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Agreement as a Semantic Phenomenon

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1. Introduction

Within what we might call non-abstract theories of syntax such as GPSG and certain versions of Categorical Grammar, a good deal of recent work has adopted what we will refer to as the lexical entailment theory of control for an Equi-type sentence like (1):

1. John wants to win.

This theory embodies two major premises. The first is that the complement of an Equi verb is, in the syntax, a plain VP. The second is that this complement is not interpreted propositionally, but rather, denotes a property. Hence an Equi verb like *want* denotes a relation not between individuals and propositions, but rather between individuals and properties. The fact that *John* in (1) is the "understood subject" of *to win* is simply a fact about the meaning of *want*. A subject controlled Equi verb is one which entails something about the individual denoted by its subject having the property denoted by its VP complement. We will assume this view of control here; for discussion, see, for example - Dowty (1978, 1982, 1985), Chierchia (1984a, 1984b), and Chierchia and Jacobson (1985).

The lexical entailment theory of control has been quite successful in accounting for the semantics of Equi sentences. But what is much more problematic is the well-known fact that a controlled VP agrees with its understood subject in a variety of features such as person, number, and gender. This is illustrated by the familiar kinds of English facts in (2), and Italian facts such as those in (3):

2. a. The man wants to wash himself.
b. *The man wants to wash herself.
3. a. Maria ha persuaso Luigi a stare attento.
Maria-fem. persuaded Luigi-masc. to be attentive-masc. sing.
b. *Maria ha persuaso Luigi a stare attenta.
Maria-fem. persuaded Luigi-masc. to be attentive-fem. sing.

The fact that embedded VPs show this kind of agreement with their understood subjects is - of course - traditionally taken to be one of the strongest pieces of evidence for a sentential analysis of Equi complements.

The usual line here is that however subject-VP agreement is handled in the simple cases, this will automatically extend to Equi complements if these have syntactic subjects (possibly a PRO) at some level of representation and

if some principle ensures that the features of the controller match those of the embedded subject. (This second "if" is actually a rather big one, to which we return at the end.) But in any bare VP theory it is not at all obvious how to extend the normal subject-VP agreement apparatus to the case of embedded VPs.

There are, then, two classes of solutions which have been proposed. The first assumes that agreement is a syntactic phenomenon, and the tack is to provide some mechanism to directly ensure matching between the features of an embedded VP and those of its understood subject. We will use the term Control Agreement Principle in a very general sense to refer to any principle which is posited to ensure this matching.

The second tack is to treat agreement as a purely semantic phenomenon. This can be implemented in several ways; to pick one, let's say that in a simple subject-VP agreement case like (4) the VP *washed herself* denotes a partial function, and the denotation of the subject is not in the domain of this function (hence the value is undefined):

4. *The man washed herself.

A semantic account of (4) will automatically extend to an embedded VP as in (2). In (2b), for example, the embedded VP likewise denotes a function defined only for certain kinds of objects, and again the denotation of *the man* is not in the domain of this function. But since the meaning of *want* entails something about the individual denoted by its subject having the property denoted by its VP complement, this will be deviant for the same reason that (4) is. Semantic accounts of agreement have also been urged by Lapointe (1980, 1983), but we should be careful to distinguish true semantic accounts of agreement from those such as Barlow (1988) and Pollard and Sag (1988), in which agreement properties of verbs are *motivated* by the semantics of the verbs individually but in which gender marking still exists in the syntax and in which syntactic mechanisms similar to the Control-Agreement Principle are still invoked. By a *pure semantic account* of agreement, we mean one in which no mechanisms of the linguistic theory at all are involved in linking an agreement controller to the agreeing form.

Our purpose here is to argue for a semantic solution. First we will suggest that a CAP - regardless of its exact formulation - simply cannot capture in a simple way the appropriate generalizations concerning agreement of embedded VPs. Now this in itself does not mean that agreement must be treated semantically, for one might instead take this as evidence against the lexical entailment theory of control, and for a sentential analysis. Thus, in the remainder of this paper we will argue that the apparatus needed for a semantic treatment of agreement is independently motivated.

2. Problems with the Control Agreement Principle

We first turn to the problems with the Control Agreement Principle approach. The first potential problem for such an approach lies in the need to capture the generalization shown in (5):

5. The agreement controller for an embedded VP is always the NP which is its understood subject.

In other words, we would like a single principle to predict the correct agreement controller in all of the cases below:

6. a. John tries to wash himself.
b. John promised Mary to wash himself.
c. John persuaded Mary to wash herself.

To illustrate why this is a non-trivial task, let us take as our point of departure the Control Agreement Principle of Gazdar et al (1985). As discussed in Jacobson (1987), this version of the CAP does not in fact succeed in unifying these cases - agreement in (6a) and (6b) is handled by a separate principle from agreement in (6c). It is thus an accident under this view that the principles of grammar happen to conspire to yield the generalization in (5).

Now this can be partially remedied---as detailed in Jacobson (1987), the reason that Gazdar et al fail to collapse (6a) and (6b) with (6c) is not just because they adopt a CAP, but also because of the particular way that they handle lexical entries. Without going into the details here, let us simply say that there are various ways to build in the generalization stated in (5) if we take something like the view of lexical entries in Categorical Grammar, where the subject position is encoded into the lexical entry for a verb just as other complement positions are. To illustrate, let us use the notation suggested in Chierchia 1984: *try* is listed in the lexicon as shown in (7a), *promise* as shown in (7b), and *persuade* as shown in (7c). The idea here is that [i] ranges over the set of features relevant for agreement, and each control verb specifies which of its arguments will be the agreement controller:

7. a. *try*: (S/ NP)/(S/ NP) [i] [i]
b. *promise*: ((S/ NP)/(S/ NP))/NP [i] [i]
c. *persuade*: ((S/NP)/ NP)/(S/ NP) [i] [i]

Now of course if we leave it at this, we are simply building in the agreement patterns item by item, which is even less general than the Control Agreement Principle of Gazdar et al. However, with this apparatus, one can formulate some general constraint on the distribution of agreement features in lexical entries. The most straightforward way to do this would be to say that something like the statement in (5) is simply a part of grammatical theory. Notice that under the lexical entailment theory of control the notion of a "controller" is simply a property of the meaning of a lexical item. Hence, a principle like (5) is a constraint on the pairings of meanings and syntactic categories - it says that if a lexical item has a certain set of entailments associated with it then the agreement features must be distributed in a certain way. Now there certainly are principles like this which govern the pairings of meanings and syntactic categories. But these are usually tendencies only, and can have exceptions. A good example is languages in which lexical items assign idiosyncratic case to their arguments; this usually correlates to a high degree with semantic facts, yet there can be exceptions. But as far as we know the principle in (5) is absolutely exceptionless in all languages - and it is not clear why this particular principle on the pairing of meaning with syntactic category should have no exceptions. A slightly more indirect way to capture (5) is suggested in Jacobson (1987), and one can probably imagine other ways to do this, but we suspect that these will all ultimately be subject to this criticism.

It is also not clear how any version of the CAP could handle cases of

pragmatic control. For example, Bach (1982) and Ladusaw and Dowty (1988) argue that the controller for a purpose clause is determined pragmatically. Ladusaw and Dowty also argue that the controller of an infinitival relative is determined pragmatically. Thus notice that in the case of an infinitival relative, there need not even be an overt controller present:

7. Here is some wine to get yourself drunk with.

But of course there is still agreement here with the understood subject. Yet short of positing a PRO or deleted subject, there is no way to encode this into the syntax.

3. A Semantic Account of Agreement

All of these problems would disappear if agreement could be treated as a semantic phenomenon. Quite independently of the control problem, it has been argued in a variety of places that Number Agreement in English is indeed a semantic phenomenon, see, for example, Bartsch (1973), Scha (1981), Link (1983), Hoeksema (1983), and Lasnik (1988), the last of which in particular overcomes a number of obstacles to treating number semantically. English (natural) gender was given a formal semantic treatment in Cooper (1974), and Lapointe (1980, 1983) has proposed that agreement phenomena in general be treated semantically. The obvious problem, of course, for a semantic account of agreement lies in languages which show gender agreement but which also have grammatical (non-natural) gender. There is, however, a coherent way to treat this agreement as semantic, and the tack we will take follows up on a suggestion which has been made from time to time with respect to the treatment of deictic pronouns - this suggestion is found in Johnson (1985), Dowty (1988), Pollard and Sag (1988), and others. Our proposal relies on the fact that language itself is a part of the world. Thus, one of the real-world properties of, say, chairs, is that the English word conventionally used to denote this class of objects is *chair*, and that the French word is *chaise*. So, we will accept the traditional assumption that nouns are idiosyncratically marked with syntactic gender features. But it follows from this that one of the actual properties of chairs is that the French word conventionally used to denote this class of objects is marked with the feminine gender feature. Take, then, a case like (8):

8. a. La chaise (fem) est belle (fem).
b. *La chaise (fem) est beau (masc).

What we would say is that the adjective *beau* denotes a function which is defined only for those objects with the property that the most salient common noun that would be chosen to refer to them in the present context of utterance² has the masculine gender feature. In this way, we can retain the notion that gender features are syntactic, but agreement can still be treated as semantic.

While it may seem unusual to treat facts about language as indirect properties of objects, there are considerations that support this view which have been noted from time to time. The most persuasive is the well-known fact that pronouns must have the gender feature appropriate to their intended referent, even if their antecedent is in an earlier sentence or if the pronoun is deictic and has no linguistic antecedent at all. So, for example, a French speaker pointing to a chair would say (9a), and not (in normal circumstances) (9b):

9. a. Elle (fem.) est belle.
b. ?*Il (masc.) est beau.

As it seems absurd to hypothesize that such pronouns have "unpronounced" linguistic antecedents, lurking about somewhere in the discourse context, we see no way to account for this kind of matching, particularly the purely deictic use, without acknowledging that a property of an object is what noun could appropriately refer to it---that facts about language are part of the real world properties of objects.

However, a recognized objection to this "semantization" of grammatical gender is that cases exist in these languages where two nouns of different genders are equally appropriate to refer to an object, hence the above account would seem to predict that a pronoun of one of these genders could follow a noun of the other gender, yet both refer to the same object, or that deictic pronouns of two genders could be intermixed. But as is well-known, this is not the case; though German has the neuter noun *Auto* and the masculine noun *Wagen*, both commonly used to refer to automobiles, one still cannot say (10a) or (10b):

10. a. *Ich kaufte ein neues Auto; Er, war teuer.
"I bought a new car (neut). It (masc) was expensive"
b. (*pointing to a car*): *Es, war teuer, aber er, fährt schnell.
"It (neut) was expensive, but it (masc) runs fast."

And as has also been pointed out, one can normally use only a pronoun matching the gender of the most recent noun referring to the same object as the pronoun, not an earlier noun of a different gender which refers to that same object, as Landman's (1986, 102-103) Dutch examples show:

11. *De fiets staat in de tuin. Hij is kapot. Jan zet het rijwiel op 'n kop, voorzichtig, want het heeft handremmen.*
"The bicycle (masc) is standing in the garden. It(masc) is defective. Jan puts the bicycle(neut) upside down, carefully, because it (neut) has brakes."
12. **De fiets staat in de tuin. Het is kapot. Jan zet het rijwiel op 'n kop, voorzichtig, want hij heeft handremmen.*

Nevertheless, we believe that facts such as these are not really an obstacle to a semantic account, because these facts can be shown to follow from very general, independent pragmatic principles of linguistic reference.

It has been noted, in a variety of situations, that the existence of a conventional means of marking coreference in a language will often generate an implicature of disjoint reference in sentences where the coreferential marking could have been used but was avoided. The best-known example of this is of course the near-complementary distribution, in many languages, of obligatorily bound ("anaphoric") pronoun-antecedent configurations and cases where an ordinary pronoun ("pronominal") can corefer. Though some grammatical theories have attempted to incorporate such disjoint reference conditions as principles of grammar, this tack ultimately fails because special pragmatic circumstances can eventually be found where coreference is possible even in these supposedly "disjoint" configurations; such disjoint reference principles are probably best regarded as pragmatic principles (Dowty 1980, Reinhart 1983), though highly systematic ones.

But even aside from these configurations, the repetition of a proper noun is normally inappropriate to refer to the same individual (13a), because, surely, the standard form (13b) exists for indicating coreference here:

13. a. ??John ate the squash, and John got sick afterward.
 b. John ate the squash, and he got sick afterward.

And again with definite descriptions, not only are two occurrences of the very same definite description normally avoided to achieve coreference,³ even using two *different* descriptions to pick out the same referent would usually be strange; even if the speaker knows that the hearer knows that the speaker's next-door neighbor is the only person in town who owns a 40-foot ladder, (14a) would be an odd discourse in most situations; (14b) is the normal way to say it:

- 14a. ??I saw my next-door neighbor on Sunday afternoon. The woman who owns a 40-foot ladder was painting her second-story windows.
 b. I saw my next-door neighbor on Sunday afternoon (,who owns a 40-foot ladder). She was painting her second-story windows.

Once again, this is not an absolute rule; in fact it's less rigid than the other cases above: the well-known exception this time is the epithet. But epithets *are* felt as exceptional: contentful ones (i.e. not *the idiot*, etc.) are found in special stylistic registers, require the hearer to know enough facts about the referent of the two NPs to recognize that the second *is* an epithet, and are perceived by speakers as being not the typical way to refer. Saying "Senator Metzenbaum arrives at noon today. The Ohio Democrat will make a speech at 2." is not the most colloquial way to speak; one puts a pronoun in the second sentence instead.

In a language having a grammatical gender system, cases where two nouns of different genders are both appropriate for referring to the same class of objects are relatively rare; more commonly, there is only one salient noun for referring to a class of objects, and thus one gender. (As has often been observed, a natural gender system in some sense seems to lie at the "core" of most or all grammatical gender systems--Indo-European genders are not named *masculine*, *feminine*, etc. fortuitously---and a natural gender system does of course partition its domain into disjoint sets, via "real" properties.) This situation permits gender marking on pronouns to serve as a kind of disjoint reference system in itself. If a feminine pronoun, for example, immediately follows a sentence with masculine, feminine, and neuter NPs in it, the hearer can immediately rule out the masculine and neuter NPs as possible antecedents; the antecedent must be the feminine NP, some other feminine NP in the discourse, or some deictically indicated object. Using distinct genders is not merely a failure to indicate coreference (as in the earlier referential examples), but an almost certain indication of disjoint reference.

As we have established now that (1) there is a tendency to assume disjoint reference whenever an obvious linguistic means for indicating coreference is being avoided, and (2) a contrast in grammatical gender is, moreover, normally an indicator of disjoint reference, it follows that (assuming our semantic account of gender) a cooperative, orderly speaker, when faced with a situation where pronouns of two different genders are appropriate to refer to an object, should pick one of the genders and use it consistently, as he otherwise risks misleading or distracting his audience unnecessarily. And by the same token, if there is a linguistic antecedent in such a case, the pronoun's gender should match the antecedent's.

As with the other principles above, one would not expect this one to be

absolute; and in fact it has been observed that in grammatical-gender languages the gender of a pronoun in a discourse may indeed deviate from that of its antecedent in certain cases, especially if widely separated from it. The most common change is for the later pronouns to take on the natural gender (i.e. sex or animacy) of their referent, instead of the grammatical gender of the antecedent.

Because of the problem of grammatical gender in anaphora, some writers have suggested that agreement features on pronominal anaphora be handled at the level of discourse representation (Landman 1986, 103) or at a level which is similar to discourse representation in being somehow "between" syntax and semantics (Barlow 1986, Pollard and Sag 1988). While this may seem attractive for some of the above cases, note that it does not in itself suffice for the gender-marked deictic pronouns (e.g. 9, 10b) that have no antecedent but must correspond to the gender of some appropriate non-occurring noun. As Pollard and Sag recognize (p. 254) a "pragmatic constraint" is also necessary: this makes reference to the existence of an appropriate noun for referring to the object, and what the noun's gender is---in other words, just what our proposal does.

Our point is therefore (1) a "pragmatic constraint" is required anyway for deictic pronoun gender under any treatment, (2) such a mechanism is capable of treating *all* gender agreement in pronouns (and other agreement), (3) hence one can---and, we argue, should---dispense with the intermediate level of gender-marked discourse referents entirely and adopt a semantic account uniformly.

3.1 Local vs. Non-Local Agreement

The phenomenon of grammatical agreement and the literature on it are both extremely broad, and we cannot possibly discuss all the potentially difficult cases for our approach in a paper of this scope. However, we should comment on one class of problematic cases and a possible variant approach. Pullum and Zwicky (1983) point out that, in Somali, NPs under certain conditions have the opposite gender marking from the expected one (e.g. feminine verb agreement for masculine subject), so-called "polarity" agreement; Lapointe 1980 points out that standard German is most naturally analyzed as having "disagreement" in its Determiner-Ajective inflections. While cases of this kind probably *could* be accommodated in the kind of semantic approach we have advocated here, it is not clear that it would be insightful to do so. But we note that these and almost all other cases we know of that would appear problematic for a semantic analysis⁵ involve "local" agreement, e.g. agreement of adjective with noun, determiner with adjective, verb with subject or object, etc. However, the semantic account seems to us unproblematic and appropriate for "non-local" agreement---predicate-adjective with subject, pronominal anaphora with antecedent, and all agreement in controlled subjectless complements. One thus might consider the possibility that local agreement is sometimes marked by syntactic rules, while non-local agreement is always semantic. To make this distinction more precise, making use of the terminology of categorial grammar, we could adopt a very simple version of "Keenan's Principle" ("Functors agree with their arguments", Keenan 1974) and say "a grammar may stipulate that the lexical head of a functor may agree with certain features of its argument category". (The restriction to "lexical head" insures that no proper sub-parts of a functor, such as reflexive pronouns within a complement inside a VP, may participate in syntactic agreement.) Though this is a syntactic agreement principle, it is quite simple and would avoid all the problematic features of the Control Agreement principles discussed above. Distinctions in agreement types similar to the one we make have been

proposed by Zwicky (1987) ("local" vs. "anaphoric") and Lapointe (1983) ("internal" vs. "external"), though these writers draw the boundary between the two types differently than we do. Because of the relative rarity of recalcitrant syntactic cases like the Somali ones, one should perhaps investigate the possibility that they arise as grammaticizations, in some sense, of semantic agreement, a kind of grammaticization not possible for non-local agreement.

4. Cases of non-syntactic agreement in English

Having briefly sketched how a semantic account of agreement would work, we turn now to data which we believe argues that English agreement *must* be handled by semantic means. The first piece of evidence centers on the *tough*-construction, and concerns the matching - or lack thereof - between the subject and the gap, as illustrated in (15):

15. John is hard (for me) to please ____.

These two must match in number, gender, and person; this is shown by a case like (16):

16. a. That man is hard to persuade ____ to shave himself.
 b. *That man is hard to persuade ____ to shave { himself, / themselves.

If such matching is a semantic, then the impossibility of (15b) will of course follow from its meaning. Quite apart from the matching problem, the semantics will have to be such that the subject of hard in (15) is the "understood object" of persuade, and hence it will also be the "understood subject" of the embedded VP. Thus in (15b) there is a semantic clash.

As detailed in Jacobson (1984), on the other hand, this matching is difficult to account for in the syntax under any base-generated (i.e., non-movement) analysis of the *tough*-construction. Notice first that this matching cannot be subsumed in a straightforward way under a CAP which is designed to ensure that an embedded VP has the agreement features of its understood subject. The reason is quite simple: what is at issue here is not the agreement features on the VP complement of the *tough*-adjective, but rather the features on the gap within this VP.

An alternative syntactic approach would be to try to account for person, number, and gender matching in (15) by the conventions used to ensure that an extracted *wh*-constituent matches the features on an extraction gap. This, for example, is essentially the solution proposed in Gazdar, Klein, Pullum, and Sag (1985).⁶ But Jacobson (1984, 1987) demonstrates that this leads to severe complications in the account of *wh*-extraction connectivity. And aside from these complications, what we will argue here is that it is a mistake to subsume feature matching in the *tough*-construction under the kind of matching found in *wh*-extraction, for in the latter case the matching requirements are much stricter. Notice first that a *wh*-word must match its gap in case, while the *tough*-construction permits case mismatch:

17. a. *Whom do you think is a nice guy?
 b. He/*Him is hard for me to please.

Even more strikingly, the subject of the *tough*-construction can disagree with the gap in major category, while this kind of mismatch is not

permitted in the case of *wh*-extraction.⁷

The demonstration of this hinges on the assumption that there is nothing analogous to the Rosenbaum NP --> S' rule, nor is there a rule like NP --> VP [Inf]. In other words, while S's and Infinitive VPs can have nominalized semantics in the sense of Chierchia (1984), they are not syntactically NPs. It is well-known that these constituents can appear in a variety of places where NPs cannot, as shown in (18) and (19):

18. a. I pray that it will rain.
 b. *I pray { that event, / a rainstorm.
 19. a. I am afraid that it will rain.
 b. *I am afraid { that event, / a rainstorm.

On the other side of the coin, Grimshaw (1982) has pointed out that there is a class of verbs which can take NP but not S' objects, even though these are semantically and pragmatically compatible with S'-type meanings. These verbs are shown in (20), and (21) shows that the problem is not a kind of selectional restriction violation:

20. a. This theory captures/reflects/expresses the fact that grammars are learnable.
 b. *This theory captures/expresses/reflects that grammars are learnable.
 21. a. That theory captures/expresses/reflects several things. One is that grammars are learnable.

Similarly, the verb *dislike* - in contrast to *like* - can take only NP objects, and not infinitives:

22. a. I like something. b. I like to win at poker.
 23. a. I dislike something. b. *I dislike to lose at poker.
 24. I dislike several things. One is to lose at poker.

Thus NPs can occur where S's and infinitives cannot, and vice-versa. This indicates that they are simply of different syntactic categories, and the contrasts above show that the distribution of these categories is (at least in part) a matter of syntactic category selection.

In *wh*-constructions, the "extracted" *wh*-word must be of the category which is allowed in the position of the gap:

25. *[NP What things] did John pray [S' ____]?

But the *tough*-construction allows this kind of major category mismatch:

26. [S' That grammars are learnable] is hard for any theory to capture/express/reflect [NP ____].
 27. [Inf To lose at poker] is hard to admit to disliking [NP ____].

Thus any attempt to syntactically account for feature matching in the *tough*-construction by subsuming it under the matching conventions for *wh*-constructions will need principles by which case and major category matching are overridden here. While such conventions could perhaps be formulated, it should be noted that the *tough*-construction is by no means unique in requiring number, gender, and person matching while permitting

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NOTES

- ¹ In the case of Pollard and Sag (1988), this claim is obscured somewhat by the fact that a key notion involved is the "parameter", a concept deriving from situation theory and situation semantics, where even today its status vis-a-vis syntax vs. semantics remains somewhat obscure. But their discussion makes clear that they view a parameter as an (abstract) syntactic construct that is "anchored" to its real-world referent; cf. pp. 251, 254.
- ² The most salient noun for referring to an object in one context may not be the same as in another; one and the same individual might be most appropriately referred to as a *bitch*, *dog*, *beast*, *pet*, *animal*, etc., depending on the nature of the conversation.
- ³ Two such occurrences of course can appear (i) where separated widely enough in a discourse that the first would no longer be a salient antecedent for a pronoun in position of the second, or (ii) where not widely separated but where a pronoun in the position of the second NP would have multiple possible antecedents not successfully disambiguated by the context. Again, the point is that the repetition of full identical NPs is appropriate for coreference just where pronominal coreference would *not* be completely felicitous.
- ⁴ Gennaro Chierchia and Fred Landman (personal communication) have pointed out more complicated cases of gender switch to us, in Italian and Dutch respectively. For example, some changes in Dutch move in the direction of the "unmarked" gender, not necessarily the natural gender. We are not yet sure to what extent our account as it now stands will handle such cases. This tendency to shift toward natural gender is compatible with our view if one admits the effects of sentence processing and memory: it is known that as time passes, one's memory for the actual linguistic forms heard in a sentence decays much faster than one's memory of the meaning

of the sentence. Since a switch from grammatical to natural gender concord is a shift from requiring the hearer to recall a "linguistic property" of the referent (but linked to the earlier discourse) to recalling a non-linguistic one, this would apparently make identification easier. A syntactic account of agreement would of course be just as compatible with these facts as ours is.

⁵We have no proposal to make here about the analysis of Greek and Icelandic case agreement.

⁶Actually, this is somewhat of an oversimplification in that Gazdar, Klein, Pullum, and Sag (1985) also attempt to collapse the conventions for feature matching in *wh*-constructions with the Control Agreement Principle. Hence, they formulate a single principle to account for agreement of embedded VPs, feature matching in *wh*-constructions, and feature matching in the tough-construction. For arguments against this approach, see Jacobson (1987).

⁷Hukari and Levine (1987) and Bayer (forthcoming) both provide conventions to allow for the case mismatch shown in (17) while still accounting in the syntax for the number, gender, and person matching shown in (15). Neither of these analyses, however, accounts for the fact that major category mismatch is also allowed here, nor do these solutions extend to the range of other constructions to be discussed below.

⁸Of course sentences like (33) have sometimes been taken as evidence for the existence of a reconstructed structure in which the constituent following *be* is substituted into the position of the gap. But this will wrongly predict that there should be major category matching here.

⁹One way in which this is an oversimplification centers on the Topicalization construction; the matching requirements found in this construction seem to be less strict than those found in *wh*-constructions, but still stricter than those found in the other constructions discussed above. An additional problem is that judgments vary considerably here. Thus, as pointed out in Jacobson (1984), some speakers allow case mismatch in the Topicalization construction, while others do not:

i. %Him, I think loves Mary.

As to major category mismatch, L. Horn (personal communication) points out that the following are better than would be expected if strict category matching were required:

- ii. a. ?That grammars are learnable, his theory captures.
- b. ?To lose at poker, I sure dislike.

SPECIFIERS, ADVERBS, AND WORD ORDER TYPOLOGY

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1. Introduction.

Most of the recent research in formal syntax, at least within the Government-Binding framework, has essentially been an attempt to account for the distribution of various types of arguments, especially NP's. Though some attention has been paid to the position of determiners and other specifiers, they have still gotten short shrift, and adverbs have received even less attention.

In this paper, I show that there are distributional parallels among clause-subjects, specifiers, and adverbials which can be captured by setting up a small number of principles and parameters. In section 2, I examine the fact that there is a cross-linguistic tendency for subjects, determiners, and clause-specifiers (such as modal adverbs and topics) to be the left of the clausal head. I conclude that languages must allow clause-specifiers to the left, and that languages are parameterized with regard to the position of subjects and determiners, in a way that predicts the typological patterns. In section three, I provide an explicit licensing mechanism for adverbs, and propose that the cross-linguistic distribution of all types of adverbs can be predicted from that of specifiers. Section four contains a summary and conclusion.

2. Specifiers and Subjects.

2.1. Subjects and Determiners. Following the program set out in Stowell 1981, I will assume that basic phrase structure is determined not by Phrase Structure Rules, but by broad principles such as head-peripherality of constituents (i.e. head-final or head-initial), direction of Case assignment, and direction of theta-role assignment (cf. Koopman 1983, Travis 1984). The latter two license various verb complements, for example. I will take specifiers to be licensed directly by features assigned at the X" level (Fukui 1986, Ernst 1988a).

Since Chomsky 1970, subjects have usually been taken as a kind of specifier. But if this is true cross-linguistically, given the standard assumptions of X'-theory, we cannot directly account for languages where subjects¹ and Dets have very different distributions. Now it is true that these two items are often parallel, as in the Slavic and Romance languages and in consistently head-final languages like Japanese

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48 papers were presented at the conference, including four by invited speakers: Mark Aronoff, "Some Senses of *Lexical*", Laurence Horn, "Morphology, Pragmatics and the Un-Verb", Barbara H. Partee, "Many Quantifiers", and Michael Tanenhaus, "Lexical Representations and the Parsing of Long-Distance Dependencies". 45 of the conference papers are included in this volume; Tanenhaus's paper was unavailable for inclusion, as were Carole Chaski's "Morphological Conditions on Binding Theory and Syntactic Change" and Beatrice Santorini's "Against a Unitary Analysis of All Verb Second Clauses in at Least Some Germanic Languages".

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Joyce Powers and Kenneth de Jong
Editors