The Deep Structure of Relative Clauses*

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^{*}Sponsored in part by the National Science Foundation through Grant GN-534.1 from the Office of Science Information Service to the Computer and Information Science Research Center, The Ohio State University.

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A number of general studies in transformational grammar (including Chomsky (1965), Jacobs and Rosenbaum (1967), (1968), Lakoff (1966), Langendoen (1969), Ross (1967)) have assumed that the appropriate underlying representation for a relative clause sentence involves a sentence embedded into a noun phrase. I would like to question this assumption, and to suggest that in fact the appropriate underlying representation for a relative clause sentence is a conjunction.

The argument will be developed in several stages. First, I will suggest some facts which indicate what conjunctions must underlie relative clause sentences. Next, I will show the general process of relative clause formation and some of the implications of my analysis.

Finally, I will indicate in what respects the derivation of sentences containing non-restrictive relative clauses is similar to that of sentences with restrictive relative clauses.

- I. Indications that a conjunction source for relative clause sentences is correct.
- (a) To my knowledge, no arguments defending an embedding analysis against a conjunction analysis for relative clause sentences have ever been presented either in the literature or informally.
- (b) There is virtually no agreement among those who assume that relative clauses are underlyingly embedded as to what configuration of nodes is appropriate to represent the relationship between the two sentences. UCLA (1969) presents a summary of the various approaches which have been taken and the arguments given to support each.
- (c) There is a significant but generally overlooked set of structural distinctions between relative clause sentences and those complex sentences which are clearly realizations of structures containing embedded sentences, namely those containing sentential subjects or objects, such as:
 - (1) That Frieda likes to cook is obvious to me.
 - (2) I think that Frieda likes to cook.

For sentences (1) and (2), an embedding analysis is well-motivated since the contained sentence is required as an obligatory argument of the verb; it plays a role with respect to the verb which Fillmore (1968) has called the objective role and without which the verb cannot stand. Furthermore, the verb governs both the occurrence

^{*}To appear in D. T. Langendoen and C. J. Fillmore (eds.), Studies in Linguistic Semantics, Holt, Rinehart and Winston.

of clause and the type of clause which can occur. These conditions do not hold for relative clause sentences. A relative clause is always structurally superfluous; it plays no role whatever with respect to the main verb and no morphemes in the language are marked as requiring it. A relative clause sentence is equivalent to two independent predications on the same argument. These differences are captured by an analysis in which sentential subjects and objects are instances of underlying embedding, and relative clauses are only superficially embedded. If relative clause sentences are not underlyingly embedded structures this could account in part for the general disagreement, pointed out in (b) above, as to the underlying representation of the position of the embedded sentence.

II. The derivation of relative clause sentences.

Assumptions

In order to present the schematic outline for forming relative clause sentences, two assumptions must be made explicit.

- (a) The difference between parts of sentences such as the following:
 - I know a student who plays the harmonica.
 - (4) I know the student who plays the harmonica.

will be assumed to be introduced at some level of derivation other than the one at which "content morphemes" and the relations among them are specified. I leave open the question of just where such a distinction must be made; for the present discussion, it suffices to point out that (3) and (4) must have identical representations insofar as the meanings of the nouns and verbs and the relations among them are concerned. I shall further assume that the choice of the definite determiner will in general correlate with certain presuppositions which the speaker makes about the extent of his listener's knowledge.

- (b) As pointed out by Bach (1968), numerals and quantifiers must be introduced outside the clause in which they ultimately appear. That this must be so is illustrated by the fact that the sentences of (5) are not matched by the respective pairs in (6):
 - (5) a) I have three students who are flunking.
 - b) I know few people who smoke cigars.
 - c) I saw no students who had short hair.

(6) (I have three students.

a) { Three students are flunking.

- b) I know few people.
 Few people smoke cigars.
- c) (I saw no students. No students had short hair.
- Derivation

Returning now to the proposal for deriving relative clause sentences from conjunctions, I suggest that underlying (7) is a structure like (8):

- I met the girl who speaks Basque.
- (8) (I met girl) (girl speaks Basque)

The choice of the clause to become the relative clause correlates with certain presuppositions on the part of the speaker about what the hearer knows, and accordingly with the choice of the determiner. Consider (8) again. If the speaker presupposes that the hearer knows neither about his meeting a girl nor about a girl's speaking Basque, then both of the following conjunction realizations of (8) are acceptable:

- (9) I met a girl and she speaks Basque.
- (10) There's a girl who speaks Basque and I met her.

as well as both of the following relative clause sentences with indefinite head nouns:

- (11) I met a girl who speaks Basque.
- (12) A girl I met speaks Basque.

If, on the other hand, the speaker presupposes that there is a girl such that it is known by the hearer that he met her, the relative clause sentence corresponding to this presupposition will have the conjunct containing met as the relative clause, and the head noun will be definite:

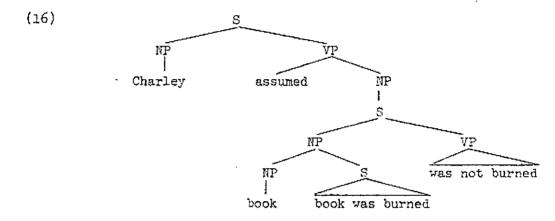
(13) The girl I met speaks Basque.

Similarly, if the speaker presupposes that his hearer knows about the girl who speaks Basque, the corresponding relative clause sentence will have the conjunct speaks Basque as the relative clause, and again the head noun will be definite:

- (14) I met the girl who speaks Basque.
- C. Implications
- (a) The distinction then, between the "matrix" and "constituent" sentences in a relative clause structure can be seen to be related to nothing in the structural portion of the representation of such sentences. The meaning difference between sentences (13) and (14), in other words, is not a function of the fact that the matrix and the constituent sentences have been interchanged; if it were, then we should expect the same meaning difference to characterize the pair (11) (12). But (11) and (12) do not have different meanings in any usual sense of the word "meaning". Instead, the semantic difference between (13) and (14) is a function of the presuppositions which the speaker has about the extent of his hearer's knowledge.
- (b) Similarly, the "restrictiveness" of a relative clause is also shown not to be a property best described in terms of an embedding underlying representation. Relative clauses with indefinite nouns do not "restrict" these nouns in the way that relative clauses with definite nouns seem to, and yet underlying embedding structures do not reveal a basis for this difference. Again, I think that the apparent "restricting" nature of relative clauses with definite head nouns is a function of the presuppositions discussed above.

- (c) Postal (1967) has shown that a certain ambiguity can be explained only if relative clauses are assumed to be derived from conjunctions. The sentence he gives is:
 - (15) Charley assumed that the book which was burned was not burned.

On one reading, Charley assumed that a certain book had not been burned when in fact it had been. On the other reading, Charley assumed a contradiction. On the hypotheses that relative clause sentences are underlyingly embedding structures, there is no way to represent the ambiguity. This is because corresponding to (15), only one embedding structure can be constructed, namely:



But there are two conjunction sources for (15). Underlying the first reading, in which Charley is merely mistaken, is the representation:

- (17) ((Charley assumed (book not burned)) (book burned)
 Notice that, as we would expect, (17) also underlies:
- (18) The book which Charley assumed was not burned was burned. which results from the first conjunct's becoming the relative clause, as well as the conjunction:
 - (19) Charley assumed that the book was not burned but it was burned.

Underlying the second reading, in which Charley assumes a contradiction, is:

(20) Charley assumed ((book burned) (book not burned))

As with (19), (20) underlies two sentences besides (16). By selecting the second of the two conjuncts of (20) as the relative clause, we can derive:

(21) Charley assumed that the book which was not burned was burned.

which is an exact paraphrase of the second reading of (15). The conjunction derivable from (20) is, of course:

(22) Charley assumed that the book was burned and that it was not burned.

At this point, it should be made clear that there is one class of relative clause sentences which do not seem to be related to conjunctions in the manner just described. A sentence such as:

(23) Men who smoke pipes look distinguished.

which contains a relative clause with a generic head noun, obviously does not have a conjunction such as:

(24) (men smoke pipes) (men look distinguished)

as its source. It is generally assumed that such a sentence is instead derived from the representation underlying an <u>if-then</u> sentence like:

(25) If a man smokes a pipe, he will look distinguished.

The extremely interesting semantic and syntactic issues raised by this assumption will unfortunately be left unexplored here.

III. Non-restrictive relative clauses.

The similarities between non-restrictive clause (=NR) sentences and conjunctions have been remarked upon by a number of linguists (see, for example, Annear (1967), Drubig (1968), Lakoff (1966), Postal (1967), Ross (1967)). I will not review these similarities, but I will assume that NR sentences must be derived from conjunctions. Again, as far as I know, no arguments have been advanced in favor of an embedded analysis for NR sentences; in those studies which present underlying embedding representations for NR's, the question of there being alternative analyses is not even raised.

At the outset, two types of NR sentences must be distinguished; I will refer to them as Type I and Type II NR sentences. Type I NR sentences are exemplified by:

- (26) Jerry, who used to play football, now has a sedentary job.
- (27) I had a date with the librarian, who read to me all evening.

Type II NR sentences are exemplified by:

(28) She took the children to the zoo, which was very helpful.

(29) Joe debated in high school, which Chuck did too.

In type I NR sentences, the relative pronoun replaces a referring noun phrase; in Type II, it replaces an entity, the nature of which will be clarified later in this section. For the moment, we will consider only Type I.

A. Type I MR's

Ross' proposal (1967, p. 174) that all Type I NR's be derived from second conjuncts seems to be correct. That is, at some intermediate level before anaphoric pronominalization has applied, given a conjunction each of whose clauses contain an occurrence of a correferential noun, the second conjunct can be moved to a position immediately following the noun in the first conjunct. Pronominalization can then apply, moving either backwards or forwards¹, so that

from the conjunction

(30) George noticed that Margie refused the candy, and George didn't take any candy.

any of the following can be derived:

- (31) George, who didn't take any either, noticed that Margie refused the candy.
- (32) George, who noticed that Margie refused the candy, didn't take any either.
- (33) George, who didn't take any candy, noticed that Margie refused it too.
- (34) George, who noticed that Mergie refused it too, didn't take any candy.

One apparent counterexample to the claim that NR's are derived from second conjuncts is the following sentence:

(35) Is even Clarence, who is wearing mauve socks, a swinger?

As Ross (1967) points out, its conjunction counterpart does not exist:

(36) *Is even Clarence a swinger, and he is wearing mauve socks?

It seems to me that Ross' solution to this problem is not as radical as he indicates. As a source for (36) he proposes the structure underlying:

(37) Is even Clarence a swinger? Clarence is wearing mauve socks.

¹Ronald Langacker pointed out this fact to me.

Instead of following Ross in his conclusion that all NR's must be derived from sequences of sentences, I claim instead that the connector is deleted between a question and a declarative.

Imperatives are similar to questions in this respect. The source of:

(38) Tell your father, who is outside, that supper is ready.

apparently cannot be:

(39) *Tell your father that supper is ready, and he is outside.

But if there is a rule deleting and between imperatives and declaratives, the problems disappear. Notice that it would not help to posit a conjunction source in which the declarative sentence came before the question or imperative; questions and imperatives simply cannot be connected to declaratives by and, either before them or after them.

- (40) Clarence is wearing mauve socks, and is even he a swinger?
- (41) Your father is outside, and tell him that supper is ready.

Finally, a restriction must be placed on the NR rule to the effect that questions and imperatives themselves cannot become NR's.

At this point two objections might be raised; I would like to consider these in slightly greater detail. First, it has often been suggested that an NR represents an assertion by the speaker, a comment injected into the sentence whose truth is being vouched for by the speaker independently of the content of the rest of the sentence. An example of the type of sentence which makes such an analysis seem likely is

(42) The mayor, who is an old windbag, designated himself to give the speech.

An implication of this analysis is that NR sentences should be represented in such a way as to reflect that the NR is an independent assertion made by the speaker, perhaps by positing a separate superordinate declarative performative for it. However, it is not correct to assign the responsibility for the truth of every NR to the speaker of the sentence in which it occurs. Bach (1968, p. 95) points out that a sentence like

(43) I dreamt that Rebecca, who is a friend of mine from college, was on the phone.

which might be thought to contain an NR asserted by the speaker, can be made ambiguous by changing is to was. The case is even clearer in a sentence in which the subject is different from the speaker.

It seems to me that the following sentences are ambiguous as to whether the subject or the speaker is vouching for the truth of the NR:

- (44) Harold says that his girlfriend, who is a little bit crazy, wants to go to Hanoi.
- (45) The claims agent said that the paint job, which should have been done long ago, would cost \$150.

In fact, each of the above sentences can be disamtiguated by adding a clause which forces the interpretation in which it is the subject, rather than the speaker, who asserts the NR.

- (46) Harold says that his girlfriend, who is a little bit crazy, wants to go to Hanoi, but I think she's too rational to try it.
- (47) The claims agent said that the paint job, which should have been done long ago, would cost \$150, but he doesn't know that now is when it should be done.

The other possible objection to my thesis is that if both non-restrictive and restrictive relative clause sentences are derived from conjunctions, then sentences of both types, which may have very different meanings, can be derived from identical sources. Arguments against having identical sources for the two types of sentences carry weight only for sentences with numerals in them, which I will discuss shortly. In other cases, it seems that once again the differences between restrictive and non-restrictive relative clause sentences are not of the sort that ought to be represented structurally; instead they are differences representing a speaker's decision about how to present to the hearer information present in the underlying representation. For example, consider the two sentences:

- (48) The boy, who works at the library, is majoring in philosophy.
- (49) The boy who works at the library is majoring in philosophy.

The representation underlying both of these is:

(50) (boy works in library) (boy is majoring in philosophy)

For (48) the speaker has decided that the boy is already known to the hearer; the speaker is adding two pieces of information about that boy. For (49) the speaker assumes that the hearer knows about the boy who works at the library; the can be used with this NP, and the information which the speaker assumes to be new appears as the main predicate. I can see no way in which such a difference as that which exists between restrictives and non-restrictives could be represented in a consistent way for all such sentences in terms of some underlying structural distinction.

Restrictive and non-restrictive relative clause sentences with numeral associated with the head nouns do have different representations. Consider the sentences:

- (51) Three boys who had beards were at the party.
- (52) Three boys, who had beards, were at the party.

The assertions are quite different: (51) means not that three boys were at the party, but that there were three boys all of whom both attended the party and had beards. But (52) does mean that there were three boys at the party. Understanding very little about the representation of numerals, I can do no more now than to suggest that underlying (51), the numeral is associated with neither of the conjuncts, while underlying (52) it appears in both. This is confirmed by the fact that corresponding to (51) there is no two-clause conjunction, but corresponding to (52) we find:

- (53) Three boys were at the party, and they had beards.
- B. Type II NR's

Type II NR's are also derived from second conjuncts. The examples given above of Type II NR's were

- (28) She took the children to the zoo, which was very helpful.
- (29) Joe debated in high school, which Chuck did too.

I suggest that these are immediately derived from the sentences

- (54) She took the children to the zoo, and that was very helpful.
- (55) Joe debated in high school, and that Chuck did too.

Before outlining the process by which Type II NR's are formed, let us consider a derivation in reverse, with (28) as an example. Its immediate source is (54). The that of (54) is a pro-form for certain repeated portions of a sentence; directly underlying (54) would be

(56) She took the children to the zoo, and her taking the children to the zoo was very helpful.

Disregarding the tense of the first conjunct, we can see that the that in (54) has replaced the repeated portion of the second conjunct of (56). Let us take a derivation in reverse with another example:

- (57) They said she could play the marimba, which she can.
- The sentence containing that which immediately underlies (57) is
 - (58) They said she could play the marimba, and that she can.

Directly underlying (58) is the full form with the repeated portion preposed:

(59) They said she could play the marimba, and play the marimba she can.

The immediate source for (59) is

(60) They said she could play the marimba, and she can play the marimba.

In detail, the derivation of a type II NR sentence proceeds as follows: Given a near-surface-level conjunction in which part of the surface VP of the first conjunct matches part of the VP of the second conjunct, (a) the repeated portion may be preposed; (b) the

²This formulation is slightly inaccurate. Exactly what gets preposed will be described more carefully below.

preposed portion may be replaced by $\underline{\text{that}};^3$ and (c) the connector may

3The order of these two rules will be reviewed below.

drop, with concomitant change of that to which.

Notice that, as outlined by Chomsky (1957), when there is no auxiliary element to carry emphasis or negation, a do must be added, as in the following examples:

- (61) She promised to dance for us, and she did dance for us.
- (a) She promised to dance for us, and dance for us she did.
- (b) She promised to dance for us, and that she did.
- (c) She promised to dance for us, which she did.
- (61) She dances well, and I don't dance well.
- (a) She dances well, and dance well I don't.
- (b) She dances well, and that I don't.
- (c) She dances well, which I don't.

The following examples show the operation of an optional rule of "parenthesis:"

- (63) That Cornelius was pleased was to be expected, and he certainly seemed to be pleased.
- (a) That Cornelius was pleased, and he certainly seemed to be pleased, was to be expected.
- (b) That Cornelius was pleased, and pleased he certainly seemed to be, was to be expected.
- (c) That Cornelius was pleased, and that he certainly seemed to be, was to be expected.

(d) That Cornelius was pleased, which he certainly seemed to be, was to be expected.

A special set of examples is the following, in which a do appears:

- (64) She taught me to bake a cake, and I couldn't bake a cake before.
- (a) She taught me to bake a cake, and bake a cake I couldn't do before.
- (b) She taught me to bake a cake, and that I couldn't do before.
- (c) She taught me to bake a cake, which I couldn't do before.
- (65) We read <u>Tom Sawyer</u>, and we had never read <u>Tom Sawyer</u> as children.
- (a) We read <u>Tom Sawyer</u>, and read <u>Tom Sawyer</u> we had never done as children.
- (b) We read <u>Tom Sawyer</u>, and that we had never done as children.
- (c) We read Tom Sawyer, which we had never done as children.

Sentences such as (64) and (65), when considered with certain other sentence types, provide evidence for two related hypotheses.

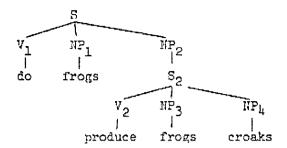
The first, advanced by Ross, is that activity verbs are associated at some level with the "primordial" action verb, do. "I understand him

⁴I cannot fully appreciate Ross' position since I have access to it only in the very sketchy form of a handout from his paper, "Act," presented at the July 1969 meeting of the Linguistic Society of America in Urbana, Illinois. From this handout, and from reports on the paper, I believe that the points which I have attributed to Ross are accurately stated here.

to be claiming that this <u>do</u> is present in the underlying representation of all activity sentences. Because its occurrence is entirely predictable, I would choose not to view it as present at this level, but as inserted into activity sentences early in their derivation.

The second hypothesis which sentences such as (64) and (65) provide evidence for is that the <u>do</u> in such sentences has as its object an NP. According to Ross, the NP in question is the underlying object of <u>do</u>, and it is an entire sentence:

⁽⁶⁶⁾ Frogs produce croaks.



Aside from the fact that there seems to be no evidence for NP_3 , that is a second underlying occurrence of the surface subject, the evidence which indicates that the <u>do</u> must take an NP object indicates that it is not an underlying NP that we are concerned with here at all, and that it is not a sentence. Let us consider this evidence. In a sentence like

(67) I realized that Art had visited the Dean, which I should do too.

we are tempted to declare that the which replaced an NP, since we know that in restrictive relative clause sentences and in Type I NR sentences, which always replaces an NP. However, this is not a very strong argument, since in questions, which can replace a demonstrative:

(68) Which book did you steal? I stole this book.

But the argument that which replaces an MP becomes more convincing when we consider the immediate source for (67), namely:

(69) I realized that Art had visited the Dean, and that I should too.

Beyond these NR sentences, no example of that replacing anything but an NP comes to mind. Further support comes from a paraphrase of (67):

(70) I realized that Art had visited the Dean, (which is) something I should do too.

Something is the NP pro-form par excellence, and it is clearly the object of do. But what it is coreferential with is not the sentence:

(71) Art had visited the Dean.

since what underlies sentences (67), (69), and (70) is not

(72) *I realized that Art had visited the Dean, and I should Art visit the Dean too.

What underlies (67), (69), and (70) instead is

(73) I realized that Art had visited the Dean, and I should visit the Dean too.

In other words, somehow the phrase visit the Dean must be an NP before the rules changing this phrase to that apply.

Ross has suggested that pseudo-cleft sentences provide additional support for the hypothesis that phrases like <u>visit the Dean</u> must be NP's:

- (74) What I should do is visit the Dean.
- (75) Art did what I should do: visit the Dean.

What examples (67) through (75) show is that the NP which the NR and pseudo-cleft rules, and certain other rules, must refer to need not be an S at any level.

Further evidence that the NP referred to by these rules is a surface NP rather than an underlying NP can be found in the fact that what follows surface be must also be an NP. A collection of relevant examples is

- (76) Nick is tell, which I will never be.
- (77) Nick is tall, (which is) something I will never be.
- (78) What I will never be is tall.
- (79) Nick is what I will never be: tall.

Ross (1969) has used examples like these to show that adjectives must be underlying NP's. However, examples like the following show that adjectives and other post-be expressions must be not underlying but superficial NP's.

- (80) I saw that Irma was easy to please, which I should be too.
- (81) I saw that Irma was easy to please, (which is) something I should be too.
- (82) What I should be is easy to please.
- (83) Irma is what I should be: easy to please.

The expression easy to please in (80) - (83) cannot be an underlying MP, since in deep structure easy and please are not even constituents of the same S:

(84) ((one please Irma) easy)

In the examples

- (85) Chinese was easily mastered by Rich, which it was not by Claire.
- (86) Chinese was easily mastered by Rich, (which is) something it was not by Claire.

(87) What Chinese was was easily mastered by Rich.

We can see that the phrase <u>easily mastered</u> is not an underlying complement of <u>be</u> for there is no underlying <u>be</u>; moreover, since the verb <u>master</u> is an activity verb, at some intermediate level it would actually be the object of do.

My proposal, then, is the following: neither do nor be is present in underlying representations. Be may become the main verb by any of a variety of well-known obligatory transformations. Do is inserted preceding activity verbs. At the point at which do or be is inserted into a sentence, the part of the VP which follows becomes an MP; its MP status is then referred to by a number of optional rules, such as those which produce the sentences we have been considering here. If none of these rules applies to separate the do from its object, Ross' rule of 'do-gobbling' applies, deleting do's that are directly followed by their objects.

If this analysis is in general correct, we are ready to reformulate the steps by which Type II NR's may be formed. Rephrasing the set of three rules (a) - (c) given earlier, we arrive at the following statement: Given a near-surface-level conjunction in which part of the surface VP of the second conjunct is a repetition of part of the surface VP of the first conjunct, (a) the NP "complement" of be or do may be preposed; (b) this NP may be replaced by that; and (c) the connector may drop, with concemitant change of that to which. This reformulation corrects two inaccuracies in the previous (a) - (c). The earlier formulation said that the portion of the second conjunct involved in these rules was the "repeated portion." This is not quite accurate, since in

(83) Nick is tall, and I shall never be tall.

be is part of the repeated portion of the second conjunct (with tense disregarded). But clearly the be is not part of what is changed to that, or preposed:

- (89) Nick is tall, which I shall never be.
- (90) Nick is tall, and that I shall never be.
- (91) Nick is tall, and I shall never be that.
- (92) *Wick is tall, which I shall never.
- (93) Wick is tall, and that I shall never.
- (94) *Nick is tall, and I shall never that.

What does achieve the desired results is the requirement that what is preposed or changed to that be an NP.

Second, the order of rules (a) and (b) is irrelevant now, since that can appear either after do or be or in its preposed position. Beginning with the initial sentence of (64), we derive

(95) She taught me to bake a cake, and bake a cake I couldn't do before. by applying (a) alone,

(96) She taught me to bake a cake, and I couldn't do that before.

by applying (b) alone, and:

(97) She taught me to bake a cake, and that I couldn't do before.

by applying both rules. Similarly, beginning with (80), we derive

(98) I saw that Irma was easy to please, and easy to please I should be too.

by applying (a) alone, and:

(99) I saw that Irma was easy to please, and I should be that too.

by applying (b) alone, and:

(100) I saw that Irma was easy to please, and that I should be too.

by applying both rules.

One final minor point. A <u>do</u> occurring immediately after a stressed modal may be dropped. Thus, sentences (57) and (65) have a variant form with final <u>do</u>:

(101) They said she could play the marimba, which she can (do).

In this section I have considered two types of NR sentences, showing how both are related to near-surface conjunctions, and how NR sentences of Type II provide evidence for two hypotheses, one that activity sentences have at some level do as main verb, and the other that only at a fairly superficial level must the phrase following do or be be an NP.

IV. Summary.

I have tried to present some heretofore unexamined evidence that both restrictive and non-restrictive relative clauses must be derived from underlying conjunctions, and that this can be achieved in a grammar with certain well-motivated and fairly traditional restrictions on what aspects of the meaning of a sentence are to be represented at the structural level of its underlying representation.

APPENDIX

As this paper was going to press, a squib appeared in <u>Linguistic Inquiry</u> 1.3, July 1970, by David Perlmutter and John Robert Ross, in which it was proposed that sentences like

(i) a man entered the room and a woman went out who were quite similar

"present the theory with a new paradox." In their words,

Neither of these singular noun phrases can serve as the antecedent of a relative clause whose predicate (similar) requires an underlying plural subject, and whose verb (were) is inflected to agree with a plural subject in surface structure. The only possible antecedent of the relative clause in (i) would seem to be the discontinuous noun phrase a man ... (and) a woman. But how can a discontinuous noun phrase be the antecedent of a relative clause? No analysis of relative clauses that has yet been proposed for the theory of generative grammar is able to account for sentences like (i). (p. 350).

I would like to suggest that sentences such as (i), [which are indeed anomalous in a traditional embedding analysis of relative clause sentences], present no paradox at all if relative clause sentences are viewed as underlying conjunctions; the conjunction source for (i) would simply be:

(ii) (man entered room) (woman went out of room) (man and woman were similar).

References:

- Annear, Sandra S. See Thompson.
- Bach, Emmon (1968) "Nouns and noun-phrases," in Bach and Harms (1968).
- Bach, Emmon and Robert T. Harms (1968) Universals in Linguistic Theory, New York: Holt, Rinehart and Winston.
- Chomsky, Noam (1957) Syntactic Structures, The Hague: Mouton. Chomsky, Noam (1965) Aspects of the Theory of Syntax, Cambridge, Mass.: M.I.T. Press.
- Drubig, Bernhard (1968) "Some remarks on relative clauses in English," Journal of English as a Second Language 3.2.23-40.
- Fillmore, Charles J. (1968) "The case for case," in Each and Harms (1968).
- Jacobs, Roderick, and Peter Rosenbaum (1967) Grammar I., Grammar II, Boston: Ginn & Co.
- Lakoff, George (1966) "Deep and surface grammar," Unpublished paper. Langendoen, D. Terence (1969) The Study of Syntax, New York: Holt, Rinehart and Winston.
- Postal, Paul (1967) "Restrictive relative clauses and other matters," Unpublished paper.
- Reibel, David and Sanford Schane (1969) Modern Studies in English, Englewood Cliffs, N.J.: Prentice-Hall.
- Ross, John R. (1967) "Constraints on variables in syntax," Ph. D. Dissertation, M.I.T.
- Ross, John R. (1969) "Adjectives as noun phrases," in Reibel and Schane (1969).
- Thompson, Sandra Annear (1968) "Relative clauses and conjunctions," Working Papers in Linguistics No. 1, Onio State University Research Foundation.
- UCLA English Syntax Project Report (1969) Los Angeles.