

## STRESS AND SEMANTIC INTERPRETATION

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The formulation of semantic or syntactic rules that account for the often observed relatedness of what sentences are understood to mean to the placement of the focus stress in those sentences has traditionally presented a lot of difficulties. Where rules are proposed they generally do not mesh with other rules of grammar and tend to be highly unnatural in any case. More often, no rules are proposed and the relation under discussion is merely acknowledged as an unsolved problem.

Consider the following examples:

- (1)a. Like MOST bachelors, Fred likes chatty girls.  
b. Like most BACHELORS, Fred likes chatty girls.
- (2)a. John even believes that HE is tall for a Watusi.  
b. John even believes that he is tall for a WATUSI.
- (3)a. Einstein has visited Princeton.  
b. Princeton has been visited by Einstein.  
c. EINSTEIN has visited Princeton.

The association of stress with the presuppositions is well known. (1) through (3) show that these presuppositions can take very specific forms. (1) a., discussed by Kempson (1975), carries the presupposition that Fred is a bachelor (1) b. the presupposition that he is not. (2) a., discussed by Anderson (1972), presupposes that Watusis are small, (2) b. that they are big. Chomsky (1971) used the facts about sentences like (3) a. and b. to argue that some rules of semantic interpretation must depend on surface structure, noting that the passivized version b. does not carry the presupposition that Einstein is currently alive that a. does. McCawley subsequently showed that the correct generalization about these sentences involves stress, not passivization. For instance, c., with stress specifically indicated, behaves like b. rather than like a. should; it is just natural to assume that the stress falls toward the end of the sentence unless marked otherwise. Therefore, the presupposition is only incidentally associated with the use of the passive.

Often stress seems to be closely connected to the truth conditions of sentences. Dreske (1977) discusses sentences like (4) in which the alternative recommended is different in the two cases, depending on whether 'steal' or 'bicycle' is stressed.

- (4)a. George advised Susan to STEAL the bicycle.

- b. George advised Susan to steal the BICYCLE.

The most studied structures in this regard are a set of adverbs whose semantic scope seems to depend critically on the placement of stress when those adverbs occur in auxiliary position. Kuroda (1969) calls such adverbs 'attachment adverbs' and Jackendoff (1972) calls the associated phenomenon 'association with focus'. To take Jackendoff's example, (5) a. can be paraphrased as (6) a., while (5) b. must be paraphrased as (6) b. For (5) a. and (6) a. the uniqueness associated with 'only' seems to bear on 'his daughter' and for (5) b. and (6) b. on 'the bicycle'. 'Even' is another adverb commonly discussed in this regard.

- (5)a. John only gave his DAUGHTER a bicycle.  
 b. John only gave his daughter a BICYCLE.  
 (6)a. John gave only his DAUGHTER a bicycle.  
 b. John gave his daughter only a BICYCLE.

The task of accounting for association with focus has been a stumper. Kuroda's original account involved positing a syntactic movement rule which derived structures like (5) from structures like (6) a. and b. He then made the semantic interpretation dependent on underlying forms. Jackendoff chose to use surface rules of semantic interpretation which specifically referred to the stress placement as a determinant of semantic scope. The problems with these approaches are that they don't generalize to some analogous cases and that they conflict with some established assumptions about how syntax and semantics work. For instance, the sentences in (7) and (8) exhibit equivalent dependencies of interpretation on stress. But whereas (7) might be analyzed in terms of 'even' having a narrow semantic scope in each case, it is hard to provide an analysis whereby the scope of the conjunction 'because' has less than the embedded sentence in its scope.

- (7)a. Socrates only drank the HEMLOCK at dawn.  
 b. Socrates only drank the hemlock at DAWN.  
 (8)a. Socrates died because he drank the HENLOCK at dawn.  
 b. Socrates died because he drank the hemlock at DAWN.  
 (9) Jones can't even sell WHISKEY to the INDIANS.

Equally problematic are sentences like (9), described by Anderson (1972). Here the scope of 'even', the part of the sentence on which even's feature of surprise seems to bear, seems to be split between the focused constituents 'whiskey', and 'indians' or 'to the indians', even though these constituents don't together comprise a single constituent in any motivated description of surface or deep structure and don't function as a single unit of meaning. An adverb elsewhere in the language seems always to have a single semantic/syntactic unit in its scope.

Aside from the unsolved problems of analyzing the dependence of semantic interpretation on sentence stress for these and other structures --- something no one has ever succeeded in doing adequately --- there remain problems of justifying such rules in terms of naturalness, and integrating such rules into a general functional theory of how sentence stress works in natural language or English.

The suggestion I will make here is that THERE IS, AS FAR AS GRAMMAR IS CONCERNED, NO DIRECT RELATIONSHIP BETWEEN SEMANTIC INTERPRETATION AND STRESS ASSIGNMENT AT ALL. Rather the apparent relatedness of semantic interpretation to stress has a natural explanation which is incidental to the rules of language. This explanation has the general form of McCawley's demonstration I mentioned with regard to sentences like (3). It will be recalled that Chomsky's original observation related a presupposition to the use of the passive. McCawley showed that the correct generalization concerns not passivization, but stress, and that stress generally falls incidentally on a different constituent in the passive, resulting in the apparent dependence of the presupposition on the use of the active rather than the passive. Carrying this one step further, I advance first the proposition that the semantic interpretation of certain lexemes depends crucially on the potential contrasts (or what Fauconnier (1975) has called 'pragmatic scales') defined for specific contexts, and second the thesis that stress assignment is appropriate to certain contexts on the basis of these same kinds of potential contrasts. It follows that stress assignment and semantic interpretation are only incidentally related and that the complication incurred by trying to account for this phenomenon in terms of mysterious-looking ad-hoc semantic or syntactic rules need never arise.

The rules for assigning stress that I am presupposing are roughly those proposed by Bolinger in a number of works: in brief, the focal stress of a sentence falls on the constituent that carries the most information. It is natural to define information content in this sense, in terms of potential or expected contrasts. In a given speech context the set of possible expressions that might meaningfully contrast with a given constituent is constrained both by the topic of conversation, or theme, and by the plausibility that the resulting proposition is true given the hearer's knowledge of the world. This account is functionally highly motivated in ensuring that the main sentence stress will fall where the danger of misinterpretation would otherwise be greatest. Since stressed words are phonetically more distinct, misinterpretation tends thereby to be avoided. It follows that stress placement will point out where relevant potential contrasts exist.

This in itself is enough to begin to get a hold on sentences like (1). It is plausible that if Fred is a bachelor the oc-



Sentence (10) means one thing in a discussion about beautiful women, and another thing in a discussion of the depth and variety of Brigit Bardot's personal attributes. In the first case the contrast of 'pretty' with a set of expressions like those in (10) b. is understood. As a consequence (10) a. would carry certain entailments like Brigit Bardot is not beautiful. In the second case 'pretty' would contrast with a set of expressions like those in (10)c. As a consequence, (10) a. might carry the entailment that Bridget Bardot is dumb or mean, but probably not that she isn't beautiful. 'Even' works similarly, except that 'even' specifies not a unique member of a set, but picks out a highly unexpected member of a pragmatic scale. We'll confine our attention to 'only' because of the obvious time limitations. Notice that the account motivated for the analysis of 'only' is motivated independently of stress, since (10) a. may be used in alternative contexts with exactly the same stress pattern.

Consider however the more complex sentences (5) and (6) above. Remember that we are making the simplest assumption about the semantic scopes of 'only' in these sentences: that the constituent following 'only' in (6) a. is 'his daughter', that in (6) b. is 'the bicycle'. That in both a. and b. of (5), on the other hand, is the entire verb phrase 'gave his daughter a bicycle'.

Now, if what I have said about the semantic interpretation of 'only' is true, then the constituent which is in the scope of 'only' must potentially contrast with a set of other constituents of distinct meaning of the same kind. For (6)a. such a set might be (11)a. and for (6)b. such a set might be (11)b.

- |        |                                          |    |                                                 |
|--------|------------------------------------------|----|-------------------------------------------------|
| (11)a. | daughter<br>son<br>dog<br>wife<br>nephew | b. | bicycle<br>train set<br>new hat<br>lump of coal |
|--------|------------------------------------------|----|-------------------------------------------------|

If what I have said about stress placement is true, then the set of potential contrasts tends to be confined to the stressed constituent. For sentences of (6) the scope of 'only' contains not much more if any than the stressed constituent. (Notice, incidentally, that it is difficult to shift the stress out of the scope of 'only'. This is expected, since 'only' requires a contextually defined set of potential contrasts within its scope.)

Now, let's look at the sentences of (5). If what I have said about the semantic interpretation of 'only' is true then the same verb phrase which constitutes the scope of 'only' in each case must exhibit a set of potential contrasts with other verb phrases having distinct meanings, like those of (12).

- (12) gave his daughter a bicycle  
 went to the big game  
 ate his sandwich  
 initiated a hot game of tiddly winks.

But if what I have said about stress placement is true, then the potential contrasts will tend to be more narrowly confined to 'daughter' in a. and to 'bicycle' in b. This is by no means a contradiction, and in fact gives us the predictions we want.

The reason is that since the stressed constituent falls in the verb phrase in either sentence in (5), and each potential contrast with the stressed constituent corresponds to an equivalent contrast with the entire verb phrase. The given verb phrase will contrast with the verb phrase formed by replacing just the stressed constituent. For instance, the placement of sentence stress in (5) a. constrains the potential VERB PHRASE contrasts to a set like (13).

- (13) gave his daughter a bicycle  
 gave his son a bicycle  
 gave his dog a bicycle  
 gave his wife a bicycle  
 gave his nephew a bicycle.

Every member of (13) corresponds to a member of (11) a. and vice versa. Asserting the uniqueness of a member of (13) in satisfying the attribute designated in the rest of the sentence is logically equivalent to asserting the uniqueness of a member of (11) a. in satisfying the attribute designated in the rest of its sentence. Therefore, we predict the semantic equivalence of (5) a. and (6) a. IN THE CONTEXTS FOR WHICH THE INDICATED STRESS PLACEMENT IS APPROPRIATE. The account of (5) b. and (6) b. is exactly analogous.

In summary, the phenomenon of association with focus is not based on a relationship between stress placement and semantic scope at all. Rather, it is based on the way stress constrains potential contrasts (or vice versa) such that a one to one correspondence ensues between the potential contrasts with the stressed constituent and the potential contrasts with the larger constituent containing the stressed constituent. The result is that for structures whose semantic interpretation in speech contexts depends on the relevant potential contrasts defined in those speech contexts, certain differences in semantic scope are not accompanied by differences in semantic interpretation.

Consider some remaining sentences: (7) works much like (5). Since we are not relating association with focus to semantic scope, there is no obstacle to analyzing (8) as analogous to (7). For (8) the potential contrasts with 'hemlock' or 'dawn' define the set of potential contrasts with the entire clause which

'because' introduces. It seems to be clearly the case that expressions of causation depend for their semantic interpretation on a specific domain of potential contrasts. (Imagine the things that could have caused WWI, for instance, such as Bismark's prior policies, Kaiser Bill's impetuosity, the economic rivalry among European nations, Prince Ferdinand's assassination, the industrial revolution. The assertion that something is the cause of WWI will mean different things in different contexts.)

Explaining linguistic phenomena on a pragmatic basis always seems to result in a need to apologize for the lack of explicitness in the endeavor. This in itself is by no means an argument that the approach is wrong, only that pragmatic concepts are in greater need of exploration. In the case of the apparent association observed between semantic interpretation and sentence stress placement, I would claim that this is the only workable hypothesis we have. Not only is it plausible, but it provides a natural deductive explanation of what otherwise must seem to be a very mysterious phenomenon, and does this in terms of relatively simple and highly motivated rules of grammar.

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