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A Partial History of the Relative Clause in English

Item Type	article;article
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Download date	2025-03-21 00:05:01
Link to Item	https://hdl.handle.net/20.500.14394/49874

A Partial History of the Relative Clause in English*

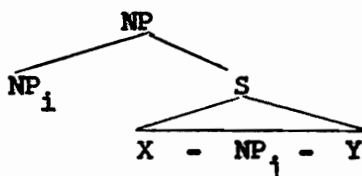
Samuel Jay Keyser

Most English generative grammarians have recognised the existence of a grammatical process called relative clause formation. The usual view of this process is as follows:

- (1) When the head NP of an NP commands a clause which contains a coreferential noun phrase, then
 - i. replace the commanded coreferential noun phrase by the appropriate relative pronoun
 - ii. move the relative pronoun to the front of its clause
 - iii. optionally delete the relative pronoun subject to certain constraints.

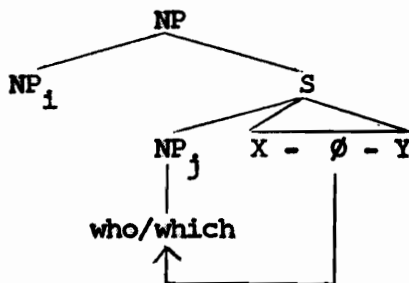
The structure in which this takes place can be represented as (2):

(2)



When NP_i and NP_j are coreferential in (2), NP_j is replaced by either who or which and then moved to the front of its clause:

(3)



Some sentences which result from this process are:

- (4) a. She liked the man who she spoke to.
- b. The book which I read has been misplaced.

It is also the case that when NP_j in (2) is itself part of a prepositional phrase, then the preposition may accompany the relative pronoun to the front. This phenomenon, known as Pied Piping (we shall return to this below) gives rise to:

- (5) a. She liked the man to whom she spoke.
- b. The book in which we inscribed our names is missing.

Finally, a relative pronoun which has been moved to the front of a clause may delete, providing no preposition has accompanied it:

- (6) a. She liked the man she spoke to.

- b. *She liked the man to she spoke.
- c. The book we inscribed our names in is missing.
- d. *The book in we inscribed our names is missing.

Recently, a somewhat different account has been given in Emonds (1970). This account is based upon his broader theory according to which all transformations are held to be of two main types, either root transformations or structure preserving transformations.¹ Emonds defines a structure preserving rule as "... a transformation such that (i) the structural description specifies the location in trees of two nodes B_1 and B_2 bearing the same label X , and (ii) the structural changes move B_2 and all the material dominated by it into the position of B_1 , deleting B_1 ." A root transformation, on the other hand, is one "... in which any constituents moved, inserted, or copied are immediately dominated by a root in the derived structure." (1970, 10). In this definition a root is defined as "...either the highest S in a tree, an S immediately dominated by the highest S , or the reported S in direct discourse." (1970, 9). Within this theoretical framework Emonds proposes to deal with relative clause formation as follows:

- (7) I will assume that relativization is accomplished in steps, the first step being pronominalization. This means that a deep structure NP which is to be relativized is first either replaced by a personal pronoun or else totally deleted, and is secondly (if it has been pronominalized) moved to the front of its clause and changed to a relative pronoun by wh movement. Thus a typical relative clause can be derived through the steps outlined in (50).

(50) Deep Structure:

The friend (that I spoke to a friend) drove away.

Removal of NP by relativization: optional pronoun is left behind:

- A. The friend (that I spoke to him) drove away.
- B. The friend (that I spoke to) drive away.

Wh fronting in A of either NP or PP dominating pronoun (obligatory):

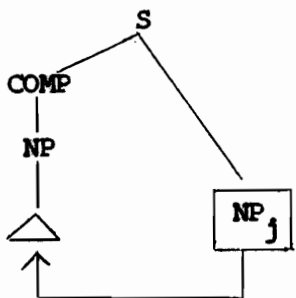
- A. The friend (who I spoke to) drove away.
- B. The friend (to whom I spoke) drove away.

Optional that deletion in B:

- B. The friend ((that) I spoke to) drove away.

As can be seen from this excerpt, Emonds takes the position held by many grammarians that the morpheme that is not a relative pronoun but, rather, is a marker on subordinate clauses, including restrictive relative clauses. This marker is dominated by the symbol COMP and is spelled out as that if no prior structure-preserving rule has moved a similar structure into the COMP position. The operation of wh fronting Emonds would represent as follows:

(8)



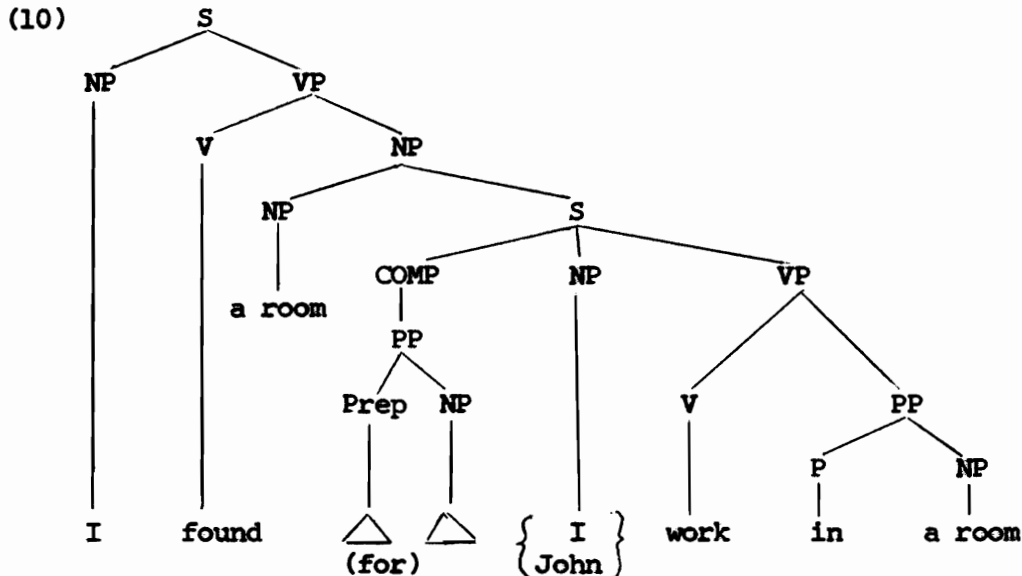
Since COMP dominates an NP node which is empty, NP_j , according to the structure-preserving hypothesis is permitted to j move into the COMP position. Were the COMP to dominate a PP, then only a PP such as to whom would be permitted to move into the COMP position. This movement of like structures into like structures dominated by empty nodes constitutes the heart of Emonds' hypothesis. The position that wh fronting is a structure-preserving rule is crucial to Emonds' hypothesis: "It is imperative that we investigate wh fronting carefully, for it is certainly not a minor movement rule or a root transformation ... if our structure-preserving hypothesis is to stand in its present form, wh fronting must be a structure-preserving rule." (1970, 192).

The claim that grammatical rules are either root transformations, structure-preserving transformations or minor movement rules is a universal claim, of course, and the data surrounding the rule of wh fronting provide a very good testing ground for structure-preserving as a theoretical universal. In what follows I shall examine, first, Emonds' arguments for wh fronting being structure-preserving in modern English. Then, I shall look at the consequences of his proposal in an independent language, namely Middle English. Finally, I shall return to Modern English with an alternative hypothesis.²

Let us begin by looking at the evidence for wh fronting as a structure-preserving rule in Modern English. Emonds considers the following sentences:

- (9) a. I found a room in which to work.
 b. *I found a room in which for John to work.
 c. *I found a room which for John to work in.
 d. I found a room to work in.
 e. I found a room for John to work in.
 f. *I found a room which John to work in.

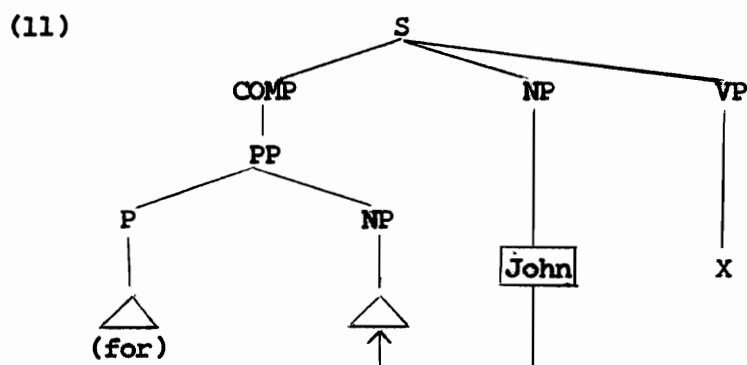
The presence of the relative pronoun which in (9a) strongly suggests that we have to do here with a relative infinitival clause. To account for the distribution of sentences in (9) Emonds postulates the following deep structure:



Recall, now, that Emonds defines a structure-preserving movement rule as "... a transformation such that (i) the structural description specifies the location in trees of two nodes B_1 and B_2 bearing the same label X , and (ii) the structural changes move B_2 and all the material dominated by it into the position of B_1 , deleting B_2 ." He supposes that wh-fronting is such a movement rule. "In terms of this definition the fact that COMP in (10) has been expanded as a PP entails that only the entire PP phrase [in a room]_{PP} must be moved into the [PP]_{COMP} position: "In particular, this PP, present under COMP throughout the transformational derivation takes up the position for fronted wh constituents and rules out the possibility of a wh-fronted NP. Thus any infinitive with a possible for phrase subject which is also a wh construction should not exhibit a wh-fronted NP." (Emonds 1970,200)

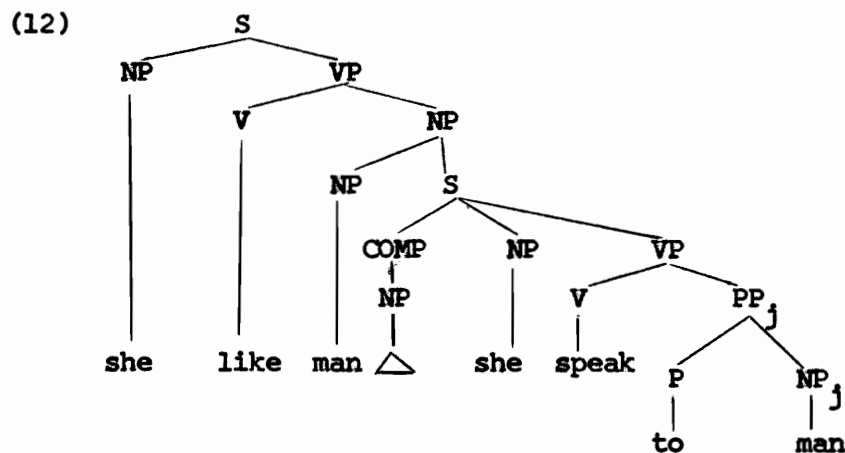
In other words the position for wh-fronted phrases in a tree is occupied by the constituent dominated by COMP. Moreover, in structure-preserving transformations, constituents may only move into like constituents, providing that the target constituents do not dominate lexical items, i.e. providing they contain empty nodes. Since the position for wh-fronted phrases has been expanded into PP in (10), the only constituents that can move into that position are PP constituents. In the tree in (10) this would be accomplished with the preposition in moving into the preposition position under COMP and with the NP room moving into the NP under COMP. No other movement is possible. And, in Emonds' framework, this explains why (9a) is grammatical.

Emonds in addition supposes that a non-identical subject which is not deleted by Equi-NP Deletion must move into the empty NP node in COMP position. This is indicated in (11):



An immediate consequence of a rule which operates as in (11) - a rule which is itself structure-preserving since an NP moves into an empty NP node - is that this rule prevents any subsequent wh-fronting. This follows since wh-fronting is a structure-preserving rule and since such rules move constituents dominating lexical items into like constituents dominating empty nodes. The prior operation of the rule producing (11) makes the NP node under COMP non-empty and therefore blocks wh-fronting of the constituent [in a room]_{PP}. This explains the ungrammaticality of (9b,c) since in each of these strings the rule illustrated in (11) has operated to block fronting of in which. These ungrammatical strings contain an illegitimate fronting operation. Notice that the grammaticality of (9d,e) indicates a further consequence of Emonds' system, namely that non-fronted wh-forms are deleted. In both of these sentences the final in shows that fronting had not occurred. (Recall only the entire PP could front.) In (9d) fronting, an optional rule, has not been applied and therefore the wh-form must be deleted. In (9e) the movement of the subject John as in (11) has prevented the entire PP [in a room] from fronting. Therefore, the wh-form has deleted to yield (9e). Finally, the ungrammaticality of (9f) provides further confirmation of Emonds' hypothesis. Thus, since structure-preserving demands that like empty nodes be filled by like non-empty nodes, it automatically follows that (9f) must be ungrammatical since it involves the operation of wh-fronting in such a fashion as to violate structure-preservation since an unlike node, namely NP has been moved into an unlike node, namely PP.

Extrapolating from the above, we now see how Emonds proposes to deal with such relative clauses as those in (4) through (6) above. The deep structure of (4a), for example, might be



Wh-fronting could apply to move NP_j into the delta position under COMP, thereby complying with the principle of structure-preserving to yield (13):

(13) She liked the man who she spoke to.

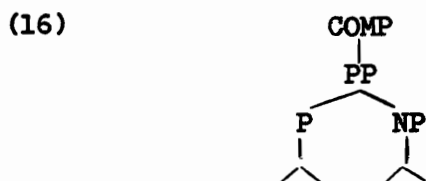
Alternatively, if no movement takes place, NP_j would simply delete and delta would be spelled out by that to yield (14):

(14) She liked the man that she spoke to.

If that deletion were to apply subsequently to (14) we would derive:

(15) She liked the man she spoke to.

Finally, if the COMP node in (12) had been expanded not into NP, but into PP, i.e.:



then, the structure-preserving hypothesis would cause the entire PP_j to be fronted by wh-fronting, to yield:

(17) She liked the man to whom she spoke.

Having examined in some detail the operation of the structure-preserving hypothesis in Modern English, we now turn to the facts of Middle English in an attempt to see if the hypothesis remains viable. It should be noted first, however, that the hypothesis that wh-fronting is structure preserving is only of interest if the claim is a universal one. Therefore, if the facts of Middle English contravene the hypothesis, then since wh-fronting cannot be a minor movement rule or a root transformation, the general hypothesis of structure-preserving is seriously weakened.

Some Historical Consequences

The historical situation with respect to sequences involving relative pronouns and the marker that is rather clear, thanks to the compendious investigations of scholars like Visser (1963), Poutsma (1926), Jespersen (1924, 1927) and more recently Klima (1964b). The historical situation can be summed up as follows:

Stage 1

- (18)
1. In Middle English that was used widely as a marker of subordinate clauses, replacing the Old English þe.
 - i. Ther was a duc that highte Theseus. (A.Kn.860)
 2. In Middle English that was deletable.
 - i. She hadde a cok hight Chauntecleer (Ch.B. 4039)

3. Early in Middle English the relative pronouns which and whom appeared, replacing the Old English relative se þe. Which was used for both human and nonhuman antecedents initially, but soon whom was restricted to human antecedents.
 - i. that is my nece and called is Cryseyde, which som men wolden don oppressioun. (TC.2.1414)
 - ii. And now thow woldest falsly been about to love my lady, whom I love and serve (A.Kn.1142)
4. The relative pronoun who, i.e. the nominative who does not occur throughout the Middle English period. Mustanoja (1960) observes: "In reference to persons that or which is used instead of the nominative who throughout the ME period. Only a few sporadic occurrences of strictly relative who are recorded before the 15th century:

he hadde bote an doȝter wo miȝte is eir be (RGlouc.1977)
 'he had but one daughter who might be his heir'
 bliþe was eche a barn ho best miȝt him plese (WPal.88)
 'happy was every child who might please him best'
 ... In the first half of the 15th century the strictly relative who occurs, by the side of which, in the more or less stereotyped closing phrases of some Paston letters (by the grace of God, who have you ever in his keeping)... The nominative who is hardly found in 15th century literary texts, and even in Caxton it is very rare."
5. A relative pronoun deletion rule already existed in Middle English.
 - i. By thilke feith ye owe to me (RR.2106)
 - ii. Bi þe fey ich owe to god... (R.Glouc.)

For the sake of discussion I shall refer to that stage of the language summarized in (18. 1-5) as Stage 1. In terms of what I have said above it is characterized by relative clause formation of a limited sort³, that deletion, and relative pronoun deletion as well.

Now given a system such as that outlined in (18) plus the universality of structure-preserving rules, one would expect to find restrictive relative clauses in Middle English precisely like those illustrated in (4)-(6) and in (12)-(17). The one sequence that one would never expect to find would be a relative clause which begins with a relative pronoun followed by the subordinate marker that. Sequences like whom that and which that are impossible if wh-fronting is (universally) a structure-preserving rule. This follows, of course, since the only way that that can appear in a surface string is if the wh-word has not been fronted to replace it. If it has been fronted, then the wh-word must occupy the COMP position (cf. (12) above) and that is prevented from being spelled out. It is therefore counter evidence to the structure-preserving hypothesis that we find in Middle English sentences like:

- (19)
1. He which that hath the shortest shall begin (A.Prol.836)
 2. Only the sighte of hire whom that I serve (A.Kn.1231)
 3. Of alle thynges which that I have sayd (D.Sum.1768)

Sentences like those in (19), by no means rare in Middle English, are important for two reasons. First, they constitute a counter-example to the

structure-preserving hypothesis by denying its universality. Second, they raise the important question of what happened between Middle English and Modern English to eliminate such sequences as relative pronoun + that from the language.

At this point let us consider the next stage in the development of these sequences. This stage is characterized as follows:

- (20) 1. whom that and which that disappear from the language.
 2. the nominative relative who comes into use.
 3. the sequence who that where who is the nominative relative pronoun never occurs in the English of this (or any preceding or following) stage.

Klima (1964) cites several sources in support of the above observation: "Mustanoja (1960, 197) notes: 'the combination which that is found all through the Middle English period ... but becomes rare by the end of the fifteenth century.' Commenting on the following sentence from Ingelend (1560), Abbott (1897, 187) writes: 'Spite of his spite which that in vain/Doth seek to free my phantasy.' This use of which that consecutively is common in Chaucer, but not in Elizabethan authors. Sugden (1936, 61) observes: 'A supplementary that after who, what and which was in popular use during the fifteenth century, but was less used in the sixteenth century.' Engel (1908, 19) notes that 'who that as a non-attributive generalizing relative pronoun does not occur at all in Shakespeare and Bacon.'"

How can we account for this change from Stage 1 to the subsequent early Modern English stage in which who as a nominative relative appears and in which relative pronoun + that does not? One possibility, of course, would be to suppose that wh-fronting was not a structure-preserving rule in Middle English but came to be one in early Modern English. This would automatically account for the disappearance of which/whom + that from the language. The difficulty with this, however, is apparent. By saying that wh-fronting was not a structure-preserving rule in Middle English one is forced to add to rather than constrain the power of a grammar. Thus, in Middle English one would have to suppose four kinds of rules; namely, structure-preserving rules, root transformations, minor movement rules and then wh-fronting as well, which is none of the above. This situation is far from satisfactory and suggests that we look elsewhere for an explanation.

An Alternative Hypothesis

In recent literature (cf. Perlmutter 1971; Ross 1971) independent evidence in support of output conditions on grammars has been given. I now consider the change subsequent to Stage 1 in terms of one such output condition. Recall that this condition must be stated in such a way as to explain the following two facts:

- (20) a. which that and whom that sequences disappeared from the language after Stage 1
 b. Although nominative who came to be used as a relative pronoun, the sequence who (relative pronoun) that never occurs

Both of these facts follow if we suppose that an output condition of the form given in (21) was added to English

- (21) No clause may contain a relative pronoun directly followed by that.

We have already seen that in Stage 1 two rules existed; namely, relative pronoun deletion and that-deletion. We have also seen that the evidence in Stage 1 is consistent with the supposition that both of these rules are optional. Since both rules are optional, it is not surprising to find sentences like (19) in which sequences like which that occur in the surface string. Such strings could only result from not applying either of the optional rules of relative pronoun deletion or that-deletion. Now observe that the effect of condition (21) is to insure that at least one of these rules will apply to any given relative clause. That is, forbidding a sequence which that in the surface string is formally accomplished by applying at least one (and maybe both) of the optional rules of relative clause formation and that-deletion. Thus, we see how the addition of (21) to a grammar of English will bring about the state of affairs described in (20a). I now turn to (20b).

The problem here is to account for the rather peculiar fact that whereas whom that and which that occurred at one stage of English and then subsequently disappeared, who that never occurred at all in the language. Rather what happened was that at the same time that whom that and which that disappeared who appeared in the language. While I have no explanation for why the nominative who appeared later than whom and which as part of the register of relative pronouns in English, there is already at hand an explanation for the fact that when who was so introduced, it only appeared as who and never as who that. To account for this we need only say that condition (21) was added to English before who was added to the register of relative pronouns. Such an account, summarized in (22) below, automatically explains why who that never occurs and why whom that and which that ceased to occur.

- (22) 1. Stage 1 (as in (18))
 2. Stage 2
 i. Stage 1 to which as been added (21)
 3. Stage 3
 i. Stage 2 to which has been introduced who as a relative pronoun

At this point I shall consider a parallel set of constructions in English of an earlier stage which provides further corroboration of an historical account of English incorporating some such device as (21). Throughout all of the stages in (22) there has been an additional set of constructions in which that optionally follows an introductory prepositional or adverbial conjunction. The following sentences from Poutsma (1916, I, 2nd half, 672 ff) are illustrative.

- (23) 1. Or whether that such cowards ought to wear this ornament of knighthood (Sh. H.VI A. iv, 1, 28)

2. Wel oghte a man avysed for to be when that he broghthe into his privetee (A.Kn. 4334)
3. Why that the naked, poor and mangled Peace (H.V.v,2,34)
4. He marked with a mysterious air that he had heard a medical man...say how that snuff-taking was bad for the eyes. (Dickens, Nicholas Nickelby, ch.v, 72a)
5. While that the armed band doth fight abroad (H.V.1,2,178)
6. When that the poor have cried, Caesar hath wept (JC III, 2, 96)

In (23) the adverbs, when, why, how, while and the special form whether are all illustrated with that following. In addition, Poutsma observes that a group of words which he calls conjunctives, including the group in (23), occur with following that down to the Stuart period, i.e. roughly the end of the 17th century and the beginning of the 18th century. These include the following:

- (24)
1. after that
 2. before that
 3. but that
 4. by that
 5. for that
 6. until that
 7. if that
 8. though that
 9. now that
 10. since that
 11. ere that
 12. except that
 13. by the time that

Examples of such sequences abound in the literature and we list just a few drawn from Poutsma (op.cit.):

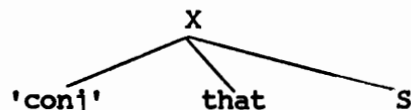
- (25)
- a. Before that Philip called them, I saw thee. Bible, John 1, 48
 - b. By that these Pilgrims had been at this place a week, Mercy had a visitor. Bunyan, Pilg.Prog. II, 82
 - c. Doth it not flow as hugely as the sea, Till that the seary very means do ebb? Sh. As you like it, II,7,73

In giving an historical account of English it is clear that to a great extent the sequences listed in (24) and those illustrated in (23) and (25) have been greatly simplified, though, of course, some of the sequences persist until today. Consider, for example, (26)

- (26) O to be a metope now that triglyphs here (e.e. cummings
Memorabilia)

In accounting for the simplification that has taken place from Middle English times to the present, Klima (1964, 280 ff) postulates an underlying structure for subordinate clauses, including relative clauses, of the form:

(27)



where X stands for any subordinate node, 'conj' stands for the full class of subordinate conjunctions, including those listed in (24) and illustrated in (23) and (25). In addition he supposes a rule which optionally deletes that after a member of the class 'conj'. To account for the drastic reduction in such sequences he assumes that this rule becomes obligatory and that, even later, the phrase structure was re-analysed to eliminate that altogether from underlying trees like that in (27).

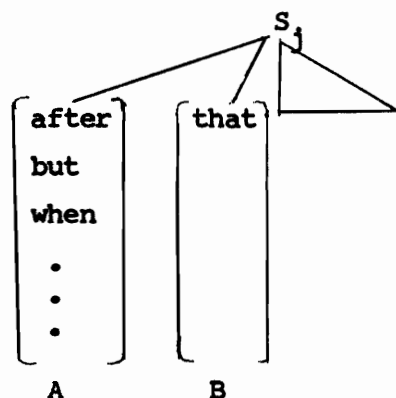
This is, of course, a perfectly plausible explanation of the history of these sequences. We are, however, in possession of an additional piece of theoretical machinery, namely an output condition like that of (21) and it is reasonable to ask whether the facts of (23) through (25) can be dealt with in terms of this condition.

Let us repeat (21):

- (21) No clause may contain a relative pronoun directly followed by that.

At this point let us ask whether there is any common element that one can find to relate (21) to the sequences in (23), (24) and (25). There is, of course, one common element; namely, relative pronouns, like conjunctions (such as after, though, since) and like adverbials (such as when, how, why) all occur in clause initial position. What this suggests is that the constraint (21) which, we hypothesized, entered the language at Stage 1 to produce Stage 2 may subsequently have been generalised so that what was prohibited was not simply sequences of relative pronouns + that but sequences consisting of any morphological element + that at the beginning of the same clause. Represented schematically this constraint would appear to eliminate clauses in which constituents occupied both the A and the B position in (28):

(28)



To capture what is represented schematically in (28), we might suppose that after Stage 3, (21) was generalized as follows:

(29) No clause may contain anything followed by that.

Thus, we would account for the disappearance by the Stuart period of sequences like after that, when that, etc. by supposing the following events:

- (30)
1. Stage 1 (as in (18))
 2. Stage 2
 - i. Stage 1 to which has been added (21)
 3. Stage 3
 - i. Stage 2 to which has been added nominative who as a relative pronoun
 4. Stage 4
 - i. Stage 3 with (21) generalized to (29)

The account given in (30) enables us to correlate, as seems intuitively desirable, the loss of sequences like those in (24) with the loss of sequences like which that and whom that.⁴ There is a further property of Stage 4 which needs some discussion, and that is that it is obviously not a stable stage of linguistic development. The reason is quite simply that a constraint like (29) will have the effect of eliminating almost all of the occurrences of that following a subordinate conjunction. The reason why the preceding statement is qualified by "almost" is because while English at all of the stages we have considered had both a that deletion and a relative pronoun deletion rule, it did not have a rule to delete words like after, for, since, etc.

As a consequence the only way for a grammar at Stage 4 to meet the condition (29) is by deleting all occurrences of that, save those which occur after a relative pronoun. In the latter case the condition can be met either by deleting the pronoun or that, but in all other cases that must be deleted.

An immediate consequence of this is that a child learning the output of Stage 4 would have no reason to postulate an underlying that in subordinate clauses introduced by the forms in (23), (24) and (25) since that would never occur after those forms in the data. On the other hand, the child would certainly have motivation to postulate that in relative clauses since the random operation in Stage 4 of relative pronoun deletion or that deletion would provide some sentences with an initial that. It follows, of course, that at this subsequent stage not only will that be deleted from the clause initial position of subordinate clauses other than relative clauses, but that condition (29) will return to its earlier form (21). Thus we postulate after Stage 4 in (30), the following stages:

- (31)
- Stage 5
 - i. Elimination of that from all subordinate clauses introduced by clause initial morphemes with the exception of relative clauses.
 - Stage 6 (= Stage 3)
 - i. that as a marker on all subordinate (including restrictive relative) clauses other than those in (i)
 - ii. Constraint (21)⁵

I began by showing that the structure-preserving hypothesis apparently

fails to account for the facts of Middle English. An alternative hypothesis was then presented which accounted for Middle English and which also provided a natural explanation for subsequent stages of the language down to Stage 6 in (31). If this account is not to be subject to the same criticism as that leveled against the structure-preserving hypothesis, it must be possible to show that Stage 6 is essentially that of contemporary English. If this can be shown, then it will have been successful in demonstrating that a single theoretical device, namely an output condition like (21) is sufficient to account for all stages of English from Middle English to the present. I turn now to a demonstration that (21) is necessary for contemporary English.

Contemporary English and Constraint (21)

Constraint (21) involves the interaction of two separate rules, wh-fronting and that-deletion. In this section I shall discuss each of these rules in turn, touching on certain aspects of them which are relevant to my argument and then I shall show how constraint (21) operates to insure that at least one of these rules applies in a relative clause. I consider first wh-fronting.

The major difference between Emonds' account of relativization and that given in (1) above has to do with deletion of the relative pronoun. Thus, according to Emonds relative pronouns are deleted only if they are not fronted while according to (1) relative pronouns are first fronted and then deleted. Let us now consider some evidence in favor of the view that relative pronouns must first be fronted before being deleted. In Postal (1971) the following sentences appear:

- (32) a. *The astronaut_i who_i his_i mother claimed was a psychotic was arrested.
 b. *The astronaut_i his_i mother claimed was a psychotic was arrested.
 c. *An engineer_i who_i Mary claimed his_i mother refuses to let out after_i dark arrived.
 d. *An engineer_i Mary claimed his_i mother refuses to let out after dark arrived.

In part to account for the ungrammaticality of these sentences Postal postulates a Wh-Constraint which, very roughly, states that a wh-form coreferential with some pronoun which occurs to the right of the pronoun just prior to the operation of wh-movement rules and which ends up to the left of that pronoun after wh-movement will, by so doing, produce an ungrammatical sentence. Thus, before wh-movement we would have, corresponding to (32a), the following string:

- (33) a. The astronaut_i his_i mother claimed the astronaut_i was a psychotic was arrested.

which becomes by relative clause formation

- b. The astronaut_i his_i mother claimed who_i was a psychotic was arrested.

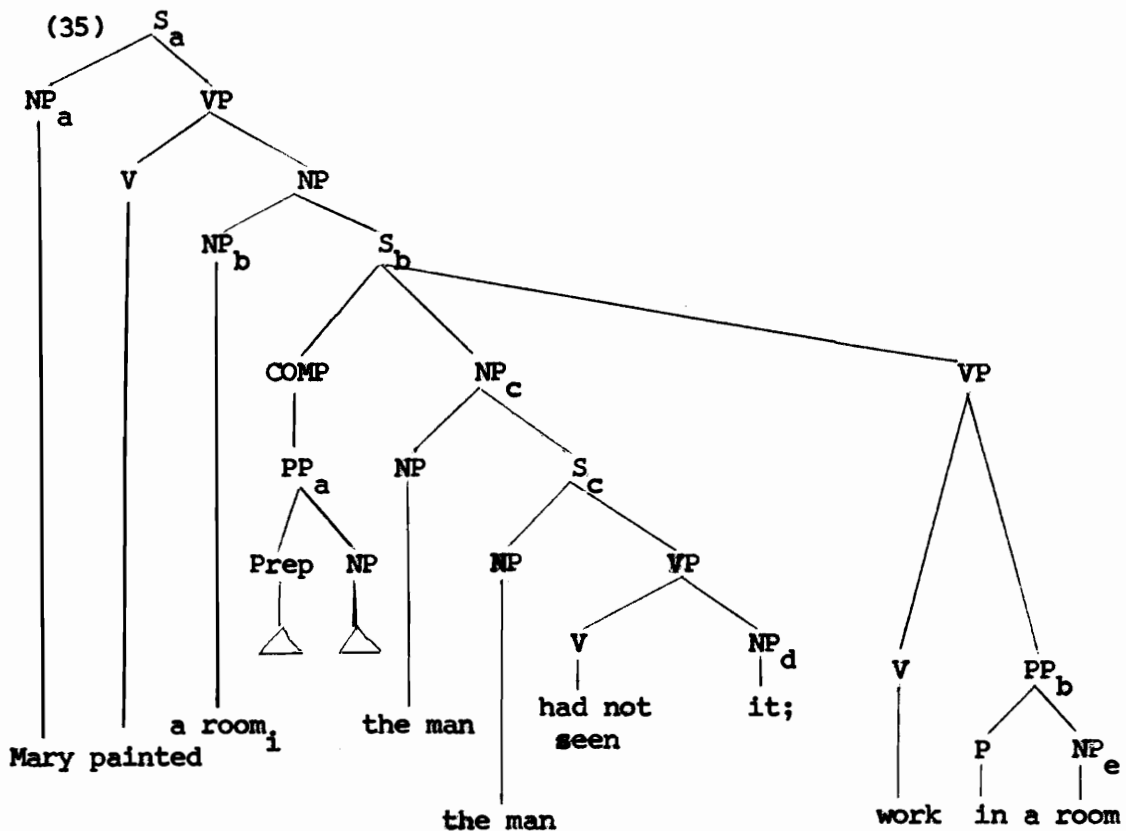
Then, the fronting of the relative pronoun in (33b) yields (32a),

but since, according to Postal, the fronting gives rise to a situation in which a relative pronoun to the right of a coreferential pronoun just before wh-movement ends up to its left, the resultant sentence is ungrammatical.⁶ If we accept Postal's account of the ungrammaticality of (32a) and, analogously (32c), then we are now in a position to argue that the relative clause pronoun is always fronted. To see this, consider the sentences (32b) and (32d) which correspond to (32a) and (32c). These sentences have obviously undergone relative pronoun deletion. They are, however, still ungrammatical. If the relative pronoun is assumed to have been deleted because it was not fronted (in line with the second of the two possible solutions suggested above), then we cannot account for the ungrammaticality of (32b) and (32d) in the same way that we can account for the ungrammaticality of (32a) and (32c). If, however, we suppose that the relative pronoun has been fronted and then deleted in (32b) and (32d) we can account for the ungrammaticality of all the sentences in (32) in the same way. Since the latter is obviously the more desirable alternative, it follows that we must suppose that relative pronouns are always fronted and then, optionally, deleted.⁷

Let us consider a second argument in favor of wh-fronting before deletion. Consider the ungrammatical sentence:

(34) *Mary painted a room for the man who had not seen it to work in.

According to Emonds, this sentence should be grammatical. To see this let us consider its structure in terms of his framework:



It is clear from inspection of the tree in (35) that NP_a and NP_c are not identical. In this situation, according to Emonds, NP_c must move into the empty NP node dominated by $COMP$ (cf. (11)). In this case, however, PP_b is prevented from replacing PP_a in accordance with the structure-preserving hypothesis. Thus, NP_a must be deleted to yield (34). But this, as we have seen is an ungrammatical sentence.

For this reason it is important to note that (34) can be blocked in terms of a theory of relativization (like (1)) in which wh-fronting takes place first and a wh-word is then deleted. We already have a device sufficient to do this; namely Postal's Wh-Constraint, which rules out the fronting of NP in (35). This is because just prior to fronting, NP will end up to the left of NP_d , and it is precisely this situation that Postal's Constraint claims yields ungrammatical sentences. Notice that if we replace NP_d by an NP which is not coreferential with NP_e or if we replace the VP_d in S_c by an intransitive VP , the resultant sentences are acceptable:

- (36) a. Mary painted a room for the man who liked colorful walls to work in.
 b. Mary painted a room for the man who died to work in.

These sentences show that the ungrammaticality of (34) is not relatable to S_c but rather depends strictly upon whether S_c contains an NP coreferential with an NP to the right prior to the operation of wh-fronting.⁸

Assuming, then, a theory of relativization in which wh-fronting always takes place prior to wh-deletion, a word must be said about the conditions for its deletion. It was pointed out earlier that whenever a relative pronoun is fronted along with a preposition, it may not delete (cf. (6b) and (6d)) while if it is fronted alone it may delete (cf. (6a) and (6c)). In order to account for this we must suppose the following condition:

- (37) a relative pronoun may only delete when it is in absolute clause initial position; that is, it may only delete just in case it is the first word in its clause.

This condition will correctly account for the pattern of grammaticality in (6) above.⁹

I now turn to the rule of that-deletion. This rule is motivated by such sentences as:

- (38) a. He knew that she could see him.
 b. He knew she could see him.
 c. He liked the way that they did it.
 d. He liked the way they did it.

To begin with, it is quite clear on intuitive grounds that (38a,c) are closely related to (38b,d), respectively. This relationship can be captured by supposing a that-deletion rule which deletes clause initial that, the marker of sentence subordination.¹⁰ At first glance, one might want to say that a generalization is being missed since relative pronoun deletion also takes place in sentence initial position. That is, one might want to suggest that the same rule is operating in

(38b,d) as in (6a,c) above.

In order to make this suggestion go through one would have to argue that there is actually a respelling rule which respells who and which as that in absolute clause initial position and that there is, therefore, only a that-deletion rule and not a relative pronoun deletion rule in English. (In this case (37) would be a condition on a respelling rule.) Notice that the sentences in (38) are sufficient to motivate a that-deletion rule independent of who and which since there is no question of there being a relative pronoun in the source of the sentences in (38). This is *prima facie* true of (38a,b) and is demonstrated in the case of (38c,d) by the ungrammaticality of:

(39) *He liked the way which they did it.

Thus, the putative source of (38c) is ungrammatical and this fact argues against its participation in a respelling rule which would derive (38c) from (39).

However, consider sentences like these:

- (40) a. She liked the man who she spoke to.
 b. She liked the man that she spoke to.
 c. She liked the man she spoke to.

Assuming a respelling rule in accord with condition (37), (40b) would derive from (40a) by respelling and (40c) from (40b) by that-deletion.

There are several arguments against a respelling rule, however. First, a respelling rule of the sort suggested would formally be identical to a respelling rule in which the relative pronouns are replaced by some other word, e.g. thwart or dingus. In other words, the respelling rule requires that we treat it as mere coincidence that the respelling of who and which takes the form of a word which, in other constructions in English (cf. (38)), is used to mark sentence subordination, i.e. that.

Second, the respelling hypothesis requires that we accept a second coincidence; namely that the respelling of who and which as that may only occur in absolute clause initial position, i.e. precisely the position where, on independent grounds, we have seen that the subordinate sentence marker that occurs.

Third, it is an ad hoc fact that in the respelling of who and which as that the semantic feature of animacy and the syntactic feature of case are lost in the respelling. Moreover, it is yet another inexplicable coincidence that the respelled that, which has no semantic feature of animacy and cannot be marked for case, shares just these two properties with the subordinate marker that, under the respelling hypothesis.

Finally, a prediction made by the respelling hypothesis is that in relative clauses that and who/which must be in complementary distribution since one derives from the other. The following sentence, however, provides evidence against this view:

- (41) ?The reports that the government prescribes the height
 of the letters on the covers of which are readily available.

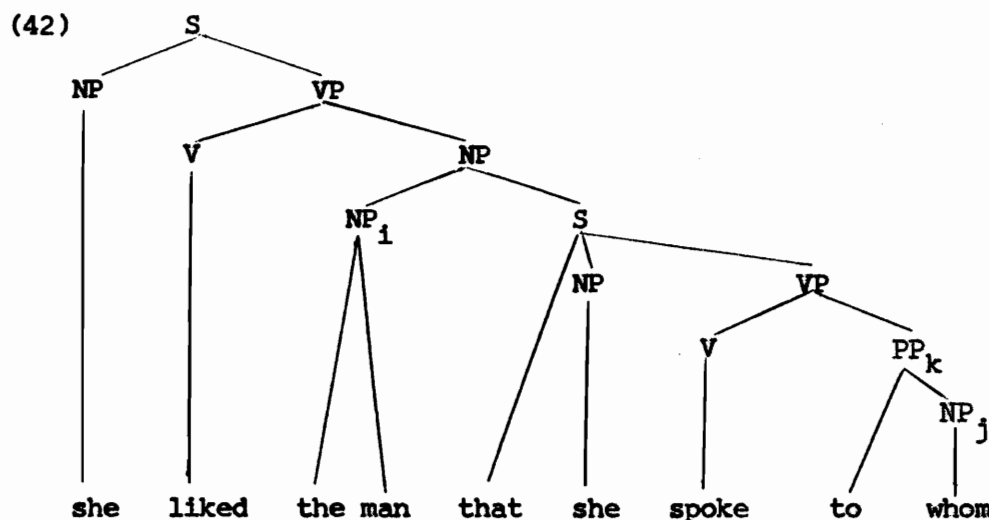
While this sentence is somewhat awkward, it does seem to be grammatical and, if it is, it constitutes direct disconfirmation of the respelling

hypothesis. In this sentence the relative pronoun has not been fronted. Therefore, respelling may not apply. Therefore, an initial that cannot be derived, contrary to (41).

In the face of the preceding arguments I shall suppose that that and who/which are independent of one another; i.e. they are not related by a spelling rule. I assume, therefore, two deletion rules, that-deletion and relative pronoun deletion (subject to (37)). And finally, I assume that both of these rules are optional.¹¹

Following Klima's (and Jespersen's) lead, then, I shall suppose that that is a mark of sentence subordination.¹² Since, moreover, it is obvious that restrictive relative clauses are subordinate clauses, it is a consequence that they are assigned an initial that.

Having assumed that restrictive relative clauses are to be introduced by that, a remote structure for a sentence such as (40a) of the following sort must now be postulated:



The tree in (42) represents that stage of the derivation of (40a) in which relative pronoun marking has introduced a relative pronoun into the subordinate clause (cf. NP₁) because of the identity at a prior stage of NP₁ with NP_j. The next stage in the derivation will produce, as a result of wh-fronting, the following strings:

- (43) a. She liked the man to whom that she spoke.
b. She liked the man whom that she spoke to.

(43a) results from moving the entire PP_k; (43b) by leaving the preposition behind. Recall, now that we have two deletion rules, one which deletes that, the other which deletes a relative pronoun in absolute clause initial position. The operation of these rules on the string in (43) is illustrated below:

- (44) a. She liked the man to whom she spoke.
(by that deletion to (43a))
b. She liked the man whom she spoke to.
(by that deletion to (43b))

- c. She liked the man that she spoke to.
(by whom deletion to (43b))
- d. She liked the man she spoke to.
(by whom deletion and by that deletion to (43b))

The operation of both rules to (43a) is not possible since preposing of the preposition along with whom in this string leaves whom in clause non-initial position so that the environment for who/which deletion is not met.

But now recall that both that deletion and who/which deletion are optional rules. For this reason there are two strings which can be derived in terms of the framework adopted thus far which are in fact ungrammatical. These are, of course, the strings in (43); namely, those to which neither deletion rule has applied. The grammaticality of (44) and the nongrammaticality of (43) must somehow be accounted for. What immediately separates these two sets of examples is the fact that at least one of the deletion rules has applied in the derivations of (44) while none have applied to those in (43). We can capture these facts if we add to the theoretical framework an output condition which requires that at least one of the deletion rules apply;

- (45) No clause may contain a relative pronoun directly followed by that.

But (45) is identical to Constraint (21), precisely the constraint which played a role in the history and evolution of English. We have managed, then, to show that the same theoretical device is independently motivated for Middle English, early Modern English and for contemporary English. Before considering the significance of this, let us look at additional evidence in favor of Constraint (45) (= (21)) in contemporary English. The following sentences are relevant.

- (46) a. The reports which the government prescribes the height of the letters on the covers of are readily available.
- b. The reports that the government prescribes the height of the letters on the covers of are readily available.
- c. The reports the government prescribes the height of the letters on the covers of are readily available.
- d. The reports of which the government prescribes the height of the letters on the covers are readily available.
- e. The reports the covers of which the government prescribes the height of the letters on are readily available.
- f. The reports the letters on the covers of which the government prescribes the height of are readily available.
- g. The reports the height of the letters on the covers of which the government prescribes are readily available.

Sentences (46a-c) parallel (44b-d), i.e. the relative pronoun which has moved into absolute clause initial position so that either deletion rule or both may apply. That-deletion yields (46a), which-deletion (46b), that-deletion and which-deletion (46c). When we come to (46d-g), however,

we find that the principle of Pied Piping has operated to produce sentences in which the relative pronoun, though moved forward, is accompanied by several noun phrases which separate it from absolute clause initial position.¹³ As a consequence, given (45) one would predict that in these cases only that deletion can apply and, indeed, must apply. This prediction is borne out. In other words, the fact that the operation of Pied Piping correlates with the obligatory deletion of that is accounted for in a grammar which includes constraint (45). It also follows, of course, that the failure to delete that in (40d-g) will yield ungrammatical strings:

- (47) a. *The reports of which that the government prescribes...
 b. *The reports the covers of which that the government prescribes...
 c. *The reports the letters on the covers of which that the government prescribes...
 d. *The reports the height of the letters on the covers of which that the government prescribes...

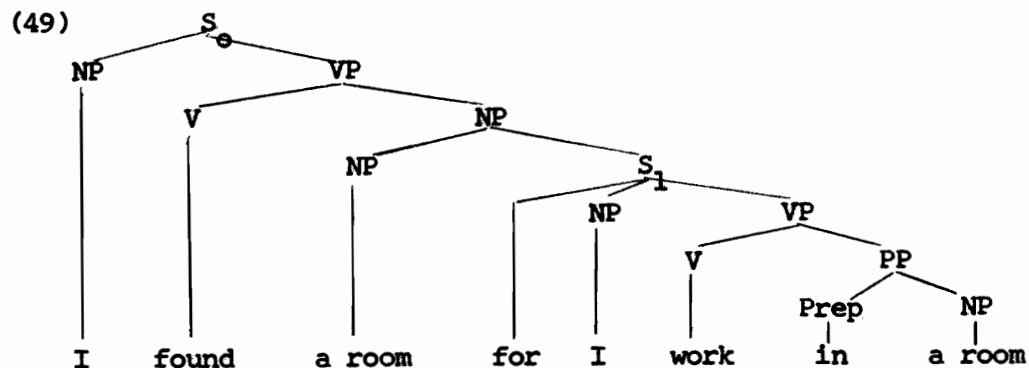
The sentences in (46) and (47), then, provide independent corroboration for Constraint (45).

Let us consider one final set of examples which seem to interact with (45); namely, the infinitival relative clauses dealt with by Emonds and listed in (9) above. I repeat them here:

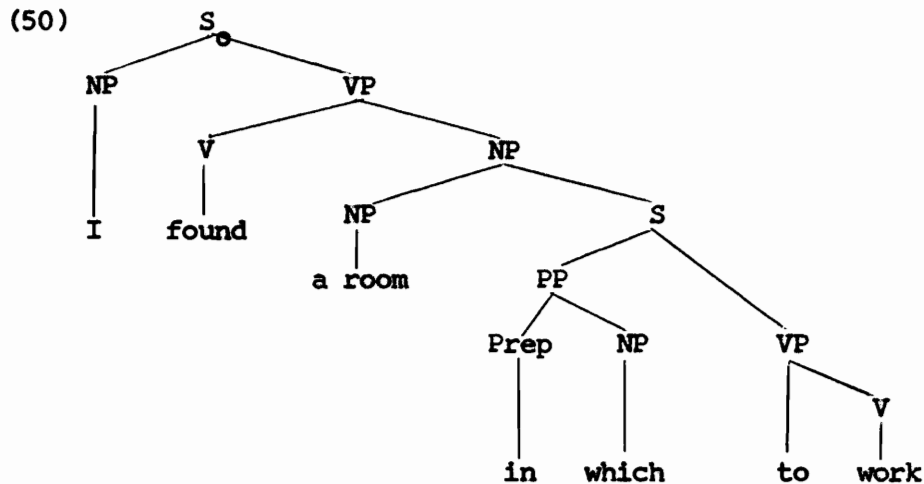
- (48) a. I found a room in which to work.
 b. *I found a room in which for John to work.
 c. *I found a room which for John to work in.
 d. I found a room to work in.
 e. I found a room for John to work in.
 f. *I found a room which John to work in.

It is obvious by inspection that Constraint (45) will not apply to these sentences since it deals only with relative pronouns and the subordinate marker that. But what is of some interest is that if Constraint (45) is complicated somewhat, then it can account for all of the sentences in (48) except (48f) and there is a certain amount of evidence which suggests that (48f) should be handled differently.

Let us consider, first, (48a-e). To begin with we represent the tree underlying the sentences in (48) as:



To derive (48d) I would assume that the NP a room of S_1 is replaced by the relative pronoun which which is subsequently fronted and deleted. To derive (48a) I assume that which is fronted along with its accompanying preposition in so that it cannot be deleted. Two additional rules must operate in the derivation of (48a,d) from (49) and I mention them in passing, though justification for them will not be given. The rules are Equi-NP Deletion which deletes a subject NP of an embedded S under identity with an NP in the higher S, in this case the subject of S_0 .¹⁴ I further assume that an automatic consequence of for complementation is the appearance of the infinitive marker to in the embedded sentence. (for some additional comments on infinitivization see Kiparsky and Kiparsky (1970).) A subsequent rule of Preposition Deletion will delete for when it occurs immediately adjacent to the infinitival marker to.¹⁵ The resultant tree after all this is:



But now consider some difficulties with this analysis. To begin with, notice that the occurrence in remote structure of identical NP's in the subject position of the matrix and constituent sentences is not a deep structure constraint in the sense of Perlmutter (1970). Thus the grammaticality of (48e), in which the subject of the matrix and embedded clauses are different, shows that they need not be identical in deep structure. Secondly, the grammaticality of (48a) shows that a relative pronoun and an accompanying preposition may be fronted. However, when a relative pronoun and an accompanying preposition are fronted in an embedded clause whose subject is not identical with the matrix subject an ungrammatical sentence results, namely, (48b). And there is no explanation for this fact in terms of the framework considered thus far. Equally difficult is the ungrammaticality of (48c) in which the subjects of the matrix and embedded clauses differ and in which only the relative pronoun has been fronted. There is no apparent explanation for this either.

Now what is striking about the pattern of acceptability of (48a-e) is that it can be accounted for precisely if one supposes with Emonds that for in these sentences is a mark of sentence subordination, i.e. that it is like that.¹⁶ Thus, with this assumption, we are able to modify Constraint (45) as follows:

- (51) No clause may contain a relative pronoun directly followed by the subordinate markers that or for.

Let us see how this modified constraint operates on the sentences in (48).

To begin with, assuming a deep structure like (49) there is no problem in deriving (48a) in the fashion already described above. That is, in which is fronted and since which is not the first word in the clause, it cannot be deleted. However, for is adjacent to to because of the operation of Equi-NP Deletion so that for deletes leaving the surface string in compliance with (51). Notice that the ungrammaticality of (48b) also raises no problem since the nonidentity of matrix and subordinate subjects leaves John as the embedded subject and since it intervenes between for and to, Preposition Deletion may not apply. Thus the fronting of in which puts it in a position where which may not delete leaving which and for adjacent to one another in violation of (51). In (48c) which has been fronted but not deleted so that which and for are again adjacent in violation of (51). Notice that if which had been deleted, we would expect a grammatical sentence and, in fact, we have one in (48e). In (48d), the subjects of higher and lower clauses being identical, Equi-NP Deletion has removed the lower. Moreover, the infinitive to has been introduced and, being adjacent to for, it triggers the deletion of the latter. In addition, deletion of the fronted which occurs to yield (48d). We see, then, that (48a-e) are automatically accounted for by the extension of Constraint (45)(=21) to (51).

I turn now to (48f). This string has undergone wh-fronting to leave which in initial position. It has also undergone Preposition Deletion so that the surface string does not violate (51). In terms of the framework I am arguing for, then, (48f) is problematic since my framework would declare it to be grammatical, in violation of the facts. In the face of the ungrammaticality of (48f) it is necessary to add to Constraint (51) a further apparently ad hoc condition on the rule of relative pronoun deletion, namely:

- (52) Relative pronoun deletion, normally optional, is obligatory when the relative pronoun is the first word in a tenseless clause.

The effect of (52), of course, is to make relative pronoun deletion obligatory in the case of (48f) so that (48f) is an impossible surface string in English. It is of some interest, then, to note that there is a certain amount of evidence in favor of (52) as an independent constraint in English.

Consider, first, the well known rule of Whiz Deletion. It is this rule which derives (53c) from (53a) or (53b):

- (53) a. The boys who were playing baseball scattered.
 b. The boys who are playing baseball scattered.
 c. The boys playing baseball scattered.

The derivation of (53c) comes about because of the deletion of the sequence who were/are. The fact that it is a clause initial relative

pronoun which is part of the deleted sequence has never been related to the fact that it is precisely such relative pronouns which are deleted by the independent relative pronoun deletion rule. In short, the grammar has been assumed to have two separate rules which bring about relative pronoun deletion in initial position. The postulation of condition (52) however, allows us to eliminate this redundancy.

To see this suppose Whiz Deletion is restated so that it only operates to delete some form of the verb to be which immediately follows a clause initial relative pronoun:

(54) Be Deletion

X	NP	[NP-S	[rel. pron. - BE - Y]	S]	NP	Z
1	2		3		4		5			=>
1	2		3		∅		5			

The operation of this rule will derive (55c) from (55a) or (55b):

- (55) a. The boys who were playing baseball scattered.
 b. The boys who are playing baseball scattered.
 c. *The boys who playing baseball scattered.

Then, the operation of relative pronoun deletion modified by condition (52) will automatically delete the relative pronoun in (55c) to yield the well-formed (53c). In this fashion I am able to relate the ungrammaticality of (55c) to (48f) and, further, I am able to show that the deletion of the relative pronoun in truncated relative clauses is brought about by the relative pronoun deletion rule.¹⁷

Notice that the above argument predicts that relative clauses which have non-clause initial relative pronouns may not undergo Be Deletion; that is, it predicts the pattern of acceptability in (56):

- (56) a. The two boys, neither of whom were playing baseball at the time, scattered anyway.
 b. *The two boys, neither of whom playing baseball at the time, scattered anyway.

There is a related set of sentences which bears on the discussion of (52). In Ross (1971) an argument is given for the derivation of (57b) from (57a):

- (57) a. Men who sharpen knives leer at us.
 b. Men sharpening knives leer at us.

Ross proposes that these sentences be related by a rule called Stuff-ing, which operates to Chomsky adjoin ing in place of Tense to the highest V of a relative clause whose subject has been relativized. He includes in this rule the obligatory deletion of the relative pronoun:

(58) Stuff-ing

$$X - [_{NP} NP - [_{S} NP - V - Y]_{S}]_{NP} - Z$$

SD: 1 2 3 4

SC: 1 ∅ 3#ing 4

What is interesting about Stuff-ing is that, if Ross is correct in deriving (57b) from (57a), then we have yet another instance in which a relative pronoun may not stand in clause initial position of a tenseless clause. In keeping with the previous discussion, relative pronoun deletion would be separated (as indeed Ross suggests in a footnote) from the introduction of the morpheme -ing. Thus I would assume a derivation as follows:

- (59) a. Men who sharpen knives leer at us.
 b. Men who sharpening knives leer at us.
 c. Men sharpening knives leer at us.

(59a) yields (59b) by the operation of Stuff-ing modified so as only to introduce -ing while (59b) yields (59c) by the operation of relative pronoun deletion modified by condition (52).

In his discussion Ross gives a sentence which he treats as grammatical and which, therefore, lends support to his tentative suggestion that the deletion of the relative pronoun be separate from the introduction of -ing:

- (60) ?These two examples, neither of which proving much in isolation, combine to make an iron-clad argument for Precyclic Buttering.

Ross notes the failure of which to delete in (60) and since the sentence contains an -ing introduced by Stuff-ing he concludes that relative pronoun deletion should be separate.

In terms of this framework two things must be noted. First, (60) seems to me quite clearly ungrammatical and so it has to a great many informants. Second, the rule of relative pronoun deletion could not, in any case, operate in (60) since which is not in clause initial position. These two facts suggest that we modify Stuff-ing so that it introduces -ing into sentences which contain only clause initial relative pronouns:

(61) Stuff-ing (modified)
$$X [_{NP} NP - [_{S} \text{rel.pron.} - V - Y]_{S}]_{NP} - Z$$

SD: 1 2 3 4 5 =>

SC: 1 2 3 4#ing 5

So modified, (61) predicts the pattern of acceptability in (62) which precisely parallels that in (56):

- (62) a. These two examples, neither of which prove much in isolation, combine to make an iron-clad argument for Precyclic Battering.
- b. *These two examples, neither of which proving much in isolation, combine to make an iron-clad argument for Precyclic Battering.

The preceding arguments relating to (1) Whiz Deletion and (2) Stuff-ing, seem to provide a certain amount of support for condition (52) which in turn allows us to treat (48f) as a special case of relative pronoun deletion in tenseless clauses.¹⁸ Having done this, it can be shown how (45)=(21) modified as (51) will account for the interrelationship of relative pronouns and markers of subordination not only in restrictive relative clauses but in infinitival ones as well.

Before concluding, however, let us consider one further modification of Constraint (45). Consider now sentences like:

- (63) a. We discovered (that) the police know (that) Clyde shot someone.
- b. We discovered (that) the police know who Clyde shot.
- c. We discovered who the police know Clyde shot.
- d. *We discovered (that) the police know who that Clyde shot.
- e. *We discovered who that the police know Clyde shot.

Suppose we replace someone in (63a) by the interrogative pronoun who. In Baker (1970) evidence is given that the interrogative who can move up a tree as in (63b) and (63c). (63a) shows that the subordinate sentences into which who moves contain a subordinate marker that. We find, then, that we are confronted in (63) with a set of sequences similar to those in restrictive relative clauses (cf. (43)). That is, while the subordinate marker that is optional in these sentences (as (63a) shows), if an interrogative pronoun has moved up adjacent to that, the that must delete; otherwise ungrammatical sentences arise, i.e. (63d,e).

It is obvious that we are dealing with the same phenomena in (63) as we are in (43). It is equally obvious that Constraint (45) will not in its present form apply to the sentences in (63). Let us consider a modification of Constraint (45). First, in order to allow it to apply to interrogative pronouns as well as relative pronouns, the constraint will refer to wh-words in general; that is, any NP fully spelled as who or which. (I exclude NPs like which book or whose mother since the NP is not exhausted by the wh-word.) Given this (45) is modified as:

- (64) No clause may contain a wh-word directly followed by the subordinate markers that or for.

So stated, (64) will not only cause deletion of either a relative pronoun or that but it will also cause deletion of that in the sentences in (63), there being no interrogative pronoun deletion rule in English.

But now consider the following sentence:

- (65) Who that is from Philadelphia do you know?

This question is well-formed and yet it apparently violates (64). The reason is that it contains a wh-word directly followed by a subordinate marker that. What distinguishes (65) from every other case we have considered thus far, however, is that in (65) who and that are not in the same clause. They are not, to use Postal's terminology, clausemates. Notice that in the restrictive relative clauses in (43) and (46), in the infinitival relative clauses in (48) and in the indirect questions in (63) the wh-word is adjacent to a subordinate marker in the same clause. This suggests a final modification of (64); namely,

- (66) No clause may contain a wh-word directly followed by the subordinate markers that or for as clausemates.

Conclusion

I have tried to demonstrate that an output constraint like (66) is needed not only for contemporary English, but also for a coherent account of the earlier stages of the language leading up to Modern English. If my account is correct, then one interesting result is that linguistic change has come about, not through the modification of rules, but rather through the modification of permissible outputs of a given set of rules. This result raises an even more interesting question: is it possible to characterize the class of possible modifications that a grammar can undergo so that one can predict whether a given modification will be expressible as a rule rather than an output condition and vice versa. In this regard it is suggestive that given an output condition like (66) it is possible to state the that-deletion and relative pronoun deletion rule in a maximally simple fashion; that is, both rules apply optionally just in case the deletable word is in absolute clause initial position with the further modification that the relative pronoun must delete if the clause is tenseless. Without an output condition, it would be necessary to complicate the rule of relative pronoun deletion and that-deletion in order to insure their proper interrelationship. It may just be that in the case I have been examining output conditions rather than conditions on rules provide the simplest solution in terms of some syntactic metric which as yet is only dimly perceived.

Footnotes

*The author wishes to express his thanks to Morris Halle, Paul Postal, David Vetter and to the students and colleagues at University College London and the University of Massachusetts at Amherst for many stimulating comments and suggestions. The views which have found expression here are not necessarily shared by them. The historical discussion which follows owes a great deal to the treatment of relative clauses and subordination in Klima (1964a) and in particular to Section XII "Diachronic Considerations Touching Subordinator That". My debt to Klima's groundbreaking work will be apparent to anyone familiar with his thesis. This work is in part sponsored by National Science Foundation Grant No. 3179 to Brandeis University.

1. Emonds (1970,206) identifies a third class of transformations, minor movement rules, which he defines as follows: "A minor movement rule is a transformation which moves a specified constituent B over a single adjacent constituent C." In the discussion which follows the rules we consider are clearly not of this class.

2. For an argument that constraining transformational grammars as Emonds does does not restrict their weak generative capacity, see Kravif (1971,112-114).

3. The limitation is due to the fact that the nominative who does not yet appear in the language. For a discussion of another aspect of relative clauses at this point in time see Bever and Langendoen (1971).

4. There is yet a deeper level of explanation suggested by the account in (30) but for which I have no answer at present. In particular, I would like to know why Constraint (21) appeared. It is attractive to suppose that its addition is an attempt to reduce redundancy created by having two items which mark a clause initial position in subordinate clauses where one is sufficient. But the language tolerates redundancy elsewhere, so why it should be vulnerable at this point is not clear. For some speculation on this point see the conclusion below.

5. There are still a certain number of subordinate conjunctions + that in the language; for example, now that, but that, so that, in order that, in that. These are sufficient to bar the adoption into contemporary English of constraint (29) rather than (21), since (29) claims that no lexical item may precede that whereas (21) claims that no relative pronoun may precede that. These forms constitute counter-examples to (29). We might well ask why they are in the language today at all if (29) existed at the end of the Stuart period. There seems to be no treatment of these forms other than to consider them as exceptions. This I shall do by analyzing them as compound conjunctions in contemporary English, rather like although or whenever. Notice that this would account for the fact that that may never delete in the compound subordinate conjunctions in order that (*in order), in that (*in), and but that (*but, i.e. in the same sense as but that). However, both now that and so that have variants without the that; namely, now and so.

I shall suppose then that this small residue from earlier times is to be analyzed as follows: (1) a group of compound conjunctions in which

that never deletes; e.g. in order that, but that, in that and (2) a group of compound conjunctions which also have non-compound variants, i.e. now that beside now and so that beside so. These latter, it is to be stressed, are not derived by deletion. It is clear that in the overwhelming number of cases that had been eliminated historically.

6. Notice that Postal's Constraint predicts that the passive version of (32a) should be acceptable. That sentence is:

- i. The astronaut_i who_i was claimed by his_i mother to be a psychotic was arrested.

This follows because the relative clause [his_i mother claimed the astronaut_i was psychotic] becomes, under Passive, [the astronaut_i was claimed to be psychotic by his_i mother]. Now, when this string undergoes relative clause formation, i.e. when it is embedded as in the S [the astronaut_i [who_i was claimed to be psychotic by his_i mother]_S was arrested]_S the relationship of the relevant NP's does not run afoul of Postal's Constraint. The relevant pronoun-NP pair is who_i and his_i. However, at the point just prior to the operation of wh-movement rules, who_i stands to the left of his_i. This is because of the prior operation of Passive, so Postal's Constraint does not apply. Notice that in the deep structure the NP underlying who_i stands to the right of his_i. But Postal's Constraint is not a deep structure constraint. Rather it operates on strings just prior to and just after the operation of wh-movement. It is for this reason what (32a) is out but (i) is not.

7. There appears to be a real dialectal difference among speakers of English with respect to Postal's Constraint. Needless to say, the arguments given above hold only for those speakers who share the Wh-Constraint.

8. I am indebted to P. Postal for this argument.

9. Notice that deletion of the relative pronoun in noun phrases like [whose mother]_{NP} does not occur. This seems to be the result of a special fact of English; namely, nominally embedded left-handed genitive phrases do not in general delete. Compare, for example:

- i. A friend (of Joan's) called Joan.
- ii. *(Joan's) friend called Joan.

I assume that this prohibition prevents relative pronoun deletion from applying in sentences like:

- iii. The man whose mother I know came in.

10. The precise nature of this rule is unclear as indicated by such sentences as:

- i. John chortled that Bill was a silly goose.
- i'. *John chortled Bill was a silly goose.
- ii. John groaned that Bill was a silly goose.
- ii'. *John groaned Bill was a silly goose.

Verbs such as chortle, groan, mumble, etc., which Zwicky (1971) refers to as manner-of-speaking verbs do not admit of that-deletion and whether

this fact has some deeper significance is not clear at this point.

11. This view, of course, is not an original one. For example, Klima (1964a,b) argued that the that at the beginning of relative clauses should be identified with the that at the beginning of other types of subordinate clauses. He noted the deletion of that in sentences like (38b) from sources like (38a) and called attention to the parallel with sentences like (40c) derived by that deletion from (40b). Besides these examples, taken from Klima, he also offered the following sentences to illustrate additional formations in Modern English which exhibit that as a subordinate marker:

i. He is better off, now that she is gone.

ii. But that he might do it, I would leave.

12. The possibility of analyzing that as a relative conjunction rather than as a relative pronoun was raised earlier by Otto Jespersen (1924, 85): "Indeed it may be questioned whether E. that is not the conjunction rather than the pronoun; compare the possibility of omitting that: I know the man (that) you mentioned and I know (that) you mentioned the man, and the impossibility of having a preposition before that: the man that you spoke about as against the man about whom you spoke."

The interpretation of that as a conjunction has been a matter of some debate among historians of English. Thus Poutsma (1926, Part II, 824) acknowledges Jespersen's analysis but in the end rejects it: "That as a conjunctive word is used to introduce a subordinate statement, an adnominal clause, and a variety of adverbial clauses. In the first and the third case it is universally held to be a conjunction; in the second it is generally considered a relative pronoun in its more usual application as in This is the man that told me this. This view is unexceptionable so far as subordinate statements or adverbial clauses are concerned, but is to be accepted with some reserve as regards adnominal clauses of the above type. In this function it is, no doubt, more than a mere link-word: it is an integral part of the adnominal clause in which it distinctly represents a notion indicated by some word (-group) in the head-clause; it stands in the same grammatical relation to the other elements of the adnominal clause as who or which, but it differs from these relatives in that it does not admit of being preceded by a preposition: like as, it requires the preposition by which it is governed to be shifted to the end of the sentence. This last feature tinges it with the nature of a conjunction, but, on the strength of its other grammatical characteristics being the same as those of who and which, it is best regarded as a relative pronoun." Thus Poutsma takes note of the arguments for treating that as a complementizer but in the end rejects them.

In the same passage Poutsma adds some remarks which are of some interest (op.cit.): "The reason why the relative that bears some resemblance to the conjunction that is not far to seek: the development being practically the same in the two functions. The conjunction that goes back to the demonstrative that which refers to a particular word (-group). Thus We all know that (now this): he once lived here became We all know that he once lived here. Similarly He came to a river;

that (or this) was broad and deep became He came to a river that was broad and deep."

13. The notion of Pied Piping was first introduced by Ross (see Ross 1967, 196 ff). Further observations on this principle appear in Postal (1972).

14. See Postal (1970) for a discussion of Equi-NP deletion.

15. For a discussion of Preposition Deletion see Rosenbaum (1967).

16. Notice that if in English that is a marker of subordination, then one would naturally expect it to be in complementary distribution with the infinitive to of infinitival clauses and with ing clauses as well:

- i. I found a room that I can work in.
- ii. I found a room to work in.
- iii. *I found a room that to work in.
- iv. A man owing a thousand dollars would be uncomfortable.
- v. *A man that owing a thousand dollars would be uncomfortable.

These facts follow if we assume that that, to, and ing, each introduces its own kind of subordinate clause.

17. In Ross (1971) a rule of Being Deletion is postulated to account in part for the following sentences:

- i. Anyone who is undernourished will be treated.
- ii. *Anyone being undernourished will be treated.
- iii. Anyone undernourished will be treated.

According to Ross (ii) is derived from (i) by a prior rule called Stuff-ing (see below) which replaces the tense marker in (i) by ing and which obligatorily deletes who. The ungrammaticality of (ii), however, necessitates the further postulating of a Being Deletion rule to produce (iii) from (ii). Ross goes on to note that sentences like:

- iv. Anyone being sassy will be horsewhipped.

are similarly derived. He calls attention to:

- v. Anyone who is being sassy will be horsewhipped.
- vi. *Anyone being being sassy will be horsewhipped.

Stuff-ing will derive (vi) from (v) and Being Deletion will derive (iv) from (vi).

It is obvious that Ross' Being Deletion and our Be Deletion (cf. (54)) are the same rule and should in fact be collapsed. Indeed, to do so will simplify Ross' account since Being Deletion is, in itself, sufficient to account for those cases which Ross would otherwise handle with the rule of Whiz Deletion.

To collapse the two rules it is necessary to replace the 4th term in (54) (i.e. BE) by BE(ING) with the usual convention applying to the parenthesis notation; i.e. delete BE ING if it is present in a string,

otherwise delete BE. (The possibility of collapsing Whiz Deletion and Ross' Being Deletion was independently noted by Avery Andrews.)

18. Williams (1971) has given arguments against Whiz Deletion as a rule of English and, presumably, his position would extend to Stuff-ing as well. If it turns out that neither of these are rules of English, then we have no arguments for the ungrammaticality of (48f) and, therefore, our attempt to modify Constraint (45) as (51) remains unmotivated. This would not, however, cast doubt on (45) itself. It would only diminish its range of applicability in English.

It should be noted here that the similarity between the rules of Be Deletion and Stuff-ing as stated above is suspicious and suggests that a deeper generalization is being missed. In this regard see especially Williams (1971).

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