

Some Theoretical Consequences of Dutch Complementizer Agreement

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cliticization, since the form ofstu is derived from ofst du by enclisis of the subject pronoun, followed by assimilation. The second person agreement marker -st appears on both the finite verb and the complementizer. The identical forms of the markers on the verb and the markers that show up on the complementizers has led some of the earliest writers on this phenomenon (e.g. Beckering Vinckers 1872) to suppose that the agreement is nothing but phonetic anticipation of the ending of the verb, in other words, some kind of speech error, rather than a grammatical device. However, even though the agreement in question is not obligatory in all dialects, it is much too common to dismiss it as a speech error, and furthermore, it would seem rather odd that this phonetic anticipation would occur in the dialects, but not in the standard language. Clearly, complementizer agreement is part of the grammar of many Dutch dialects, and not merely a performance phenomenon (cf. also Goeman 1980 for some remarks on this matter).

In this paper, I will not concern myself much with the nitty gritty details of the description of the various agreement patterns in the Dutch dialects. As a matter of fact, there is a remarkable variation in the paradigms of the complementizers in these dialects (cf. Goeman 1980 and the references in that paper). Instead, I will concentrate on some of the theoretical implications of the very existence of these phenomena for theories of agreement.

## 2. Theoretical Consequences.

The existence of inflection endings on complementizer may have some bearing on the question, in government and binding theory, what the status of the INFL node is in languages such as Dutch and German. It has been suggested by several linguists, e.g. Den Besten, that this node should be equated with COMP in these languages. The existence of inflections on complementizers would seem to be interesting prima facie evidence for such a position. However, I will not be concerned here with this issue, the relevance of which is strictly internal to GB theory, but, rather, with a problem of wider scope, one that seems to arise independently of the particular syntactic framework that one prefers to work in. More precisely, I want to address here the status of number agreement. It has been suggested by a number of people, including myself (cf. Hoeksema 1983), that number agreement between subject and predicate is an essentially semantic

phenomenon. Let me briefly summarize some of the arguments that have been given for this position. Consider for example the different behaviour of conjunctions and disjunctions of singular terms:

- (5) a. John and Bill are here.  
b. John or Bill is here.

The difference can easily be described in syntactic terms, but the deeper reason behind the fact that conjunctions agree with plural verbs and disjunctions with singular verbs must be of a semantic nature. If it were just a lexical idiosyncrasy of the English conjunction sign and that it induces plurality, and a lexical idiosyncrasy of the English disjunction sign or that it creates singular noun phrases out of singular terms, then one would expect to find languages where conjunctions are singular, but disjunctions plural. However, such languages do not seem to exist, a fact which is left unexplained by purely syntactic theories, such as for instance the Sag/Gazdar/Wasow/Weisler (1985) theory of coordination in Generalized Phrase Structure Grammar (GPSG). In this theory, the plurality of conjunctions is guaranteed by assigning different features to disjunctions and conjunctions, and a feature cooccurrence restriction saying that a noun phrase with the feature [AND] must always be plural.

The motivation for this feature cooccurrence restriction is clearly a semantic one. We can do away with it altogether, if we allow semantic filtering of syntactic structures. It is easy to see that plural predicates have semantic properties that set them apart from singular predicates. For example, so-called collective readings only occur with plural predicates. Consider for example the sentences in (6):

- (6) a. Every professor is writing a book.  
b. The professors are writing a book.

Example (6b) has a collective reading, according to which the professors are writing a book together, but this is not true of (6a).

There are also predicates that may occur only with a plural subject, because of their inherent collectivity:

- (7) a. Jack and Jill are together again.  
b. \*Jill is together again.

We can account for number agreement in semantic terms by distinguishing two types of entities:

individuals and groups. Groups may consist of individuals, or of other groups, but are not themselves individuals. Plural predicates, then, are predicates of groups. Consequently, they may be predicated of, for instance, the group consisting of Jack and Jill, as in example (7a) above, but not of individuals, such as Jill. This accounts for the anomaly of sentences such as (7b) above. In the same way, it makes sense to let singular predicates denote properties of individuals. This accounts for the acceptability of examples such as (8a), where a singular verb phrase is predicated of an individual and the anomaly of examples such as (8b), where a singular verb phrase is predicated of a group:

- (8) a. This book is finished.
- b. \*His books is finished.

For a formal elaboration of these ideas in terms of generalized quantifier theory, I refer to Hoeksema (1983) and Dowty and Brodie (1984). My goal here is just to give some support for the contention that number agreement between subjects and their predicates is an essentially semantic matter, which can be described entirely in semantic terms and that a separate syntactic treatment is redundant and lacking in explanatory power.

### 3. Propositions.

So far we have seen that there is reason to believe that number agreement between subjects and predicates is best analyzed in semantic terms. Now we must determine whether number agreement between subjects and complementizers can also be treated in such terms.

It turns out, that there are major problems for an entirely semantic account. According to conventional wisdom, complementizers combine syntactically with dependent clauses. Semantically, therefore, it makes sense to analyze complementizers as functions over propositions. However, on the level of propositions, it would seem that number distinctions are no longer available. In other words, it does not seem to be correct to make a distinction between plural and singular propositions. For instance, there is not necessarily a difference in interpretation between a sentence with a plural subject, such as (9a) below and one with a singular subject, such as (9b):

- (9) a. The boys each have a problem.
- b. Each of the boys has a problem.

In some semantic analyses of propositions, such as Montague's, propositions are analyzed as sets of possible worlds, more precisely, as the set of possible worlds in which the proposition is true. Such an analysis leaves no room, of course, for number distinctions. If there is no semantic distinction between propositions with plural subjects and ones that have singular subjects, then it will not be possible to account for number agreement between complementizers and the embedded clauses they introduce in terms of restrictions on the types of arguments that complementizer denotations take.

However, the Montegovian interpretation of propositions as sets of possible worlds, or sets of world-time coordinates, is by no means the only one around. It has been known for some time that this interpretation is inadequate for contexts of belief and other propositional attitudes. One may believe a proposition and yet not believe one that is logically equivalent to it. The standard possible-world semantics for propositions is not able to distinguish logically equivalent propositions, since they are true in the same worlds. To solve this problem, it has been proposed by some philosophers that propositions should have a richer structure than that of a set of possible worlds. For example, David Lewis, in his paper "General Semantics" (Lewis 1970: 201) proposes to "identify meanings with semantically interpreted phrase markers minus their terminal nodes: finite ordered trees having at each node a category and an appropriate intension". Such an approach to meaning would also make it possible to distinguish propositions with plural subjects from ones with singular subjects. However, useful though this may be for a theory of number agreement that is formulated strictly in semantic terms, I reject it as a general approach to meaning, because it relies too heavily on the syntactic structure of the expressions. It would render the notion "semantically equivalent" almost vacuous, since even such pairs of sentences as the ones in (9) would not be equivalent, because they do not happen to have the same syntactic trees. Similarly, a sentence in a VSO language could never express the same proposition as its translation into an SOV language.

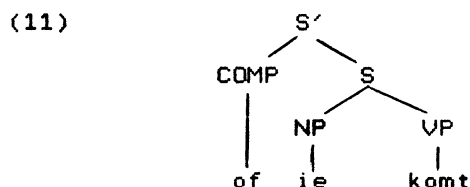
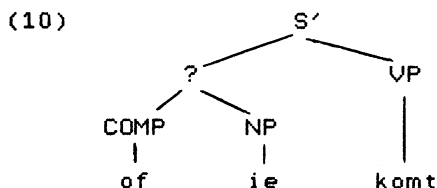
I do not see that a proposition expressed by either sentence in (9) could be an object of belief, or surprise, or any other propositional attitude, without the other one also being an object of belief, or surprise, etc. In other words, propositions should not be equated with the sentences they express. This point is by no means new, of course, and I only stress it here

in order to make it clear that the somewhat vexed status of propositions does not obviously allow us to build in number distinctions in the semantics of subordinate clauses.

So, to sum up, it appears that if complementizers are semantically functions that have the set of propositions as their domain, as suggested by their usual syntactic analysis, a plausible semantic analysis of number agreement is not forthcoming.

#### 4. An alternative.

Suppose now that we impose a slightly different syntactic structure on dependent clauses. Suppose, in particular, that complementizers do not combine with clauses directly, but rather with the subjects of these clauses. For example, the subordinate clause of *ie komt* could be assigned the structure in (10) below, rather than the more standard one in (11):



I have used the symbol '?' for the complementizer + subject combination, because there does not appear to be a standard name for such combinations. Although structure (10) may look rather unfamiliar, there is actually some evidence for it. This evidence is, that the subject cliticizes onto the complementizer. So, at least phonologically, the two elements must be a constituent, and rather than postulating any readjustment rules, the syntactic structure in (10) would directly account for this fact. Another suggestive piece of information, brought to my attention by Mike Brame, is the fact that in Arabic,

complementizers may case-mark subjects, suggesting a structural relation of the complementizer to the subject not unlike that of a transitive verb or a preposition to its object.

If subjects are directly combined with complementizers, then the latter must be interpreted as functions that take subject interpretations as their arguments, and then, clearly, we could make these functions sensitive to number distinctions, given our contention that these distinctions have a semantic basis. Therefore, a different syntactic analysis could make it possible to stick to a uniform semantic account of number agreement. However, there is a serious problem with the alternative syntactic analysis. While it may well be right for clauses with subject clitics, such as the subordinate clause in (1a), there does not seem to be much evidence for it in sentences without subject clitics. And recall from example (2b) that number agreement is not restricted to complementizers with encliticized subjects. Standard tests for constituency all seem to favour the usual phrase structure. Consider for instance c-command requirements on binding. As in English, subjects can be antecedents for reflexive pronouns in the Dutch dialects under consideration, so if the requirement that reflexives must be c-commanded by their antecedents holds, the alternative structure in (10) is likely to be incorrect, since according to that structure subjects do not in fact c-command direct objects or other positions in the VP.

Another test is provided by sentential anaphora. For this test, we assume that linguistic antecedents for anaphora form semantically coherent units. It is possible to show that subordinate clauses minus the complementizer form such units. Take a look at the following examples:

- (12) a. Indien het regent, betreur ik dat.  
 If it rains regret I that  
 "If it rains, I regret it"
- b. Toen hij ziek was, sprak iedereen daarover  
 When he ill was spoke everyone thereof  
 "When he was ill, everyone talked about it"

The pronominals *dat* and *daar* do not refer back to the adverbial subordinate clauses introduced by the complementizers *indien* "if" and *toen* "when", but rather to the propositions denoted by the bare Ss following them. Under the orthodox syntactic analysis this would not only make perfect sense, it would also be predicted. On the other hand, there do not seem to be pronouns which have complementizer-subject combinations as their

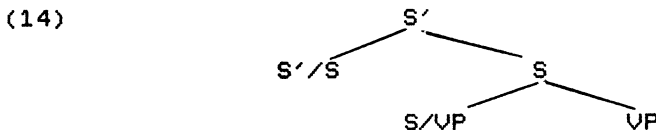
antecedents.

I do not want to suggest here that the tests I mentioned above are watertight. All grammars leak, said Sapir, and so do these tests. However, whatever evidence there is for constituency, seems to point in the direction of the orthodox analysis. Unfortunately, the most popular test for constituency, namely putting a string in front of the sentence, right before the finite verb, which always comes in second position in Dutch, cannot be applied here, since proper parts of subordinate clauses may not be fronted. Either the whole subordinate clause, including the complementizer, appears before the finite verb in the main clause, or nothing.

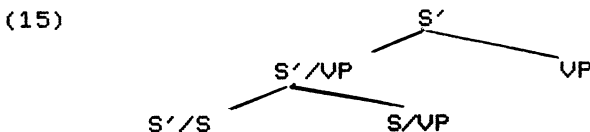
So it turns out that the semantic theory of complementizer agreement is not going to be saved by an alternative syntactic analysis of subordinate clauses. Before I close the book on this issue, however, let me address briefly a possibility that arises in categorial grammars that have rules of composition as well as cancellation rules. In particular, suppose that we adopt the following rule schemata for syntactic combinations:

- (13) Cancellation:  $A/B + B = A$   
Composition:  $A/B + B/C = A/C$

Following Steedman and other categorial grammarians, we can identify subjects (nominative noun phrases) with members of the category  $S/VP$ , and complementizers with members of the category  $S'/S$ . Using the cancellation rule schema only, we derive the classical structure:



The alternative structure is derived by using composition to combine the complementizer with the subject:



If we associate the application and composition rules semantically with function application and composition, respectively, and use a standard Montague-style semantics, the two structures will receive equivalent readings. Furthermore, if we adopt a semantic account of anaphora binding, such as the one proposed by Partee and Bach (1980), which does not rely on syntactic notions such as c-command, it is possible to sidestep the consequences drawn from the two tests for constituency I mentioned before. Using both application and composition rules in a categorial grammar might then seem to allow us to eat our cake and have it. On closer inspection, however, it turns out that there is still no way to make a semantic theory of complementizer feasible. If the lexical category for complementizers is  $S'/S$ , then they should be able to combine with any  $S$ , and, by composition, with any member of the category  $S/VP$ , including singular and plural noun phrases. Semantically, therefore, they must accept any kind of noun phrase denotation, no matter whether it is that of a singular noun phrase or a plural one. This makes semantic filtering of the type proposed for subject predicate number agreement impossible. I conclude, therefore, that an alternative syntactic analysis is not going to save the theory that number agreement is a strictly semantic phenomenon, even within the powerful framework of extended categorial grammar.

## 5. A syntactic account.

In the foregoing sections of this paper, I have tried to show that a strictly semantic analysis of number agreement between subject and complementizer faces severe problems. While it is not hard to force a semantic account, it does not seem to be attractive to do so, given that we must either make ad hoc assumptions about the nature of propositions, or use an essentially unmotivated syntactic analysis for subordinate clauses. Let us therefore consider the obvious alternative, a syntactic analysis of the agreement facts. It turns out that a particularly elegant treatment follows directly from the theory of agreement incorporated in GPSG (Generalized Phrase Structure Grammar, cf. Gazdar, Klein, Pullum & Sag 1985 for an exposition). In GPSG, agreement is expressed in terms of syntactic features. The distribution of these features is governed by a few general principles, the Head Feature Convention (HFC) and the Control Agreement Principle (CAP), given below in their informal, unofficial formulations:

(16) Head Feature Convention

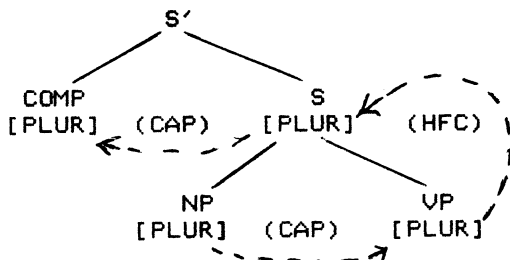
A head and its mother node carry the same (head) features.

(17) Control Agreement Principle

Controllers carry the same agreement features as their arguments.

These principles operate only when no other rules override them. Note that not all features are head features, but for our purposes it is not relevant to consider any other kind of feature (i.e. foot features). The Control Agreement Principle is an adaptation of Keenan's Functional Principle, which states that function expressions may be formally dependent on their arguments. The control relation is a generalization of the function-argument relation, whose nature will not concern us here (see Klein & Sag 1985 for discussion). Suffice it to say here that VPs control their subjects, and complementizers their sentential arguments. By the CAP, a plural subject induces the plural number feature on the VP. Since the VP is the head of S, the latter will receive this feature value from its daughter by the HFC. Finally, by another instantiation of the CAP, the complementizer gets the plural value for the number feature from its S argument. In a diagram:

(18)



The Dutch complementizer agreement facts follow, therefore, on a GPSG account, from the interaction of the CAP and the HFC. One crucial step in the argument is the assumption that the VP is the head of S, an assumption also made by Jackendoff (1977), but rejected by many other X-bar theoreticians. The agreement facts under consideration here might provide some support for the GPSG stand in this matter. I note in passing that

the account sketched here can be used without modification for those dialects that have person agreement in addition to or in lieu of number agreement.

The GPSG account outlined above requires a syntactic reflex of subject-predicate number agreement, since it is the feature value that is assigned to the VP by the subject that is handed over to the S-node which finally induces the same value for the number feature on the COMP-node. It is predicted therefore, that languages without number agreement between subject and predicate will not have number agreement between the complementizer and the subject either. Given that agreement on complementizers seems to be quite rare, it is hard to test this implicational universal, however.

## 6. Conclusions.

The main conclusion to be drawn from all of this is that number agreement is not a purely syntactic, nor a purely semantic phenomenon. This conclusion may sound familiar, and in fact it has been argued for before by Sadock (1983) and Morgan (1984). Sadock argues at length for the thesis that the semantic and syntactic components of the grammar may overlap, in the sense that both may determine the acceptability or nonacceptability of a given expression. When they make different predictions, sometimes the semantics wins (this is the phenomenon known as "constructio ad sententiam" in traditional grammar), and sometimes the syntax. I am convinced that number agreement is an essentially semantic phenomenon, to be fully understood only if an analysis in terms of meaning is given. However, it has become grammaticalized, just like many other semantic or pragmatic phenomena. Dutch complementizer agreement is a syntactic extension of the agreement system, which is no longer motivated by the original semantic distinctions that gave rise to the agreement system in the first place.

## Acknowledgements

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