truth values. But, in the sentence (31)

(31) If any man is in love, he is happy

the constituents which *if* joins are not sentences with a truth value at all. (31) is true iff[12] any man satisfies 'if ( ) is in love he is happy', but here *if* joins the parts of a complex predicate, and since the parts do not have a truth value, we do not yet appear to have any account of this role. A position parallel to the one which certain contemporary linguists adopt in the case of pronouns would then be to cast around for another account to deal with the connective *if* in this role —a position on which *if* (and all the other connectives) are deemed to be ambiguous. But Frege, and subsequent logicians, were not content with this approach; they searched for a way to unify the two roles.

One very natural, though not the only, way of doing this was adopted by Frege. Frege's approach involves no modification whatever of the truth-functional account of the role of the connectives; this is left to stand as the single account of their semantic contribution. The novelty comes in the account which Frege offered of the notion of *satisfaction*. When a predicate is complex, a Fregean explains the notion of an object's satisfying it in terms of the *truth* of a sentence which results when a singular term referring to that object is substituted in, or coupled with, the predicate. Thus,

[12] i.e. 'if and only if'.

a Fregean does not define the conditions under which an object satisfies the predicate (32):

(32) If (   ) is in love, he is happy

directly, in terms of the satisfaction conditions of the two parts, but rather says this: an object x satisfies the predicate (32), iff the *sentence* (33):

(33) If (β) is in love, he is happy

is true when we interpret 'β' as referring to x. Now, relative to that interpretation of 'β', *if* once again joins expressions which may be assigned a truth value, and its role as a truth-function can be invoked.

I do not say that this is the only way to provide a unitary account of the role of the sentential operators, but it is certainly a very natural way. And it is completely general. If we adopt this Fregean explanation of what it is for an object to satisfy a complex predicate, we have only to explain the significance of a device as it occurs in singular sentences, and its occurrence in quantified sentences simply takes care of itself. In particular, this observation applies to pronouns; if we adopt a Fregean account of satisfaction, we have only to give an account of the pronoun-antecedent construction as it occurs in singular sentences—no further explanation need be given of pronouns with quantifier antecedents.

As we have seen, a natural explanation of the role of pronouns with singular antecedents is in terms of *co-reference* —the pronoun refers to whatever the antecedent refers to. This account will secure the result that there is a reading of the sentence 'John loves his mother' on which the reference of *his* is the same as that of *John*, and hence that the whole sentence is true iff John loves John's mother. If we put this obvious account together with the general Fregean explanation of satisfaction—an explanation which is independently needed to provide a unification of the roles of other devices which occur in both singular and quantified sentences— then we have an explanation of the role of the bound pronoun in (4):

(4) Every man loves his mother.

Such a sentence is true iff every man satisfies the complex predicate '( ) loves his mother'. By the Fregean explanation, we know that an arbitrary object, x, satisfies that predicate iff, taking 'β' as referring to x, the sentence '(β) loves his mother' is true. Now we can apply the co-reference rule quite properly, and learn that such a sentence is true iff the referent of 'β' loves the mother of the referent of 'β', and hence iff x loves the mother of x. Hence, x satisfies the complex predicate iff x loves x's mother, and so the whole sentence is true iff for every man x, x loves x's mother.

This explanation of the functioning of bound pronouns presupposes the following: that whenever we replace a quantifier which binds a pronoun with a singular term, in order to form a relevant substitution instance, the resulting sentence will be one which admits of a reading on which the pronoun is co-referential with that singular term. (I am ignoring the problem of number-agreement.) But this is exactly what we find. We remarked earlier that a quantifier can bind a pronoun only if it precedes and c-commands that pronoun, and it is sufficient (though not necessary) for a pronoun to be interpretable as co-referential with a singular antecedent that it be preceded and c-commanded by that antecedent. The fact that this is so constitutes a powerful argument, not for the need to unify the two roles, which I take to be indisputable, but for a unification along Fregean lines. The fact that there is this correspondence between sentences containing bound pronouns and singular sentences containing pronouns admitting of a co-referential interpretation can no more be regarded as an accident than the fact that pronouns are used in both singular and quantified sentences in the first place.

When we come to evaluate substitution instances of the form (β) *is A* we must use information about the context in which the original quantified sentence (e.g. 'Everything is A') is uttered in order to evaluate any ambiguous or context-dependent words which occur in A. In particular, we presume that anyone who utters a token of the sentence type (4):

(4) Every man loves his mother

intends to use *his* either as a device making an independent

reference to some salient object or as a device for registering co-reference. In the first case, we evaluate the truth of instances of the form '(β) loves his mother' by taking the reference of *his* to be constant and determined by the appropriate contextual factors. In the second case we evaluate it as before.

To summarize: while it is quite correct to observe that one cannot deal with bound pronouns by directly applying a co-reference rule, this point should not lead us to the desperate conclusion that pronouns with singular and quantified antecedents are semantically unrelated. If we employ a Fregean explanation of the notion of satisfaction of a complex predicate (and some such explanation is independently needed to deal with other devices which show up in both singular and quantified sentences), we find that a co-referential explanation of pronouns is all the explanation we need.

With these considerations in mind, let us look at the main ideas behind a theory of pronouns which is currently popular among linguists. I think that we can show that it is incompatible with this, or any other, attempt to see a unitary semantical phenomenon in pronouns with singular and quantified antecedents, and hence, must be wrong.

4 Consequences for Bound Pronouns of the Pragmatic Theory of Co-reference.

Lasnik begins his 1976[13] article by taking account of the existence of pronouns in category (*i*), and then goes on to question whether any additional account needs to be given of pronouns in the supposed category (*ii*). Pronouns in category (*i*) involve a reference to an object which is salient in some way. Since one of the ways in which an object can be salient is by having been mentioned in a previous conversation, it would appear to be possible to regard reference to an object mentioned elsewhere in the same sentence or clause as a limiting case of the exploitation of this kind of salience. What we might rather loosely call 'pragmatic' factors would seem to ensure that one of the uses of the sentence 'John loves his mother' is to say that John loves the mother of John.

[13] Lasnik, op. cit.

The flavour of this, at first sight very plausible, approach can be gathered from Lasnik's discussion of the sentence (34):

(34) After John talked to Mary, they left the room.

Within the system I have proposed . . . (34) is not problematic . . . that is, no co-reference rule is needed to explain (34) because there is nothing to explain. *They* in (34) can be used to refer to any group of entities; under many discourse situations however, John and Mary are the only likely candidates.[14]

Lasnik's main thesis is that 'even sentence-internal cases of co-reference are not produced by any rule'.[15] According to Lasnik, the only rule of the language which concerns the interpretation of pronouns is a rule of *Non*-co-reference which, for example, prohibits any two noun phrases related as *he* and *John* are related in (35) from being co-referential, unless the second is a pronoun.

(35) He is happy when John is in love.

I will not discuss Lasnik's Non-co-reference rule until the next section; what concerns me here is the view that all the rules of the language tell us about a sentence like (3):

(3) John loves his mother

is that the pronoun *can be* referential with *John*; there is no special rule which secures an interpretation on which it is.

Implicit in this statement of Lasnik's position, and throughout his paper, is the distinction between those facts about the interpretation of an utterance which are explained by reference to *the rules of the language*, and those facts which are explained by 'pragmatic' factors. Although the distinction is difficult to make precise, it is impossible to deny, since one must admit that there are facts about the interpretation of a sentence which are in no way determined by a linguistic rule. For example, there is no linguistic rule which determines that a *he* or a *that man* refers to x rather than y in the vicinity, or that it refers to someone who

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[14] In this and subsequent quotations, I have altered the numbering of examples to conform to the ordering in this article.

[15] Lasnik, op. cit., p. 9.

has just left rather than someone who has recently been mentioned.

Chomsky has built this distinction into his current framework.

Let us say that the grammar contains a system of rules that associate a derivation with a representation of LF (read 'logical form' but for the present without assuming additional properties of this concept). I will understand LF to incorporate whatever features of sentence structure (1) enter directly into the semantic interpretation of sentences and (2) are strictly determined by properties of sentence grammar. The extension of this concept remains to be determined. Assume further that there is a system of rules that associates logical form and the products of other cognitive faculties with another system of representation SR (read 'semantic representation'). Representations in SR, which may involve beliefs, expectations and so on, in addition to properties of LF determined by grammatical rule, should suffice to determine role in inference, conditions of appropriate use etc. (Some would argue that LF alone should suffice, but I leave that an open empirical question.)[16]

For his part, Chomsky has stated elsewhere his viewpoint on this empirical issue.

Given the logical forms generated by sentence grammar, further rules may apply. Pronouns not yet assigned antecedents may be taken to refer to entities designated elsewhere in the sentence, though this is never necessary, and is not permitted under certain conditions . . . These further rules of reference determination may involve discourse properties as well, in some manner; and they interact with considerations relating to situation, communicative intention and the like.[17]

One important, and traditional constraint upon the domain of grammar proper is that it should deal only with matters that are 'sentence-internal'. Chomsky considers the discourse (36):

(36) Some of the men left today. The others will
leave later

and argues, using this constraint: 'The rule assigning an interpretation to *the others* however is not a rule of sentence grammar at all, as (36) indicates.'[18] He continues:

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[16] Chomsky, op. cit., pp. 305–6.
[17] Chomsky, *Reflections on Language* (London: Temple Smith, 1976).
[18] Chomsky, 'Conditions on Rules of Grammar', p. 323.

Returning to the basic theory outlined earlier, the rule of reciprocal interpretation, and DR [Chomsky's rule of Disjoint Reference] relate derivations . . . to LF, while the rule assigning an interpretation to *the others* belongs to an entirely different component of the system of cognitive structures relating to LF and other factors to a full semantic representation. It might be quite appropriate to assign this rule to a theory of performance (pragmatics) rather than to the theory of grammar.

Chomsky then goes on to apply this point in the case of anaphoric pronouns:

In [15] I pointed out that the rules of anaphora associating *he* with *John* in such sentences as (37) appear to violate otherwise valid conditions, a problem for the theory presented there:

    (37)a. John thought that he would win.
        b. John thought that Bill liked him.

Others have reiterated this point, arguing that it undermines the theory outlined. But my observation was simply an error. The rule of anaphora involved in the (normal but not obligatory) interpretation of (37) should in principle be exempt from the conditions of sentence-grammar, since it is no rule of sentence grammar at all. Cf. Lasnik.[19]

Chomsky's notion of *rule of sentence grammar* comprises both syntactic and semantic (or interpretive) rules, and it is clear from his paper that when Lasnik maintains that 'even sentence internal cases of co-reference are not produced by any rule', he is using 'rule' in pretty much this sense. As his criticism of Jackendoff's interpretive rule of co-reference makes clear, Lasnik's thesis is not simply that there is no *syntactic* rule (e.g. a pronominalization transformation) underlying cases of co-reference. I stress this, because I do not wish to be taken to be committed to the existence of a pronominalization transformation by opposing Lasnik's basic thesis.

Although some line must be drawn between matters belonging to grammar (widely understood) and matters belonging to pragmatics, it is not at all clear where the line should be regarded as falling. For example, while it may be clear that *syntactic* processes are 'sentence-internal', it is not

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[19] '15' refers to Chomsky, 'Conditions on Transformations', in S. Anderson and P. Kiparsky (eds), *A Festschrift for Morris Halle* (New York: Holt, Rinehart & Winston, 1973); and 'Lasnik' to Lasnik, op. cit.

at all clear to me why *semantic* rules (rules mapping surface structures onto their logical forms, in Chomsky's current framework) can concern only single sentences taken one by one, rather than sequences of such sentences. The thesis that semantic rules are sentence-internal constitutes a substantial empirical hypothesis for which empirical reasons should be given. In the light of these and other similar questions, one might despair of being able to assess Lasnik's treatment of pronouns without a tremendous amount of preliminary, and fundamental, work. However, the argument I wish to advance against Lasnik's position will exploit only the most unchallengeable property of the distinction between what belongs to grammar and what belongs to pragmatics. For it seems indisputable that if certain truth-relevant features of the interpretation of any utterance of a sentence type are held to depend upon the context in which that utterance is made, then it will not make any sense to enquire into the truth value of the sentence type, considered independently of a particular context of utterance. Since Lasnik holds that the reference of all (non-bound) pronouns is determined by pragmatic factors—'considerations relating to situation, communicative intention and the like'—he must hold that it does not make any sense to enquire into the truth value of the sentence 'John loves his mother' considered independently of any particular context of utterance; this is so even when the interpretations of the expressions 'John', 'loves', and 'mother' are given. This is the only property of a pragmatic explanation of co-reference on which I need to rely. Relying on it, I want to show that Lasnik's pragmatic theory of co-reference precludes any explanation of the connection between pronouns in his unified category (*i*) + (*ii*) and pronouns in category (*iii*), and thus treats it as an accident that the same expression is used in sentences like (3) and (4).

The best way to see the difficulty for the pragmatic theory of co-reference is to attempt to apply the natural, and perfectly general, method of unification which I have ascribed to Frege. We know that 'Every man loves his mother' is true iff every man satisfies '( ) loves his mother', and, using the Fregean notion of satisfaction, we know that an arbitrary object x satisfies this predicate iff, interpreting 'β' as referring

to x, the sentence '(β) loves his mother' is true. But at this point we are stopped, for it does not make sense, on Lasnik's view, to enquire into the truth value of a sentence of the form '(β) loves his mother' independently of information about a particular context of utterance, and this is so even when the interpretation of the name 'β' is fixed. It is, of course, true that the original quantified sentence will be uttered in a context, and facts about that context can be used to determine the interpretation of context-dependent or ambiguous expressions in the substitution instances. But these facts will enable us to settle upon a preferred interpretation of a given expression which is constant in all the substitution instances; there is no way these facts can determine a different referent for the pronoun in each substitution instance. We could attempt to say that x satisfies the predicate iff there is *some* possible context of utterance in which the sentence type '(β) loves his mother' could be truly uttered, but then we will certainly get the truth conditions of the quantified sentence wrong. For if there is a context of utterance in which Harry is salient, and in which I can refer by the pronoun *his* to Harry, then, if John loves Harry's mother, but not his own, I can truly utter the sentence 'John loves his mother', so that John will satisfy the complex predicate despite the fact that he is a counter-example to the claim made by the quantified sentence.

Lasnik himself makes no attempt to explain the connection between the pronouns in his unified category (*i*) + (*ii*) and bound pronouns; he reserves bound pronouns for an appendix to the main article in which he states that 'the relationship [between antecedent quantifier and bound pronoun] should be characterized as that holding between a quantifier and the variable it binds',[20] and he leaves matters there. It should now be clear that this feature of Lasnik's treatment is not an accidental defect of the presentation of his ideas, but an immediate consequence of those ideas themselves. Strictly, I have only considered the unavailability of the Fregean way of discerning a connection to one who holds a pragmatic theory of co-reference, but the point holds quite generally, since the alternative (Tarskian) mode of

[20] Lasnik, op. cit., p. 18.

discerning the connection between devices in singular and quantified sentences is even less compatible with Lasnik's views.[21] The point should be obvious. For it seems clear that there is no common semantic principle explaining the behaviour of pronouns in categories (*i*) and (*iii*), and this is obviously unaffected by the inclusion of members of category (*ii*) in category (*i*).

It is the price of being able to recognize the obvious semantic connection between pronouns with singular and quantified antecedents that we distinguish semantically between pronouns used as devices of co-reference, and pronouns whose reference is secured in some other way, e.g. deictically. But this is not a complication of the same kind as we have just pointed to in Lasnik's treatment, and which therefore must be thrown into the balance and weighed against it. In Lasnik's case, the complexity results from a failure to discern a connection between two obviously connected capacities. The connection can be shown empirically by demonstrating the speakers' capacity to understand new sentences—those which contain, as bound pronouns, expressions which had not explicitly figured in that role before—a capacity which presumably relies upon their familiarity with sentences in which the expression has a singular term as antecedent. But to distinguish between the functioning of pronouns in categories (*i*) and (*ii*) is not to bifurcate a single capacity in the same way. Let us agree that to understand a pronoun as referring to an object mentioned in a previous conversation is to interpret the pronoun in a way which is not specifically secured by any rule of the language—it is simply a manifestation of one speaker's

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[21] I give an account of the Tarskian approach to quantified sentences in 'Pronouns, Quantifiers and Relative Clauses' (see above). If Frege can be said to take the role of a device in singular *sentences* as primitive, Tarski does the opposite by taking the role of devices in forming complex *predicates* as primitive. The Tarskian account of the role of pronouns would then be in terms of the impact they have upon whether or not a sequence of objects satisfies the predicate in which they occur; the same element of the sequence would have to be assigned to the pronoun as is assigned to this or that other position in the predicate. I say that this is not compatible with Lasnik's views because the Tarskian cannot even prevent the complex predicate '( ) loves his mother' from being attached to a referring expression (like *John*), thus providing a source of a kind not recognized by Lasnik for the sentence 'John loves his mother'.

general capacity to *make sense of* the acts (including the linguistic acts) of others. Now, I am suggesting that when the previous reference is within the same sentence as the pronoun (and subject to certain further conditions) the co-referential interpretation of the pronoun is secured, as one interpretation of the sentence, by a linguistic rule. Is this to fail to see a connection between connected capacities? Not at all; we are not obliged to postulate a different mechanism of understanding in the two cases, as though in one case a book labelled *Rules of the English Language* is consulted, while in the other case, it is the book labelled *How to Make Sense of One's Fellow Men*. It is just that we *describe* a propensity to interpret what speakers say as being in accordance with a rule of the language only under certain conditions; one of these conditions is when the interpretation of *other* utterances obliges us to ascribe semantic properties to sentence types considered independently of context.

Here we touch upon a point of general interest, for it becomes clear that we can use the interpretation of quantified sentences as a general guide in drawing the line between grammar and pragmatics. In order to illustrate this, let me go back to E-type pronouns. Given what I said in section 2, it might be tempting to hold that E-type pronouns are referring expressions whose reference is fixed by pragmatic factors. On this view, all that the grammar of the language tells us about the pronoun in the sentence (38):

(38) John owns some donkeys and feeds them at night

is that it can refer to any group of entities salient in the context; one very likely (but, from the point of view of the semantics of the language, in no way privileged) group will be the donkeys which John owns.[22] However, an objection can be made to this pragmatic theory which is exactly parallel to the objection I have just made to Lasnik's pragmatic theory of co-reference. For we also have to consider E-type pronouns in sentences like (39):

[22] I think that this is the proposal which B. H. Partee has in mind when she suggests in 'Bound Variables and Other Anaphoras' (unpublished mimeo, 1978) that E-type pronouns involve 'pragmatic' uses of pronouns. However, the reasoning in her sect. 2 is another argument to the same conclusion as I try to establish in the present section.

(39) Every villager owns some donkeys and feeds them
at night.

Now, it plainly does not make sense to ask which group of donkeys the pronoun in (39) refers to. Once the proper name *John* has been supplanted by the quantifier *Every villager*, there is no determinate answer to such a question. Hence, since it is not referring to anything in (39), a pragmatic account of E-type pronouns in sentences like (38) would leave this pronoun unaccounted for. But, once again, it is obviously wrong to see no connection between the use of the pronouns in (38) and (39), and to cast around for a new account of the pronoun in (39)—whatever that could be. Here is yet another facet of the general problem presented by devices showing up in both singular and quantified sentences, and it is susceptible of the same, Fregean, solution. Provided we give an account of the E-type pronoun in a sentence like (38), the pronoun in (39)—of which (38) is a substitution instance—will take care of itself. However, once again, the Fregean treatment presupposes that there is an interpretation of the pronoun in (38) on which its reference is determined by linguistic rule, and not by 'considerations relating to situation, communicative intention, and the like'. As in the previous case, the intention of the person who utters the quantified sentences is germane to the interpretation of that utterance, for we must know whether or not he uttered the pronoun as governed by the hypothesized rule rather than with the intention of referring to some salient group of donkeys. But if he did so, it is the rule which determines the reference of the pronoun in the relevant substitution instances; *their* reference cannot be determined by pragmatic factors, since pragmatic factors cannot determine the reference of a pronoun in a sentence whose interpretation we are considering independently of any particular context of utterance.

5 Other Difficulties in the Pragmatic Theory of Co-reference

Lasnik's thesis is that the grammar of English does not oblige us to draw any distinction between the uses of pronouns in categories (*i*) and (*ii*). Clearly we can make the objection

to such a thesis that there appear to be quite delicate syntactic restrictions upon when a pronoun can be used with the intention that it be understood to be co-referential with a given singular term—restrictions which have no parallel in the case of pronouns which are intended to be understood as making an independent reference. The restrictions concern the case in which the pronoun precedes the term with which it is intended to be co-referential; in general, such a use is felicitous only if the pronoun does not *c*-command the term.[23] For example, the pronoun in the sentence (40):

(40) He is happy when Oscar is in love

cannot felicitously be used with the intention that it be understood as co-referential with the term *Oscar*. The restriction is not pragmatic; (40) confronts the hearer with the same task of deciding upon a referent for the pronoun, and one highly salient candidate is Oscar. Examples like this make it appear that there are grammatical rules of the language which specifically regulate the occurrence of pronouns in category (*ii*), and hence that the grammar of the language obliges us to distinguish between pronouns in categories (*i*) and (*ii*). In this final section, I want to see whether this impression is correct, and thus to see whether the very general argument of section 4 can be reinforced by an argument resting upon details of English grammar. (Simply to have some notation, let me use the symbols *he*→, ←*she*, ←*them*, etc., to represent occurrences of pronouns which are intended to be understood as being co-referential with some succeeding or preceding singular term, and *he*↗, *them*↗, etc., to represent occurrences of pronouns which are intended to be understood as making references of all other kinds.)

Of course, Lasnik is aware of the apparent distinction the grammar of language draws between ←*he* and *he*↗, and he attempts to render the facts consistent with his unification of the categories to which ←*he* and *he*↗ belong in the

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[23] Actually, Lasnik uses the notion *kommand* defined as follows: 'A kommands B if the minimal cyclic node dominating A also dominates B.' Whether we should formulate the relevant restrictions using the notion of *c*-command or of kommand is not a matter on which I am competent to pronounce, and is anyway not relevant to the disagreement I go on to express. I have retained the notion of *c*-command to avoid irrelevant complication.

following way. It is true, he says, that on the co-referential interpretation (40) infringes a rule of grammar, but the rule is not one which is specifically concerned with the possibilities of pronominal co-reference. The rule which (40) infringes is more general, since it prohibits co-reference between *any* two noun phrases occupying the position which *he* and *John* respectively occupy in (40), unless the latter position is occupied by a pronoun. Lasnik observes that we are inclined to take the two *Oscar*s in the sentence (41)

(41) Oscar is happy when Oscar is in love

as referring to different people, and his idea is to bring this observation under the same rule which explains the infelicity of (40). The final formulation which he offers of the relevant rule of *Non-co-reference* is (42):

(42) If NP_1 precedes and *c*-commands NP_2 and NP_2 is not a pronoun, then NP_1 and NP_2 are disjoint in reference.[24]

Now if the infelicity of (40) is indeed explained by this rule, then no argument against Lasnik's position can be based upon it. (42) is a rule of grammar which, in so far as it mentions pronouns at all, can be regarded as dealing with a unitary category, to which ←*he* and *he*↗ both belong.

Before proceeding, we must take note of an extraordinary feature of the rule which Lasnik formulates and defends: the notion of *disjoint reference* which it uses is a purely extensional one. Two NPs are co-referential in the sense of the rule (i.e. are not disjoint in reference) iff, as a matter of fact, they refer to the same thing. Hence, the rule predicts that a simple sentence of the form $NP_1 - Verb - NP_2$ is *ungrammatical* if it so happens that NP_1 and NP_2 refer to the same thing. (When I use the term *ungrammatical* in the context of Lasnik's views, I mean simply 'infringes a rule of sentence grammar'. The rule may of course be a semantic one.) This is not an error in formulation; Lasnik explicitly considers the objection that his rule makes all true identity statements ungrammatical and responds to it not by holding it to be based on misunderstanding, but by espousing an indefensible metalinguistic

[24] See fn. 23.

theory of identity statements.[25] But the absurdities to which a purely extensional rule of Non-co-reference gives rise are not limited to identity statements, and so no theory of identity statements, however eccentric, can repair the damage. For example, Lasnik must hold that the simple sentence (43):

(43) This man is the same height of Stalin

(said, perhaps, as part of an investigation into the man's identity) is not true, but rather *ungrammatical* if *this man* does in fact refer to Stalin. But even beyond this, Lasnik's theory predicts a difference in our reactions to the sentences (44) and (45) when *his↗* and *this man* are both being used to refer deictically to Stalin.

(44) Stalin signed this man's papers.

(45) Stalin signed *his↗* papers.

According to Lasnik's rule, (44) is ungrammatical while (45) is not.

It is not necessary for Lasnik to embrace these views. It *is* necessary that his Non-co-reference rule should not be specifically concerned with the co-reference possibilities of pronouns, and hence that it include *Oscar–Oscar* pairs in addition to *Oscar–his* pairs. But it is *not* necessary that it embrace *Cicero–Tully* pairs as well. Lasnik does say at one point[26] that 'it is possible that the notion of coreference in this rule and elsewhere in this discussion should be replaced with that of intended coreference', and such a change certainly seems indicated. Actually formulating the required notion is not easy, since one who sincerely utters an identity statement does intend that the two terms be co-referential. However, I shall suppose that it can be done—that there is some notion which can apply both to a pair of expressions one of which is a proper name and the other of which is a pronoun which has that name as antecedent, and also to two occurrences of the same proper name. For I want to challenge the heart of Lasnik's position that there is a common source to the unacceptability of (40) and (41) when this relation of 'intended co-reference' holds between the two NPs in both sentences.

[25] Lasnik, op. cit., fn. 7.   [26] Lasnik, op. cit., p. 6, fn. 5.

Consider a very simple example of a sentence which, when the two names are intended to be taken as co-referential, infringes Lasnik's rule:

(46) Oscar loves Oscar's mother.

It seems to me doubtful that this sentence is ungrammatical at all. Here, oddly enough, Chomsky seems to agree. Considering the two sentences 'John is here, but will he shoot' and 'If John is here then he will shoot', he writes:[27]

In the latter case, and perhaps the former as well, substitution of *John* for *he* seems to me to impose disjoint reference. It seems that the rule applying here is not a rule of sentence-grammar, but is rather a rule assigning a higher degree of preference to disjoint interpretation the closer the grammatical connexion.

One reason for maintaining that the principle is not one of sentence grammar is that it also appears to apply to sequences of sentences; as Chomsky notes, substitution of *John* for *he* in (47) is difficult, if co-reference is intended.

(47) John is here. Will he shoot?

Another, perhaps better, reason is the fact that it is easy enough to find contexts in which repetition of the name has some point, and in which the implication of disjointness of reference is cancelled. For example, a logic teacher might say to a student:

(48) Look, fathead. If everyone loves Oscar's mother, then certainly Oscar must love Oscar's mother.

Or again, someone might reasonably say:

(49) I know what John and Bill have in common. John thinks that Bill is terrific and Bill thinks that Bill is terrific.[28]

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[27] Chomsky, 'Conditions on Rules of Grammar', fn. 37.

[28] To deem sentences like 'John thinks that John is ill' ungrammatical is to claim the existence of a significant limitation upon the expressive power of English. How are we to state John's possession of a 'non-self-conscious' belief that he may have about someone who is in fact himself, but whom he does not know to be himself?

Or again,

> (50) Who loves Oscar's mother? I know Oscar loves Oscar's mother, but does anyone else?

When the conversational concern is with those who satisfy the predicate '( ) loves Oscar's mother', there is some point in abandoning the familiar and less prolix way of saying that Oscar loves his mother which pronouns make possible, and uttering (46) instead. Whether or not we go all the way with Chomsky, and deny that the infelicity of (46) is grammatical in origin, it cannot be denied that the appropriate conversational setting vastly increases the acceptability of such sentences. However, we will find that nothing can be done to increase the acceptability of sentences which infringe the conditions upon when a pronoun can pick up its reference from an NP elsewhere in the sentence, and this constitutes fairly strong evidence that the explanation of the unacceptability of the sentences (40) and (41) is different.

It might appear that the right way to test the hypothesis that there is a single phenomenon underlying the deviance of (40) and (41) is to compare the discourses (51) and (52):

> (51) Everyone has finally realized that Oscar is incompetent.
> Even Oscar has realized that Oscar is incompetent.

> (52) Everyone has finally realized that Oscar is incompetent.
> Even he has finally realized that Oscar is incompetent.

However, the sentence which is supposed to provide the appropriate conversational setting unfortunately also provides an alternative antecedent for the pronoun, and the result is quite tolerable. (I shall return to this kind of discourse below.) To test the hypothesis we need a suitable conversational setting which does not provide an antecedent for the pronoun. For example:

> (53) Everyone here admires someone on the committee. Joan admires Susan, Mary admires Jane, and Oscar admires Oscar.

(54) Everyone here admires someone on the committee. Joan admires Susan, Mary admires Jane, and he admires Oscar.

Although to my ear (53) is tolerable, (54) is quite impossible, yet Lasnik's grammar cannot distinguish between them. Again, consider:

(55) Everyone eventually realizes that someone dear to them is incompetent. For example, Mary has realized that Fred is incompetent, Susan has realized that her daughter is incompetent, and Oscar has realized that Oscar is incompetent.

(56) Everyone eventually realizes that someone dear to them is incompetent. For example, Mary has realized that Fred is incompetent, Susan has realized that her daughter is incompetent, and he has realized that Oscar is incompetent.

These examples show that the unacceptability of a sentence like (40) is not due to its infringing a general rule prohibiting 'intended co-reference' between any two NPs related as the NPs are in (40). We get no closer to the truth by restricting Lasnik's Non-co-reference rule to pronominal co-reference, though that would undermine Lasnik's position. For a discourse like (52) shows that a pronoun can both precede and *c*-command an NP with which it is intended to be a co-referential—*so long as it does not pick up its reference from that NP*. To formulate the rule correctly, we need this idea of one term's *picking up its reference from* another. So far, we have considered rules which use a *symmetrical* relation between NPs, whether it is the purely extensional notion of 'referring to the same thing', or the notion of 'intended to be understood as referring to the same thing', which we supposed Lasnik could formulate.[29] But it seems that (40) infringes a rule which states when a term, normally a pronoun, can pick up its reference from another term—and this is an asymmetrical relation between the terms. To avoid confusion with the symmetrical relations, let us use the expression *t is referentially dependent on t′* to mean that *t* is

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[29] A relation R is symmetrical iff, whenever *a* is R to *b*, *b* must also be R to *a*.

to be understood by being taken to have the same reference as t'. Now, this relation of referential dependence is quite different from, though it entails, that of intended co-reference; while two occurrences of the proper name *Oscar* or two occurrences of the pronoun *you* may be intended to be co-referential, neither occurrence is referentially dependent on the other. In our discourse (52), while the pronoun is intended to be co-referential with the second occurrence of the name *Oscar* (since it is referentially dependent upon the first occurrence, which is itself intended to be co-referential with the second), it is referentially dependent upon the first occurrence of the name, and not the second.[30]

Using this notion, we can formulate the rule which (40) infringes as follows:

> (57) A term can be referentially dependent upon an NP if it does not precede and *c*-command that NP.

The precise formulation of the rule does not matter.[31] The important point is that a principle of grammar must be explicitly concerned with the relation of referential dependence between pronouns and antecedents. The grammar to which (57) belongs will have to provide a list of expressions which can be referentially dependent upon other expressions—it will include third person pronouns as well as pronominal epithets, but will exclude first and second person pronouns as well as proper names. It will have to explain the semantic significance of the relation of referential dependence, and will therefore have to recognize as one among

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[30] It seems clear that we must be able to speak of a pronoun's being referentially dependent upon one rather than another occurrence of a term. If we compare the discourses (i) and (ii),

(i) What do you mean, Oscar loves no one? He loves Oscar

(ii) What do you mean, no one loves Oscar? He loves Oscar

it seems clear that the second is less acceptable than the first, which can only be explained by allowing that the pronoun is picking up its reference from the previous rather than the subsequent occurrence of the name, and that (as is well known) it is easier for a pronoun in a subject position to pick up its reference from a term in subject position than from one in object position.

[31] In particular, I make no allowances for the fact that a pronoun which is to be referentially dependent upon a prior occurrence of a term which stands in a certain grammatical relation to it must be a reflexive rather than an ordinary pronoun, and I have consistently ignored the need for number and gender agreement.

other interpretations of a sentence like (3), that it is true iff John loves John's mother. Since it will also have to recognize that pronouns can be used to make independent reference to salient objects, the grammar must itself distinguish between ←*he* and *he↗*, and will treat a sentence like (3) as ambiguous—in the sense that interpretations can be provided for it which exploit different rules of the grammar.

So far, I have been concerned to show that Lasnik's grammar, which combines a pragmatic theory of the reference of all pronouns with a Non-co-reference rule, is not adequate. I have not yet examined the main argument he offers for his position. The structure of his argument is this: any grammar which incorporates such a rule as (57) must also incorporate a Non-co-reference rule like (42), but the latter rule will suffice, on its own, to reject all the ungrammatical sentences. Lasnik states his argument succinctly in response to a suggestion of Wasow. He considers the sentence (58),

(58) I told him that John was a jerk

which he claims is ungrammatical when *him* is co-referential with *John*, and says:[32]

True, his [Wasow's] anaphora rule will not apply in (58). But Wasow explicitly stipulates that 'the failure of two NP's to be related anaphorically does not entail that they have distinct referents'. Here again, no provision is made for disallowing 'accidental' co-reference. I argued earlier that regardless of whether there is a pronominalization transformation or an interpretive co-referenced rule, a non-co-reference rule is required to account for the ungrammaticality of such examples as (58). In fact, I concluded that both types of co-reference devices can be dispensed with . . . and that the non-co-reference rule cannot be dispensed with.

We have already seen considerable deficiency in Lasnik's claim that a Non-co-reference rule *suffices* to account for the grammatical sentences, but we are now in a position to see what is wrong with the argument that is supposed to establish the *need* for a Non-co-reference rule.

I understand Lasnik's idea to be this. Any grammar with a co-reference rule like (57) will have to acknowledge the existence of pronouns used to make an independent reference,

[32] Lasnik, op. cit., p. 13.

and hence will have to allow that a sentence like (58) might involve such a use of the pronoun. And such a pronoun can be used to refer to anything. Thus, unless it is explicitly prohibited by a Non-co-referential rule, one possible interpretation of (58) will be that on which *him* refers to John, i.e. is co-referential with *John*. (This is what Lasnik means by 'accidental co-reference'.) But, according to Lasnik, such a use of the pronoun will result in an ungrammatical sentence.

This argument seems to me to rest upon a confusion between the three notions associated with the term *co-reference* which we have been at pains to distinguish. The sentence (58) is ungrammatical if, *and only if*, the pronoun is intended to be *referentially dependent* upon the later occurrence of the name *John*. Since our rule (57), and Wasow's parallel principle, expressly prohibit such dependence, there is no possibility of such an interpretation of the sentence being declared acceptable. Now, alternatively, the pronoun in (58) may be used to make a reference to John, but one which is independent of the occurrence of *John* in (58). There are two cases to consider, but neither of them results in an ungrammatical sentence, which must then be excluded by a Non-co-reference rule. In the first case, suggested by the notion of 'accidental co-reference', the pronoun is used to make a reference, possibly deictic, to a salient individual who turns out to be John. In this case, *him* and *John* in (58) are co-referential in merely the extensional sense, and the resulting utterance is in no way deviant. Another possibility is that the pronoun stands in the relation of intended-co-reference with *John*, although not referentially dependent upon it. This would be the result if the pronoun was referentially dependent upon some prior occurrence of the name *John* which itself stands in the relation of intended-co-reference with the occurrence of the name *John* in the sentence. Here again, strict ungrammaticality does not result, as can be seen from the discourse (similar to (52)):

(59) What do you mean John loves no one?
     He loves John.

Strict ungrammaticality is produced when and only when the

pronoun is intended to be referentially dependent upon that occurrence of the name which it precedes and *c*-commands. And (57) blocks any such sentence.

I have discussed Lasnik's argument in order to illustrate the importance of keeping in mind the difference between the three notions of *co-reference* that we have distinguished. To give one final example of the necessity for clarity on this matter, let me show how a major problem in the literature on anaphora dissolves when one attempts to formulate it in the vocabulary I have proposed. I shall let Lasnik introduce the subject.[33]

I turn now to a complex phenomenon hinted at in Jackendoff and Postal and discussed at length in Wasow. Wasow points out that there is no reading of (60) on which the three italicized NP's can all be understood as co-referential.

    (60) The woman *he* loved told *him* that *John* was a jerk

However, it appears that independently, *he* can be co-referential to *him* and *he* can be co-referential to *John*:

    (61) a. The woman *he* loved told us that *John* was a jerk
         b. The woman *he* loved told *him* that we were all jerks.

Lasnik goes on to say that a grammar needs a Non-co-reference rule to exclude the impossible reading of (60); without it, the reading would be allowed 'because of the transitivity of co-reference'.[34]

Let us formulate this supposed problem using the notion of referential dependence. We start from the fact that there is no reading of (60) on which both *he* and *him* are referentially dependent upon *John*—presumably because there is no reading at all on which *him* is referentially dependent on *John*, as is predicted by (57). (61a) shows us that the first pronoun can be referentially dependent on *John*, and (61b) shows us that the second pronoun can be referentially dependent upon the first pronoun, or, indeed, conversely. Construed in the first way, (61b) can be represented as (62):

    (62) The woman he↗ loved told ←him that we were
         all jerks.

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[33] Ibid., p. 11.   [34] Ibid., p. 12.

Construed in the other way, it can be represented as (63):

(63) The woman he→ loved told him↗ that we were
all jerks.

Presumably what matters for the supposed conundrum is that there exists the reading we have represented as (62), for then we have it that the first pronoun in (60) can be referentially dependent upon *John*, and that the second pronoun can be referentially dependent upon the first pronoun. Does it follow that the second pronoun can be referentially dependent upon *John*? Certainly not. Examples (61a, b) did not establish the possibility of the *simultaneous* dependence of the first pronoun on *John*, and the second pronoun upon the first. On the contrary, when we suppose the second pronoun to be referentially dependent upon the first, we suppose that the first pronoun is making an independent reference, and, thus construed, it cannot be referentially dependent upon anything. Therefore, when we formulate the problem with the notion of referential dependence, and when we make the natural assumption that if t is referentially dependent upon t', then t' cannot be referentially dependent upon anything, the problem simply disappears.[35]

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[35] It has been suggested by a reader that my notion 't is referentially dependent upon t'' is equivalent to Chomsky's notion 't is an anaphor whose antecedent is t''. This cannot be so for two reasons. First, Chomsky endorses Lasnik's pragmatic theory of the reference of (supposedly co-referential) pronouns, and, on that theory, it is not clear that it makes sense to speak of a pronoun's picking up its reference from one rather than another occurrence of a singular term, both of which serve to render their referent salient. Second, and more importantly, Chomsky speaks of quantifiers as antecedents of bound variables, when the relation of referential dependence is out of the question.