

NEGATIVE-RAISING AND SENTENCE PRONOMINALIZATION

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Negative-raising, or not-transportation, is a minor rule which is undergone by a small class of exceptional verbs such as think, believe, expect, likely, seem, and want. (See for discussion Fillmore, 1963; Klima, 1964; Lakoff, 1965; R. Lakoff, 1968; G. Lakoff, 1968.) As a result of this rule, Neg is moved from an embedded sentence into the matrix sentence to produce sentences such as the a. sentences in (1) - (6), at least one reading of which is synonymous to the respective b. sentences, which are derived from the same source.¹

- 1) a. I don't think John will leave until tomorrow.
b. I think John won't leave until tomorrow.
- 2) a. I don't believe John is a very good linguist.
b. I believe John isn't a very good linguist.
- 3) a. I don't expect that he'll ever become one.
b. I expect that he'll never become one.
- 4) a. It's not likely that he'll lift a finger to help.
b. It's likely that he won't lift a finger to help.
- 5) a. Roger doesn't seem to be too happy about it.
b. Roger seems not to be too happy about it.
- 6) a. He didn't want to go, but they drafted him anyway.
b. He wanted to stay (=not go), but they drafted him anyway.

The syntactic argument that has been considered to give crucial support to the semantic grounds for claiming that the a. and b. sentences are derived from the same underlying representation is as follows: the negative element that appears in the matrix sentence on the surface cannot be regularly assigned to the matrix sentence in deep structure because the deep structure complements of, for example, (1a), (3a), (4a), and (5a) would then have to have the shapes of (7) - (10), which are ungrammatical.

- 7) *John will leave until tomorrow.
- 8) *John will ever become a good linguist.
- 9) *John will lift a finger to help.
- 10) *Roger is too happy about it.

Klima's argument that Neg appears in both clauses in deep structure and that the phenomenon is one of "Neg-absorption", by which the matrix Neg "absorbs" or otherwise zaps out the embedded Neg, seems to be ignored by the more recent treatments, probably because this analysis would violate the hypothesis that semantic interpretation is uniquely determined by the deep structure inasmuch as paraphrases like (1a) and (1b) would have contradictory deep structures:

11) Klima's underlying representation for (1a) and (1b):

- (1a) I-neg-think [~~John-neg-will-leave-until-tomorrow~~]_{Comp}
 (1b) I-think [~~John-neg-will-leave-until-tomorrow~~]_{Comp}

Sentences like (12) and (13), which Klima cites in support of his analysis, have not figured in recent treatments.

- 12) She is too weak to have another child until after the operation.
 13) Scarcely anybody expected him to get there until after five.

I return below to the problem illustrated by these sentences, although not these particular constructions.

When the sentential complements of sentences such as the above are pronominalized under identity with an antecedent S, we sometimes find the pro-form so and sometimes the pro-form it. Thus, restricting the discussion to think and believe, consider (14).

- 14) a. John thinks I'm a fool and Bill thinks so, too.
 b. John doesn't think I wrote this and Max doesn't think so, either.
 c. Max believes John didn't pass and I believe so, too.
 d. Max doesn't believe John passed and I don't believe so, either.
 e. Harry believes that Oswald killed Kennedy and John believes it, too.
 f. Harry doesn't believe that I'm here and I don't really believe it, either.

Notice that think does not accept it as a pro-form for S, although it can pronominalize an NP. Thus, sentences like (15a) are impossible, though (15b) is tolerable.

- 15) a. *Harry thinks that Oswald killed Kennedy and John thinks it, too.
 b. Henry thinks double-think and I think it, too.

What is the significance of the fact that S complements of believe pronominalize both to so and it whereas S complements of think pronominalize only to so? One possibility is that different verbs govern different choices of S pro-forms like different verbs govern different choices of the complementizers for-to, POSS-ing, and that. I abandon this possibility without discussion since generalizations which will soon become apparent would be missed by such a solution.

Before going on, I should try to justify my assumption that so in these sentences is a pro-form and not a predicate as in that water is wet is definitely so. Lakoff has suggested (Lakoff, 1966) the latter interpretation, according to which I think so is derived from I think it is so by a rule deleting it is before so, and I think not by a further rule deleting so after not. There are at least three or four arguments against this proposal.

- a) There is a so elsewhere, immediately following a transitive verb, which has to be a pro-form for S—namely, so in do so.

- assuming that do represents a predicate in underlying structure which takes a sentence as object.
- b) it S is so as a higher S seems semantically superfluous.
 - c) It is claimed by this interpretation that the second clauses of (14a - d) are semantically more complex than their initial clauses and also than the second clauses of (14e - f).
 - d) It is not clear how the derivation of (16b - c) from (16a) or (17b) from (17a) would be prevented:

- 16) a. Although Sid asserts that it is so, I don't believe that it is so.
- b. *Although Sid asserts that it is so, I don't believe so.
- c. *Although Sid asserts so, I don't believe so.
- 17) a. Although Sid asserts that it is not so, I don't believe that it is not so.
- b. *Although Sid asserts not, I don't believe not.

Although these arguments are not decisive, I consider it simpler and more natural to treat so in the sentences we are concerned with as a sentential pro-form.

To continue with the question of the distribution of the two pro-forms it and so, look back at (16b) and then consider (18).

- 18) Although Sid asserts that it is so, I don't believe it.

The fact that (18) is grammatical and (16b) is ungrammatical rules out the possibility that, for those verbs like believe which occur with both, so and it are optional variants in all environments. Nor have any further rules applied to (18) which might have the effect of filtering out a tree with so (or its pre-lexical equivalent) in the way it-replacement, for example, does not accept as input a sentence with the that complementizer.² Now consider other environments which exclude so, as in (19) - (22).

- 19) John said Bill finked on Max and I believe it.
 - 20) I just saw John shoot Max, but people I inform of this don't believe it.
 - 21) The evidence that neg-raising is cyclic is so convincing that I now believe it.
 - 22) Max believes Dirksen has a frog in his throat.
- *so.
- but I don't believe so.
but I don't believe it.
but I can't believe it.
*but I can't believe so.

At least one environment, on the other hand, excludes it. This is in responses to yes-no questions which ask for information:

- 23) Q. Was Caesar a Jew? A. I believe so.
- ?*I believe it. (bad in the intended meaning; ODD otherwise)

- 24) Q. Is neg-raising cyclic? A. I don't believe so.
 ?*I don't believe it. (except as
 rebuttal to claim presumed behind the question)

By now it should be apparent that it would be misguided to look for syntactic: contextual conditioning or output constraints on the distribution of so and it as lexical markers of a deleted S. It would be difficult to imagine what they might be, in any case. (23) and (24), especially, make it clear that believe so and believe it differ in meaning, at least in some cases, and therefore must arise from different underlying (semantic) representations. Notice, too, that the first two versions of (22), one with so and one with it, while both acceptable, differ semantically. In these clear cases, believe so seems to mean "have the opinion that S" whereas believe it seems to mean "accept the claim that S". If this is an accurate characterization, the bad sentences in (19) - (24) are explained as excluded due to semantic anomaly. In the contexts of (19) - (22) the appropriate meanings involve a response to a claim. (For the anomaly in (22) note that I can have an opinion is meaningless except as meaning "I am allowed to have an opinion".) It is odd, for example, for people to have an opinion about an event they haven't witnessed independent of their reaction to the report of it. Note the oddity of (25).

- 25) ?*I just saw John shoot Max, but people I inform of this
 { don't have the opinion that John did.
 { have the opinion that John didn't.

Similarly, it is normal to respond to a question with one's opinion, not with one's acceptance or rejection of the proposition being queried.

Syntactic evidence that the semantic representations underlying these two phrases are genuinely different and that the difference in meaning claimed above is not merely apparent can be found in the following data (where underlining is to be read as major stress):

- 26) Richard believes that Strom runs the country,
 a. and I believe it, too, but many people simply can't (believe it).
 b. *and I believe it, too, but many people simply can't believe it.
 c. and I believe so, too, but many people simply can't believe it.
 d. ?*and I believe so, too, but many people simply can't (believe it).

George Lakoff (1968a) and Karttunen (1968) have noted that anaphoric pronouns and noun phrases bear reduced stress and may not have high stress. Thus, in (27b) John and the idiot cannot be co-referential, although they are in (27a):

- 27) a. John_i kept pestering me for a job so I finally hired the idiot_i.
 b. *John_i kept pestering me for a job so I finally hired the idiot_i.

(26) a. and b. show that this generalization applies to verb phrases, as well. But notice that in c. believe it occurs with high stress, implying that believe it and believe so cannot refer to identical

semantic representations. This counting for non-identity for purposes of anaphoric stress reduction cannot be attributed to the difference in morphemes, of course, since facts like (27) and especially facts like those pointed out by Georgia Green (1968), in which anaphoric or "pseudo-pronominalized" verb phrases refer back even to affective presuppositions, show that this phenomenon has nothing to do with lexical items. I am not sure of the status or significance of d., incidentally, but in any case c. is sufficient evidence for my point.

I know of no way to prove that all instances of believe it and believe so have the meanings I have attributed to them respectively. This is something which the intuition of each native speaker must decide;³ I have consulted mine and she is willing to go along with me for the time being. If someone wants to claim, however, that one or the other or both are not everywhere consistent in meaning, he will have difficulty justifying in the theory the fact that in a certain range of cases they do have distinct meanings.

Assuming, then, that they are everywhere semantically consistent, what is the source of the semantic difference? One possibility is that there are two different predicates, both of which are realized phonologically as believe. To explain the difference in the phonological realization of their respective S pro-forms, each predicate would have to have a separate lexical insertion rule since the two morphemes believe, though homophonous, would have to have a different feature marking to select the correct pro-form. The second possibility is that there is just one predicate 'Believe' and the different pro-forms so and it are realizations of different configurations of underlying structure, thus accounting for the semantic difference. The suggestion that comes most easily to mind is that whereas so is simply the insertion for a deleted S, it is inserted for a complex NP like, say, 'Claim that S'. The third possibility is that there is both the difference in underlying (semantic) configuration for which the pro-forms are inserted and two different semantic predicates. In this case, a single lexical insertion rule might be made unspecified enough to handle both predicates with a single lexical item believe. This would seem possible if semantic representations utilize features, although it is not clear how this could be done if semantic representations consist of only trees.

Help in placing values on these alternatives might be forthcoming from evidence for the following claim which I now make: that negative-raising does not occur in derivations involving the underlying structure which corresponds to believe it. It is worth making clear here, in case I have obscured it above, that sentences with believe and un-pronominalized S complements are generally ambiguous between the senses of believe it and believe so (i.e. except when the content or context makes one of the readings semantically anomalous). Thus (28)

(28) I believe that Lincoln was a great man.

- a. because I believe whatever my teacher tells me.
- b. because he had a beard.

can either express the acceptance of a previous or presupposed claim

or express a volunteered opinion. Contexts a. and b. clarify this difference somewhat. (The argument that they are really different would take us back to (26) and the same results, with the pro-forms replaced by the full complements read at low stress.) This systematic ambiguity is, of course, only what we would expect, since it and so are merely substitutes either for the same S complement or for what end up in surface structure as S complements of the same shape. Given this ambiguity, notice that if neg-raising applies to believe in whatever sense, (29) should be four-ways ambiguous, as suggested in a. - d.:

- 29) I don't believe that Lincoln was a great man.
 a. I believe something else.
 b. because I never believe what my teacher tells me.
 c. In fact, I feel quite strongly that he wasn't.
 d. because that's what my teacher said and I always believe my teacher.

I find it difficult to get the reading suggested by d. However, I don't consider this good evidence for my claim. But before proceeding to it, I want to look at a counter-argument.

The claim that neg-raising does not apply to believe that S sentences of the it type will be immediately countered by a sentence such as (30).

- 30) Bill didn't believe that John would come until the next day and I didn't believe it, either.

Here we have an it pro-form, and if the Neg of didn't believe did not originate in the S complement, we would have to say that *John would come until the next day is the S underlying it. According to the standard argument, this cannot be the case because ungrammatical strings cannot act as S complements and therefore we have here a case of neg-raising in a believe it construction.

However, the standard argument is faulty, as (31) - (34) will show.

- 31) a. I didn't realize that I had to do it until tomorrow.
 b. I realized that I didn't have to do it until tomorrow.
 32) a. I didn't claim that I'd finish the paper until Friday.
 b. I claimed that I wouldn't finish the paper until Friday.
 33) a. It isn't clear that he'll leave until next week.
 b. It's clear that he won't leave until next week.
 34) a. I can't believe that he'd take the exam until he's ready.
 b. I can believe that he wouldn't take the exam until he's ready.

In each of these pairs, the a. and b. sentences are not paraphrases, so we cannot say that the Neg in the underlying structures of the a. sentences is a part of the complement S and not of the matrix sentence. These are reminiscent of the sentences which caused Klima to propose neg-absorption rather than neg-raising, but his proposal is also unacceptable for the reason given earlier.

The same point can be made about other constructions supposed-ly diagnostic for the presence of Neg in the complement S. For

example, (35) - (37):

- 35) a. I didn't realize anyone had come.
b. I realized no one had come.
- 36) a. It isn't clear that Sirhan could help what he did.
b. It's clear that Sirhan couldn't help what he did.
- 37) a. You can't make me believe that he lifted a finger to help.
b. You can make me believe that he didn't lift a finger to help.

The matrix verbs in (31) - (37) clearly are not marked to undergo the neg-raising rule, and they have demonstrated that constructions like until phrases are not really diagnostic of any particular scope of negation. The details of the underlying representation of such sentences is far from clear, but it seems probable that higher S's are involved whose predicates are lowered into lower S's at the site of variables and indices by rules like those already justified for quantifiers. For example, (35a) and (31a) might have underlying representations roughly like (38) and (39):

- 38) $\neg \exists_x$ (I realized x came) \rightarrow I didn't realize anyone had come.
- 39) \neg Before tomorrow_y (I realized I had to do_y it) \rightarrow I didn't realize I had to do it until tomorrow.

lift a finger probably should be represented by an existential quantifier as is any, allowing the idiomatic phonological material to be inserted (after quantifier lowering) for a derived constituent of semantic material something like (40).

- 40) \exists Effort \rightarrow lift a finger

Without the standard argument for the existence of a neg-raising rule, is there reason to continue to believe that there is one? Robin Lakoff will undoubtedly answer this question more conclusively than I can in her paper tomorrow, but in the meantime sentences like (41) provide fairly persuasive evidence that there is:

- 41) I don't think Bill paid his taxes and Mary is quite sure of it.

The it in this sentence is interpreted as meaning "Bill didn't pay his taxes". This means that at the time of S-deletion Neg was part of a constituent in which the top-most node S dominated Neg and Bill paid his taxes but not think. This clearly implies that the Neg has been transported,⁴ if our basic assumptions about pronominalization are not simply invalid. Note also the anaphoric reduced stress in (29c), which leads to the same conclusion.

To return to the evidence for the claim that neg-raising does not apply to the believe it sense of believe, consider (42) and (43).

- 42) Bill believes that John won't come until later and I don't believe so, either.
- 43) *Bill believes that John won't come until later and I don't believe it, either.

Neg-raising must have occurred in (42) because if it were the matrix verb of the second clause that is negated, the conjunction would have to be but, not and with either. But notice that this cannot happen in (43) where the embedded S is represented by it. The contrast is perhaps clearer in (44) and (45), where the contexts are more distinctive for the two senses of believe:

- 44) Was there a conspiracy? Mary believes there wasn't and I don't believe so, either.
 45) Warren claims there was no conspiracy. *Because we trust authority, Mary believes there wasn't and I don't believe it, either.

The sharp observer will have noticed that this result was foreshadowed by the non-synonymy of a. and b. in (34) above, recalling from the discussion of (22) that can (in the 'able to' sense) requires the believe it interpretation of believe.

The fact that believe it does not undergo neg-raising suggests that the difference between the two believe's might be the presence in the complement of the former the complex NP 'Claim that S', as suggested above. The Complex NP Constraint would then prevent the removal of Neg from the embedded S. This would parallel the situation with factive verbs, which also do not undergo neg-raising, presumably for the same reason, i.e. they have as object the complex NP 'Fact that S'. However, believe it apparently allows it-replacement, which should also be blocked by the Complex NP Constraint. Thus (46):

- 46) Warren claims that Oswald shot Kennedy. Mary believes it and I believe Oswald to have shot Kennedy, too.

I don't know what to make of this, except to remark that know, which seems to be a factive verb, is similarly exceptional in allowing it-replacement, as in (47).

- 47) The FBI knows Edgar to be a Communist.

Even if it is the case that 'Claim' is present in the semantic representation of believe it sentences, I think it correct that the presence vs. absence of 'Claim' is not enough to account for the semantic difference between the two senses of believe. This is not to say that there must be two lexical items believe. As noted above, the apparatus of lexical insertion rules presumably will allow us to exploit what similarity in meaning there is and insert the morpheme believe for both semantic configurations with the same rule. But these matters have not yet taken shape in the theory.

We should note a generalization which points to a different possibility. It cannot be an accident 1) that believe in the believe so sense is semantically very close to the predicate underlying think (note that think may not occur in the environments (18) - (22), exactly those environments in which believe cannot be interpreted as believe so but only as believe it); 2) that think accepts only the pro-form so; and 3) that it is believe so, having the meaning it does, that undergoes neg-raising in common with think.

All the less could we consider it accidental if it can be shown that other neg-raising verbs like expect have properties like those I have shown for believe, as I suspect they do.

I would like to think that think and the synonymous believe (and possibly expect, etc.) are lexically inserted by the same rule for a semantic configuration something like 'Hold the opinion' and that the choice of the particular morpheme think or believe, etc. is determined by some sort of reference to strength of feeling or affective nuances in a way parallel to the way awfully, terribly, wonderfully, etc. are alternatively inserted (I should hope, by a single rule) for a single semantic configuration of emphatic qualification. This is, of course, speculation, but the reason it would be nice is the following:

Jerry Morgan has observed (personal communication) that to be consistent with the rather basic assumption that rule government is a function of lexical items (the conception is, of course, that developed in Lakoff, 1965) pre-lexical rules should not have exceptions. For the reasons touched on in McGawley (1968), we currently like to think that lexical insertion takes place after all cyclic rules have operated. Thus, cyclic rules are pre-lexical rules—at least until we change our minds about something. But facts like (48)

- 48) I don't think Mary believes that John expects to be too happy about the divorce.

indicate that neg-raising is a cyclic rule and should therefore be pre-lexical and without exceptions, contrary to the assumption to date that it is a minor rule with exceptions, namely, those verbs marked to undergo it. If it can be argued that neg-raising applies only to those versions of the verbs of this set which mean 'Hold the opinion', then it can be a pre-lexical exceptionless rule whose structural description mentions the semantic predicate (or configuration) 'Hold the opinion'. The exceptional behavior reflected in the variability among dialects and languages of the lexical items that may participate in neg-raising (e.g. anticipate in some but not all dialects) would appear in the variability of the set of lexical items that the single lexical insertion rule could draw on to insert for the predicate 'Hold the opinion'.

Two things must be mentioned, however. It is not clear that syntactic rules which mention particular predicates should be allowed in a theory of grammar, and secondly, this suggestion, even if valid, would only cover the cases of neg-raising verbs of the semantic class of think—i.e. believe, expect, anticipate, guess, suppose, etc. The semantic configuration of want would have to have its own rule, and the same probably goes for seem, appear, likely, etc.

FOOTNOTES

1. Dwight Bolinger has pointed out that these pairs are not perfectly synonymous in actual fact: the negation of the complement sentences in the a. sentences is somehow "weaker" or "less certain"

than in the b. sentences. In this paper I pretend that this embarrassing fact does not exist. See G. Lakoff (1968b) for some discussion.

2. Note that treating go as a predicate would not get rid of the problem, since one would still have to explain why it is is not deleted in this environment as happens in other environments after believe. In fact, whether or not go is really a pro-form or a predicate does not significantly affect the argument of the paper, as far as I can see.

3. Individual native speakers will have to check out, for example, the implicit claim in my analysis that the second clause in (i),

- i) Bill didn't believe that John would come until tomorrow and I didn't believe it, either.

which was central to the argument in G. Lakoff (1968b), means "I didn't accept the claim that John would come before tomorrow" rather than "I believed that John wouldn't come until tomorrow", as Lakoff was assuming. For the role of the until phrase in my analysis, see below in the text.

4. The expressions "transportation" and "raising" are used loosely throughout the paper without prejudice as to whether the actual rule is a movement transformation or rather the sum of a copying and a deleting transformation.

ADDENDUM

In the discussion following presentation of this paper, George Lakoff pointed out that even with pre-lexical rules lexical items may still govern exceptional behavior with regard to rule application if we interpret the rule government features of a lexical item as requiring that the lexical insertion rule corresponding to that item block in those cases in which the relevant semantic predicate has undergone (or failed to undergo) any of the rules for which the lexical item is marked for non-application (or application). Presumably, since it is doubtful that the structure of a derived constituent can uniquely reveal what transformations have operated to derive it, this requires that rules (at least lexical insertion rules) must be able to refer to something like Transformation-markers (in Chomsky's sense), a type of representation for which no other use has been found, to my knowledge. Or else a record of rule applications in a derivation is kept by some other mechanism, to which lexical insertion rules make reference before operating. Although such apparatus seems regrettably burdensome, it may turn out that such things are necessary in an adequate theory.

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