

Relative Clause Structures and Constraints on Types
of Complex Sentences*

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The study of relative clause sentences shows quite clearly the limitations of our present grasp of the relation between syntax and semantics. In trying to understand what relative clause sentences are, I have been struck by two facts. First, there are certain very clear structural properties of relative clause sentences which distinguish them from sentences containing, for example, sentential subjects or objects. These seem to me to be strictly syntactic properties. Second, there are certain very subtle meaning differences between definite and indefinite noun phrases containing relative clauses; clearly a semantic fact. Let us briefly characterize these two facts.

Describing the semantics of definiteness seems in part to involve, as outlined by Karttunen (1969), several disjunctive statements of what the speaker presupposes the hearer knows about the entity named by the definite noun phrase. But this would be just a beginning, for we find the definite determiner used with superlatives, and we find certain instances of the conditions for its use apparently being satisfied, and yet it is not used. For example, I am puzzled as to why we generally say

(1) Here is a cookie.

or

(2) Have a cookie.

instead of

(3) Here is the cookie.

and

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- (4) Have the cookie.

under conditions that normally give rise to the definite determiner, namely in case the referent is in sight of both speaker and hearer, as in

- (5) Look at the dog.
(6) Please lock the door.

I look forward to a discussion of a model of linguistic description which allows for an account of such semantic areas as definiteness; I see no proposal of such a model even on the horizon at present.

The structural facts I have been referring to include the following: Relative clause sentences appear to be instances of the syntactic device known as embedding. However, when we compare them to sentences containing embedded subjects and objects as in

- (7) His speaking so eloquently impresses me.
(8) I like his speaking so eloquently.

we find that the embedded portions of (7) and (8) play an obligatory role with respect to the main verb, the role which Fillmore (1968) has called the objective case. In addition, the verb governs both the occurrence of the clause in such sentences and the type of clause which can occur. These facts are not true of relative clause sentences. The relative clause plays no role, obligatory or otherwise, with respect to the main verb. No verb, then, is ever marked for taking a relative clause. Structurally speaking, it is superfluous. The relative clause sentence amounts to two independent propositions: These facts can be accounted for if only sentences with embedded subjects and objects are considered to be instances of underlying embedding, and relative clause sentences are taken as instances of underlying conjunction.

The facts that lead me to this conclusion seem to be quite independent of whether the head noun in the relative clause sentence is definite or indefinite. There is no structural motivation for assuming a different underlying representation for these two sentences:

- (9) The pitcher that I gave to Harry last year is on Jane's table now.
(10) A pitcher that I gave to Harry last year is on Jane's table now.

Definiteness is simply not relevant for specifying these syntactic facts about relative clause sentences.

The approach which appears to me to be incorrect, that there is no underlying autonomous level of syntactic representation, has been argued for by Lakoff (to appear), Lakoff and Ross (1967), McCawley (1967, 1968a, 1968b, in press). I object to this position on two grounds.

First, it suggests that there is, if we can just get deep enough, one abstract representation (referred to by the proponents

as "the semantic representation") for a given sentence. But there is no reason to believe that one deep structure cannot underlie more than one sentence, even where the sentences are not necessarily synonymous.

My second point of criticism is that it seems quite possible, and I think conceptually valuable, to define a level of representation exhibiting the relationships among the items in one sentence as well as the relationships among the simplex components of a complex structure. The question of whether these relationships are semantic or syntactic simply does not need to arise. The fact is that these relations among the structural elements of a sentence can be represented formally in terms of structures which underlie surface structures exactly according to the kinds of arguments for underlying structures which can be found in Postal (1964) and Chomsky (1965). Moreover, it is only information of this relational type which has been shown so far to justify any formalism for underlying representations. In other words, we can conceive of a theory of sentence structure in terms of a model in which superficial syntactic structures are related to more abstract syntactico-semantic structures. These are the deepest representations which we are able to discover by the use of linguistic evidence; they represent the relationships among the basic pieces of a sentence. This view will be elaborated in more detail below.

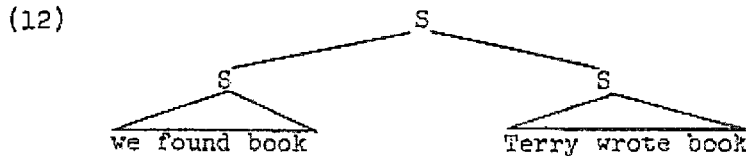
In other words, as long as we insist that sentences (9) and (10) must have different deepest underlying representations because they have recognizably different meanings, the structural relationship between relative clause sentences and conjunctions will be virtually impossible to discern. Indeed this relationship has not been observed, and I think this is because it is very difficult to represent one pair of conjuncts as distinct from another in such a way as to capture the meaning difference between (9) and (10). I, for one, cannot construct such conjunction sets.

In fact, I think this is totally incorrect. My understanding of the structure of relative clause sentences and sentence complexity depends upon the assumption that the deepest structure of a sentence does not exhibit the full range of information about its meaning. I will suggest that what underlies a sentence is not a single representation revealing everything that that sentence "means," but instead a "basic elemental structure" (BES) for that sentence plus a set of parameters which can be associated with this BES and which play a role in determining the transformations which it can undergo and what its surface structure will be. The BES will specify the meanings of "content words" and the relationships among them.

To see how I suggest that syntactic structures and semantic "parameters" might interact, let us take an example. Underlying the sentence

(11) We found the book that Terry wrote.

would be the BES:



The way this structure comes to the surface is determined partially by such factors as definiteness. If the speaker presupposes¹ that

¹"Presupposes x" is here used in the fairly well-accepted sense of "believes x," where x represents a set of conditions which must be met for a given sentence to be uttered in good faith, and which are independent of the illocutionary force of that sentence.

the hearer knows neither of the facts expressed in the conjunction, the surface form of the sentence may be the conjunction

(13) Terry wrote a book and we found it.

or either of the following relative clause sentences, with an indefinite head noun:

(14) We found a book that Terry wrote.

(15) Terry wrote a book that we found.

If the speaker presupposes that the hearer knows about the fact expressed in the first conjunct, the corresponding relative clause sentence will have that conjunct as the relative clause, and the head noun must be definite:

(16) Terry wrote the book that we found.

and if the speaker presupposes that the hearer knows about the information of the second conjunct, the surface sentence will be

(17) We found the book that Terry wrote.

The implications of this analysis as well as well as the relationship between non-restrictive relative clause sentences and conjunctions are discussed more fully in my paper, "The deep structure of relative clauses."

This account is the only one I know of which attempts to characterize the fact that, with the definite determiner, the relative clause expresses information which the speaker presupposes to be known by the hearer.

It might be suggested that, instead of having certain semantic parameters affecting the derivation of a sentence at various underlying levels, I could as easily have semantic interpretation rules assign appropriate readings to the surface structure of the sentence

in question. Although there is much that is similar in these two positions, evidence such as the following, which was provided by Stephen Krashen (personal communication), forces me to prefer the former. The presuppositional facts which hold for relative clause sentences hold for sentences with pre-nominal adjectives as well. The sentence

(18) Janice wore the outfit that is black.

is used by a speaker who presupposes that the hearer knows about the outfit that is black. The sentence

(19) Janice wore the black outfit.

carries precisely the same presuppositions. A semantic interpretation rule providing this information which operated on surface structures would either have to be stated twice, once for each surface structure, or it would have to contain a note to the effect that what is semantically true of relative clause sentences is true of prenominal adjective sentences. Since neither of these alternatives is defensible, I prefer to view the interaction between syntax and semantics as I have outlined above.

In certain respects my view of the relationship between syntax and semantics is reminiscent of that put forth in Chapter 9 of Chomsky (1957):

It seems clear that undeniable, though only imperfect correspondences hold between formal and semantic features in language. The fact that the correspondences are so inexact suggests that meaning will be relatively useless as a basis for grammatical description. Careful analysis of each proposal for reliance on meaning confirms this and shows, in fact, that important insights and generalizations about linguistic structure may be missed if vague semantic clues are followed too closely. For example, we have seen that the active-passive relation is just one instance of a very general and fundamental aspect of formal linguistic structure. The similarity between active-passive, negation, declarative-interrogative, and other transformational relations would not have come to light if the active-passive relation had been investigated exclusively in terms of such notions as synonymy. (p. 10)

To digress briefly, my position is also reminiscent of the position taken by the opponents of Bertrand Russell's "Theory of Descriptions." [According to Russell (1905, 1919), definite noun phrases which are complex "refer to" entities in a very special way.] Such noun phrases cannot refer to entities in the ordinary sense, he argues, because it is quite possible to reformulate a proposition containing the noun phrase in question without mentioning it at all. So, the sentence

(20) The author of Waverley is Scotch (sic).

is actually a conjunction of three propositions:

- (21) (a) At least one person wrote Waverley.
- (b) At most one person wrote Waverley.
- (c) Whoever wrote Waverley is Scotch.

Russell (1919, p. 177)

A sentence like (20), then, does not have to be viewed as meaningless even if there is no author of Waverley; (20) could be asserted to be false because (21a) was false. Similarly, the sentence

(22) The King of France is bald.

can be shown to be false because one of its underlying propositions is false.

This view was criticized, I think correctly, by both Geach and Strawson. According to Geach (1950), when the definite noun phrase, "the king of France" is the logical subject of a sentence, an affirmative answer is presupposed to the question

(23) Does the King of France exist?

Since the answer to (23) is negative, the use of the phrase as a logical subject is out of place, and the question of the truth of a sentence in which the phrase is a logical subject does not arise.

Strawson (1950) objects in a similar vein: it is false to say that a sentence such as (20) contains the proposition (21a) without recognizing that (20) is an assertion and (21a) is "implied" (in some sense of that term) by (20).

Noun phrases containing relative clauses are "definite descriptions" for Russell, similar to the subjects of (20) and (22). While the philosophical problem to which Russell, Geach, and Strawson were addressing themselves is not of central concern here, the conclusion of the latter two thinkers parallels that which I have reached. In fact, I am going one step further: in addition to claiming that the user of the phrase

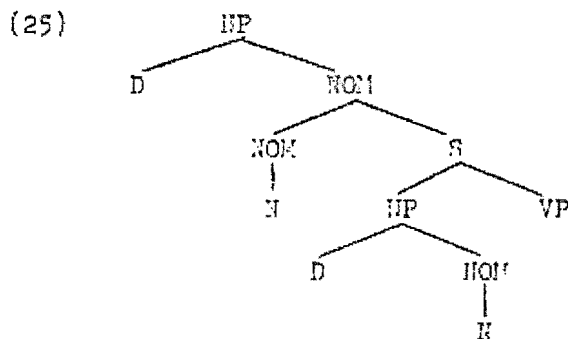
(24) the girl who speaks Basque

presupposes the existence of such a girl, I am suggesting that he also presupposes that her existence is known to the hearer.

A. "Stacked" Relative Clauses.

Most accounts of relative clause structures that I know of simply assume an underlying embedded structure, a natural assumption to make on the basis of their surface embedded form. The notable exception is the work of the UCLA English Syntax Project (Stockwell et al. (1968)), in which an attempt is made to justify the underlying

embedded structure. It is argued there that the correct analysis of relative clauses requires configurations of the form



Stockwell et al.(1968), "Relativization"

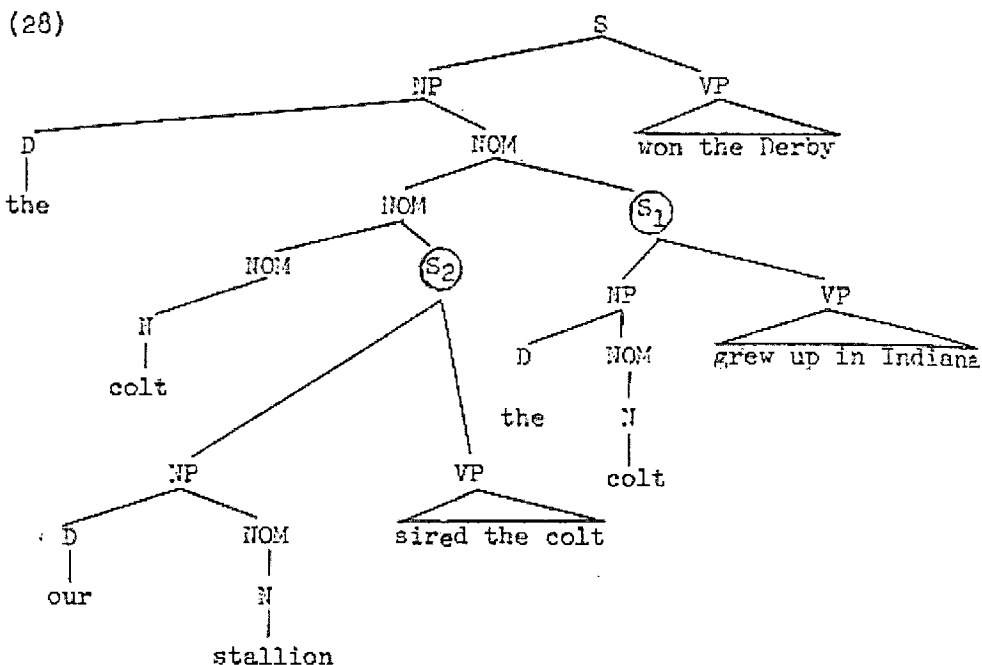
The argument for this representation turns on the claim that NP's containing more than one relative clause can be interpreted in such a way that each successive relative clause from right to left "modifies" or "restricts" the meaning of the head noun plus the preceding relative clauses. Let us take an example (op. cit. p. 23):

- (26) The colt that our stallion sired that grew up
in Indiana won the Derby.

One interpretation for (26) is

- (27) Out of all the colts sired by our stallion,
the one that won the Derby grew up in
Indiana.

In this interpretation, the clause that grew up in Indiana is taken as "restricting" the class of objects referred to by the expression the colt that our stallion sired. Let us call an interpretation like that represented by (27) a "stacked interpretation" of a multiple-relation-clause sentence, and let us furthermore call the clause that "modifies" the head noun and the other relative clause in such an interpretation the "higher ranking clause." The structure for (26) according to the UCLA analysis would be:



If the stacked interpretation of (26) has as its basis a structure like (28), then we have both an argument for an embedding analysis of relative clause sentences and an argument against a conjoining analysis of such sentences, since a conjoining structure could not directly show that the clause which I have labeled S_1 in structure (28) is of higher rank than that which I have labeled S_2 .

However, as was pointed out to me by C. J. Fillmore, although multiple relative clause constructions can be interpreted this way, there are good reasons for rejecting the proposal that stacked interpretations should be explained in terms of stacked structures.

First, notice that the stacked interpretation is closely correlated with stress. For many speakers, a non-conjoined interpretation is possible only if one clause or the other is stressed. Otherwise, the subject of (26) would be interpreted, for these speakers, as referring to a colt that both had our stallion as a parent and grew up in Indiana. For a few speakers, the stacked interpretation is possible with no special stress; for them a normally stressed multiple relative clause sentence is ambiguous between (a) a conjoined interpretation and (b) a stacked interpretation in which the outer relative clause is of higher rank. Incidentally, as pointed out in Stockwell et al (1968), the colt specified by interpretation (a) is the same colt as the one specified by interpretation (b). In other words, a conjoined and stacked interpretation do not differ extensionally.

The crucial point here is that for both of these groups of speakers, the interpretation can be switched so that the inner clause is interpreted as being of higher rank simply by stressing

that inner clause.² So,

²The UCLA group has recognized that the stacked interpretation of relative clauses is problematic, but their conclusion is that accepting or not accepting a stacked interpretation is one respect in which dialects can vary, and that to describe this difference might involve postulating different (though both embedded) analyses of relative clause sentences.

- (29) The colt that our stallion sired that grew up in Indiana won the Derby.

cannot be interpreted by either group of speakers except in the following way:

- (30) Out of all the colts that grew up in Indiana, the one that was sired by our stallion won the Derby.

What this means is that there is no motivation at all for trying to explain stacked interpretations on the basis of underlying embedding relationships in terms of which the outer relative clause is "higher" than the head noun with the inner relative clause. The fact that a clause is "higher" in a structure like (29) does not seem to correlate with whether it is interpreted as being of higher rank. It might be argued that some device could easily be introduced into the structure which would allow the lower relative clause to be interpreted as the higher ranking one, or that a "clause-scrambling rule" could operate. However, neither of these devices would in any way enhance the proposal that a stacked interpretation is based on a stacked structure, since the purpose of the introduction of either of these devices would be to force a certain interpretation in spite of the structure. In other words, the interpretation is independent of the structure, and the theory should reflect that this is the case.

Second, if a stacked relative clause structure could be justified, and did influence interpretation, then we would expect to find that preposed adjectives would carry with them the information as to which clause, in terms of position, they came from. The fact that they do not makes the stacked structure highly suspicious. That is, we can interpret the adjective-preposing rule as operating cyclically, and working from the bottom up, on each cycle inserting the adjective into the NP of the S immediately above it. But notice that no matter whether each adjective is placed before the adjective from the next lower S, or after it, there is still no correlation between this linear ordering and interpretation of rank. For example, from the noun phrase

- (31) the man who has a beard who is bare-footed

we can derive the following noun phrases, by preposing one adjective at a time;

- (32) the bearded man who is bare-footed
- (33) the bare-footed man who has a beard

or both together;

- (34) the bearded bare-footed man

In each case, the interpretation is linked to the stress: the adjective that is stressed is interpreted as modifying the rest of the NP, independent of its position; if neither is stressed, they are interpreted as being conjoined.

Third, if the stacked relative clause structure were a basic, meaning-determining structure, we would expect the interpretation to come as naturally for sentences with indefinite determiners as for those with definite determiners. Actually this is not the case; a stacked interpretation is very difficult to impose on an NP with an indefinite determiner:

- (35) A man who had a beard who was wearing a striped shirt was passing out McCarthy buttons.

If we assumed that a stacked interpretation of relative clauses is structurally based, then, given that such an interpretation cannot be imposed on an indefinite sentence, we would have to find a way of blocking such structures in case the definite determiner has not been chosen; or alternatively, we would have to block the choice of the indefinite determiner for this structure. Either of these would seem to be an unfortunate device to introduce, since I know of no other cases in which the choice of the definite determiner depends solely on the structure of the sentence into which it is to be inserted.

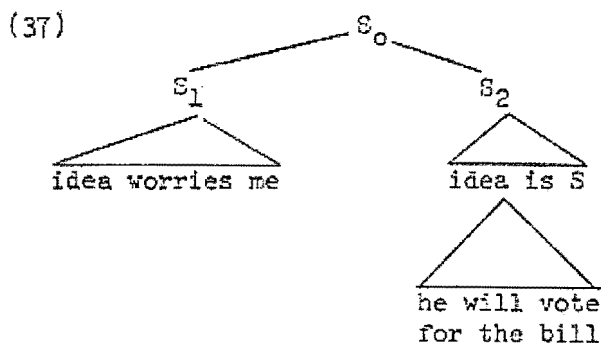
What I have shown here indicates that an argument for an embedded analysis of relative clauses which depends on a structural explanation for the stacked interpretation of relative clauses collapses when this explanation is shown to be the wrong one for such an interpretation.

E. Noun Complements.

Relative clauses have been noted to be distinct from embedded clauses in several important respects. Another type of apparently embedded clause which can be shown to behave structurally quite similarly to relative clauses is the noun complement as in

- (36) The idea that he will vote for the bill worries us.

as with relative clause sentences, (36) makes two independent prepositions involving the noun idea; the that clause is structurally superfluous. If we postulate (37) as a source for (36)



we find that precisely the same rules that generate relative clause sentences from conjunctions are used in the derivation of noun-complement sentences as well. From (37), by embedding S_2 into S_1 , we can derive

(38) The idea which is that he will vote for the bill worries us

Deletion of the WH-form plus BE is obligatory when the BE is followed by a complementizer and a sentence, resulting in sentence (36). Embedding S_1 into S_2 results in

(39) The idea which worries us is that he will vote for the bill.

The difference between the two phrases

- (40) the idea that we should go to the party
 (41) the idea that you mentioned

is clearly that, in the first the that is a complementizer while in the second it is a relative word, a replative for another occurrence of idea. This correlates with the fact that they do not conjoin:

(42) *the idea that we should go to the party and that you mentioned

Thus, although both (40) and (41) can be derived from conjunctions (though not the same conjunctions) by the same set of rules, they are not structurally identical. The structural difference also correlates with the fact that relative clause noun phrases, like

(43) the dog that they bought

and noun-complement phrases as

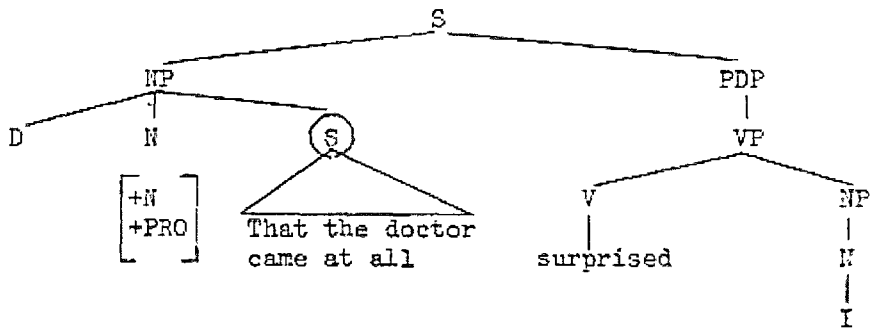
(44) the idea that she's a mother

normally receive different intonation patterns.

One might object that in my analysis the parallelism between the claim that S and I claim that S is lost. It seems quite reasonable, however, to consider that the lexicon shows that such noun-verb pairs are listed with the information that where the verb takes a sentential object, the noun takes a sentential predicate nominal.

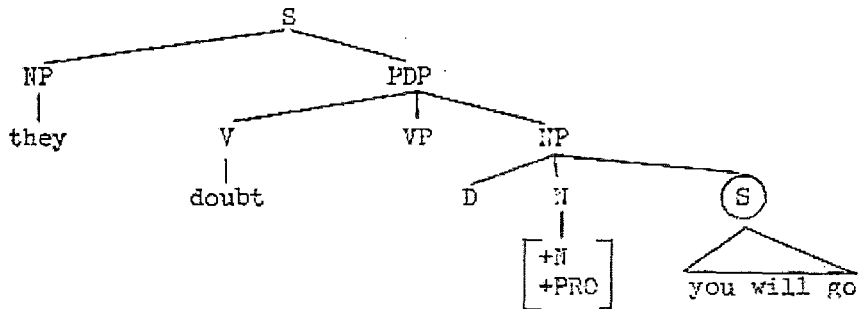
Placing the remarks we have just made concerning the nature of relative clause and noun complement sentences in a broader perspective of sentence complexity, let us consider the variety of sentence types for which embedding analyses have been proposed. The embedded S in each case has been circled.

(45) That the doctor came at all surprised me.



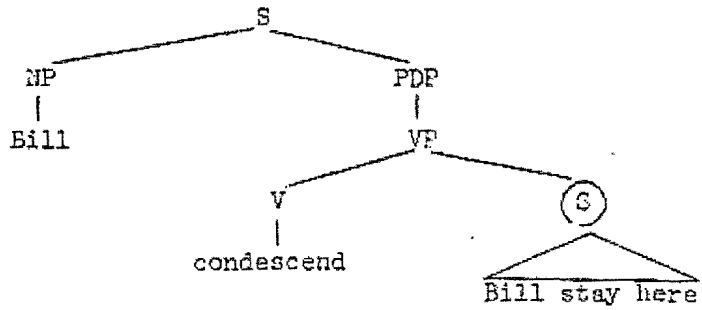
Rosenbaum (1967), p. 12

(46) They doubt that you will go.



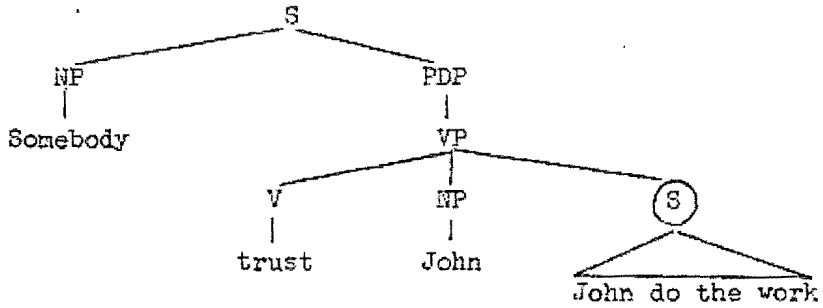
Rosenbaum (1967), p. 34

(47) Bill condescended to stay here.



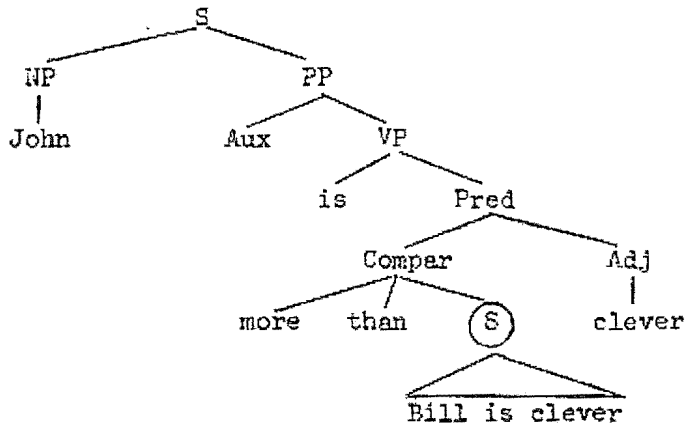
Rosenbaum (1967), p. 94

(48) Somebody trusts John to do the work.



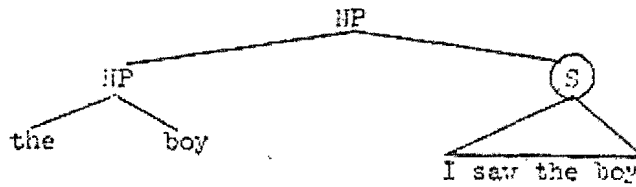
Rosenbaum (1967), p. 9

(49) John is more clever than Bill.



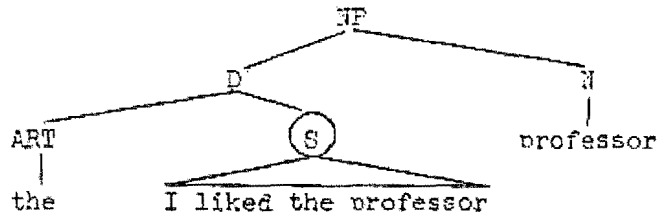
Chomsky (1965), p. 178

(50) the boy I saw



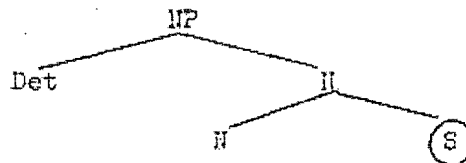
Ross (1967), p. 184

(51) the professor I liked



Stockwell et al. (1968), "Relativization," p. 3

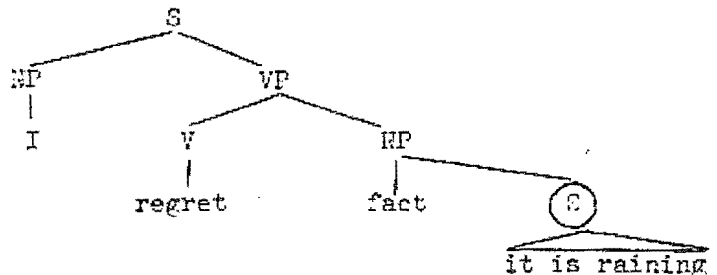
(52)



Dean (1967), p. 34

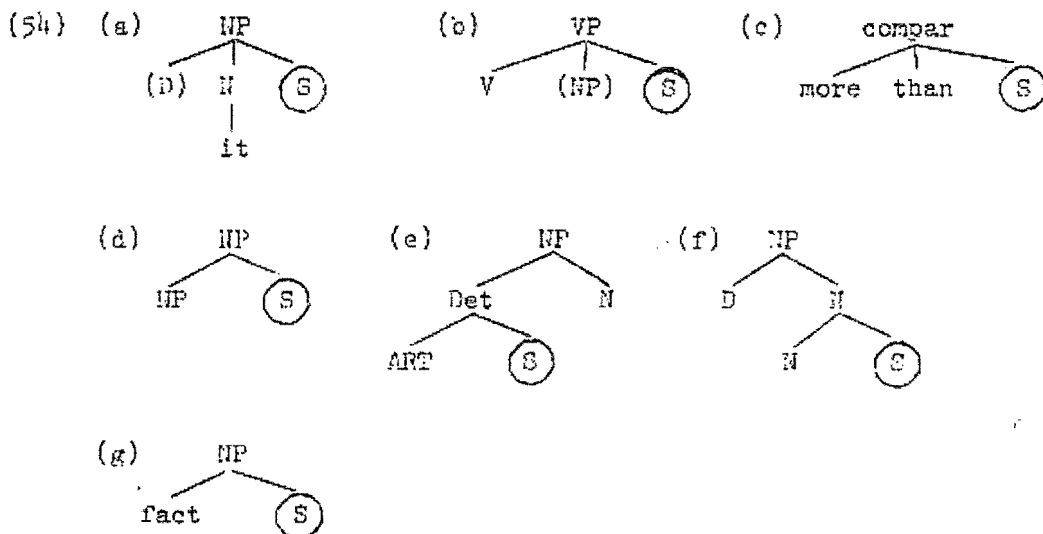
The previous three structures for relative clause sentences are in competition.

(53) I regret that it is raining.



After Kiparsky (forthcoming)

The following set of configurations summarizes the environments in which it has been proposed that S's be introduced:



The fact that each of the structures in (54) has been recently called into question suggests to me that a very natural constraint can be placed on the introduction of embedded S's. The advantages of eliminating both structures (a) and (b) have been fully dealt with by UCLA (1969), "Nominalization," Bowers (1968), and Wagner (1968); a more adequate analysis than (c) for the comparative is provided by Celce (1970); and I have shown here why structures (d) through (g) fail to be the best representations for relative clauses and noun complements. The only instances of embedded S which remain unquestioned are those in which the S is the unique expansion of an NP which is a subject or an object. Extending Fillmore's suggestion (1968), p. 28 to "limit complement S to the case OBJECTIVE," I would suggest that

- (55) All occurrences of non-topmost S's not immediately dominated by S be limited to unique expansions of subject or object NP's.

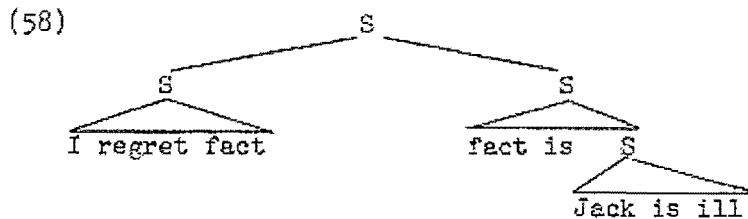
Let us call (55) the "embedding constraint." Such a constraint limits the power of a grammar in an important way by providing a natural restriction on the ways in which complex sentences may be built out of simple ones, and it provides an account of the differences between embedded and conjoined structures which I have pointed out above.

APPENDIX

Some further remarks are in order concerning one member of the class of nouns which take the surface complements, namely fact. I seem to be suggesting that sentences such as:

- (56) I regret the fact that Jack is ill.
- (57) I regret that Jack is ill.

have different BES's, that (56) would be derived from a conjunction, while (57) would result from embedding Jack is ill as the object of regret. In fact, I think that the distinction made by the Kiparskys (forthcoming) between factive and non-factive complements is a very important one and I agree with them that sentences like (56) have the same source as sentences like (57). I would propose the following source:

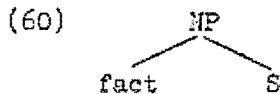


Regret is a verb which must take fact as its object; application of the rule which deletes fact yields:

- (59) I regret (Jack is ill).

which more directly underlies (57).

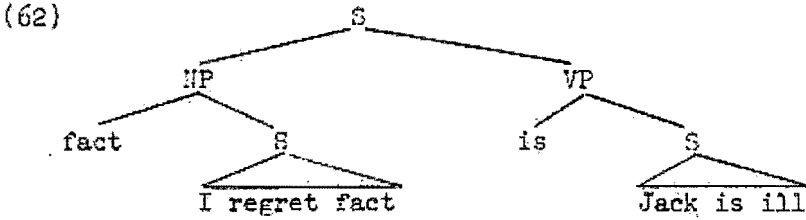
As confirmation of (58), Stephen Krashen has pointed out to me that if a configuration must be involved in stating the presupposition of factivity, as Kiparskys claim, it cannot be:



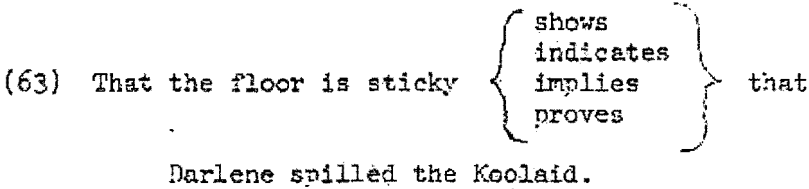
The reason for this is that the truth of the sentence Jack is ill is presupposed in:

- (61) The fact that I regret is that Jack is ill.

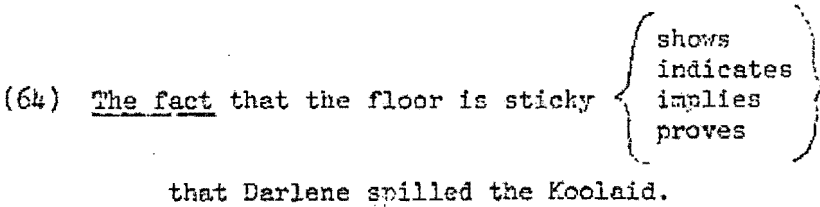
exactly as it is in (56). According to my analysis, both (56) and (61) are derived from the same BES, namely (58) (see p. 31), so that this semantic fact is accounted for in a natural way. But the Kiparskys would have to have some way besides (60) to account for the presupposition of factivity in (61), since there is no (60) under the VP node in the underlying representation that they would suggest it has:



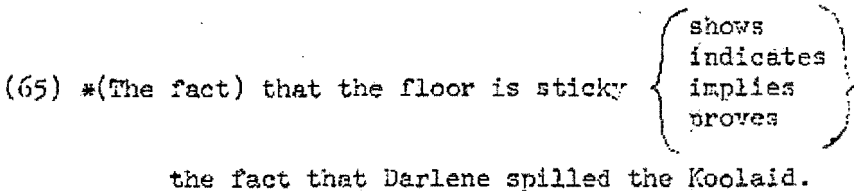
In terms of this analysis of factive sentences we are now ready to consider an apparent counterexample to the embedding constraint. A sentence like



seems to contain two occurrences of the OBJECTIVE case, a natural conclusion if complex subjects and objects can arise only from NP's in an OBJECTIVE relationship to the verb. As D. T. Langendoen pointed out to me, however, two facts indicate that the objections raised by this type of sentence are only pseudo-problems for the embedding constraint: (a) the subject clause in (63) is a predicate nominal clause to fact; and (b) this noun fact is in the INSTRUMENTAL case. To demonstrate point (a), I would cite the obvious paraphrase of (63),



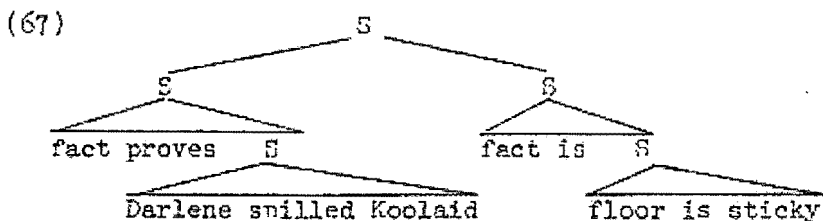
Furthermore



with the fact in both clauses, is ungrammatical, because of a selectional restriction which does not allow show, indicate, imply, prove, and the like to occur with factive objects. Sentence (64) now can be shown to be identical in structure to a sentence like (66)

(66) The knife cut the cheese.

That is, a knife can cut cheese only if someone uses it to cut cheese; a fact does not prove something unless someone uses it to prove something. In each case the verb requires an agent, which may be optionally deleted. The fact-clause in (64) is thus an underlying instrumental NP, just as the knife is in (66). The BES I propose for (64) is:



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