RULE ORDERING IN TRANSFORMATIONAL GRAMMAR

W.L. Bonney

University of Sydney

Transformation rules cannot in general, be made to apply simultaneously because at least in the standard analyses, there are many cases where the applicability of some rule A is contingent upon the prior application of some other rule B which has the effect of creating an input structure for A. For example, consider the derivation of the sentence (1) from base tree (2) :

(1)   Fred is believed by Tom to be sick
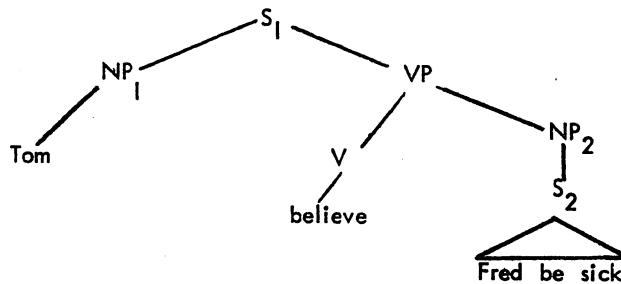
In (1) <u>believe</u> is passive, but the only operation of the passive transformation which is immediately applicable to (2) yields not (1) but (3):

(3) That Fred is sick is believed by Tom

To get (1) it is necessary first to raise the subject of S_2, <u>Fred</u>, out of that S into second position in the VP in S_1. Then the operation of Passive on S_1 will yield (1) by interchanging <u>Tom</u> and <u>Fred</u> and leaving S_2, or what remains of it, in its original position.

In a similar way, the derivation of (4) from (5) is possible, given that Reflexivization is restricted to clause-mates, only if Subject Raising is applied to lift the subject of S_2 out of that S into S_1.

(4)   Tom believes himself to be sick
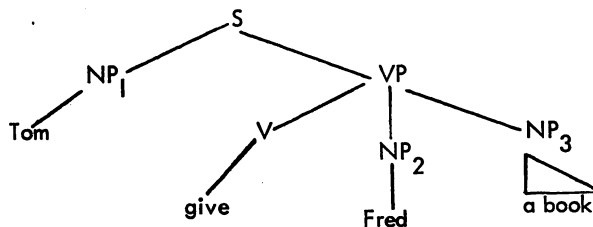
(5)

Tom believe VP NP S₂ Tom be sick
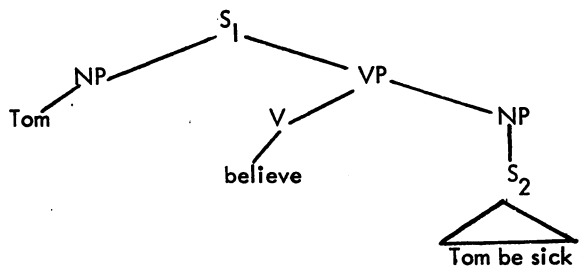
If the optional rule of Subject Raising is not applied to (5), Pronominalization will apply and yield (6) :

    (6)   Tom believes (that) he is sick.

Thus, the applicability of Reflexivization in this case depends on the prior application of Subject Raising.

    Another example concerns Dative Movement in structures such as (7)

(7)

As (7) stands, the only possible application of Passive would yield (8)

    (8)   Fred was given a book by Tom.

However, if Dative Movement is applied to (7) shifting NP_2 to the end of the VP and attaching the preposition to, subsequent application of Passive will yield (9)

    (9)   A book was given to Fred by Tom.

Passive is applicable to (7) whether or not Dative Movement is applied, but the only way to get (9) from (7) is to apply Dative Movement and then passivize.

    It is important to be clear about what is established and what is not established by examples such as these. What they establish is that transformation rules cannot in general be made to apply simultaneously; unless the theory is in some way radically modified, particular applications of some rules depend on the prior application of some other rules. What they do not establish, though they have often been thought to establish, is that an extrinsic ordering

must be imposed on the operation of transformation rules.   The order of application in the examples considered depends entirely on the form of the rules and is in that sense intrinsic. Given that the various rules are formulated in the ways I have assumed, the correct results are obtained if they are assumed to be unordered.

These examples, of course, show only that rule ordering is unnecessary in a certain very restricted area, not that it can be completely dispensed with in transformational grammar; and there are, in fact, a number of well-known data which, at least on any of the usual treatments, are most naturally accounted for by ordering the relevant rules.   One example is the case of the interaction of Pronominalization with various movement rules such as Extraposition, Adverb Preposing, WH-movement and Topicalization.   Consider sentences such as (10).

(10)   (a)   That he was elected surprised Fred
          (b)   That Fred was elected surprised him
          (c)   It surprised Fred that he was elected
          (d)   It surprised him that Fred was elected

In (a)-(c), but not in (d), the pronoun can be taken as coreferential with Fred.   We may assume, therefore, that (a)-(c) have a common source which they do not share with (d).   We must also assume that there is a movement rule applying to that-clauses which accounts for the two positions of the that-clause in (a)-(c).   The standard treatment is to say that this rule is Extraposition moving that-clauses from subject position rightwards to the end of the sentence and introducing it as the subject.   If this is the way the rule works, it is easy to show that it must be prevented from applying after Pronominalization.   For if it could apply to (b), which is the result of pronominalizing Fred in the main clause, it would generate (d) and thus wrongly provide (d) with the same source as (a)-(c).   So, pending some quite different account of the matter, we are obliged to conclude that Extraposition is ordered before Pronominalization.   The data of (10) can then be accounted for by formulating Pronominal- ization so that it can apply freely in a rightwards direction but leftwards only into a subordinate clause.

Similar arguments to this occur throughout the literature with the aim of showing that other movement rules must also be ordered before Pronominalization and that, if they are, the constraint on leftwards Pronominalization will successfully account for the data.   None of these arguments, including the one I have given, is conclusive, for they are all relative to some assumed account of what rules there are.   For example, they all assume, what is by no

means clear, that there is a rule of pronominalization which substitutes pronouns for full NPs. The argument I outlined also assumed that the rule which moves that-clauses is Extraposition - i.e., that the movement is rightwards. But if the movement were leftward (if, for example, Extraposition were replaced by Emond's rule of Intraposition) the ordering argument would fail. Suppose the that-clauses in (10) originate on the right (as in (c) and (d), not (a) or (b) and that the that-clause movement rule and Pronominalization are unordered. Then, the constraint on leftwards Pronominalization would allow a structure like (c) but not (d) to be derived by Pronominalization from a structure like (11)

(11)   /surprise Fred /that /Fred be elected/ / /
        S   NP S   S   NP S

If Pronominalization is applied to (11) to yield a structure like (c), it can be followed by the that-clause movement rule to yield (a). Alternatively, if the that-clause movement rule is applied to (11) before Pronominalization, subsequent application of Pronominalization will yield both (a) and (b).

It is worth commenting on an argument similar to the one just discussed, concerning the ordering of Pronominalization and Adverb Preposing, which occurs widely in the literature[1] and which is invalid. Consider sentences such as (12) :

(12)   (a) After Fred had breakfast, he went to work
        (b) After he had breakfast, Fred went to work
        (c) Fred went to work after he had breakfast
        (d) He went to work after Fred had breakfast

As with (10), (a)-(c) but not (d) allow he and Fred to be taken coreferentially. This again illustrates the constraint on leftwards Pronominalization. It applies freely in a rightwards direction, but backwards only into a subordinate clause. Now the argument is that Adverb Preposing, the rule which moves the adverbial clause leftwards, must not be allowed to apply after Pronominalization, otherwise there will be no way of deriving (a) while blocking (d). But this argument appears to work only because it assumes that the two rules must be strictly ordered. Given that assumption, then if the order is (i) Pronominalization (ii) Adverb Preposing, the generation of (a) will require the prior generation of a structure like (d), and since Adverb Preposing is optional, there will be no way of preventing (d) turning up as a sentence paired with the same base as (a)-(c). So, it is concluded, the order must be (i) Adverb Preposing (ii) Pronominalization. But this conclusion is not justified. If the two rules are unordered, then if Pronominalization is applied first, the constraint on its leftward

application will allow it to generate (c) but not (d). Then (b) can be generated by applying Adverb Preposing to (c). However, this does not make (a) underivable. For if Adverb Preposing is applied first, both (a) and (b) will be derivable by subsequent application of Pronominalization. As with that-clauses, if the movement of adverbial clauses is leftwards, as it is usually taken to be, the movement rule can be unordered with respect to Pronominal- ization. The ordering argument holds in these cases only if the movement is to the right.

What these considerations bring out is the close connection that exists between arguments for rule ordering and assumptions about the nature of the rules involved. In some cases, such as Subject Raising and Passive, standard formulations are such that no ordering is required to yield the correct results. In others, such as Pronominalization and various movement rules, alternative possible formulations are available such that on one account of how the rules work ordering is required and on another not. This raises the general question of the status of rule ordering as a descriptive or explanatory device in a linguistic theory, and the question whether it is possible or desirable to get rid of it altogether. Until a year or so ago, rule ordering was part of the orthodoxy of all versions of transformational grammar and of generative phonology. But following some work by Koutsoudas[2] there has recently appeared a body of literature calling the whole device very seriously into question.[3] Given the state of the subject it is not possible for anyone to demonstrate that rule ordering can be completely dispensed with. To do so would require the construction or something approaching an adequate grammar, a goal which is far from being realistic at present. But many arguments for rule ordering have been shown quite decisively to be invalid and some definite results have emerged. I want first to look at these results, then to make some remarks about the merits of rule ordering as a theoretical device, and finally to examine arguments for cyclic ordering and in particular for the distinction between cyclic and post cyclic rules. I will be arguing against a certain conception of the cycle and against the cyclic/postcyclic distinction. My discussion will deal entirely with grammar, not with phonology.

***   ***   ***

Arguments for rule ordering relate to the two-fold aim of generative theory of accounting for all and only well-formed sentences and assigning to them the correct constituent structure. The clearest case of an argument relying on claims about the assignment of constituent structure is the argument by which Ross tries to show that Extraposition is postcyclic. I will discuss that argument later. Most other arguments concern only the production of the right sentences, not the assignment of constituent structure. These

arguments fall into two classes - those attempting to show that a certain ordering of rules is necessary (and presumably sufficient) to ensure the generation of some well formed sentence, and those attempting to show that ordering is necessary and sufficient to block the production of some ill-formed sentence.

Claims to the effect that something is necessary to achieve a certain end are notoriously difficult to establish with any certainty because this involves showing that nothing else whatever would do the job. Such claims therefore have to be taken as being relative to a certain assumed theoretical framework. But even within the scope of this assumption it is easy to show that arguments for specific rule orderings which claim that the ordering is necessary in order to ensure the derivation of some well-formed sentence are invalid. This is one thing that has emerged quite clearly from recent work. The reason is simply that a system of unordered rules will always be at least as powerful as a system of the same rules strictly or partially ordered. This can be simply illustrated by considering an argument which aims to show that Passive must be ordered before Extraposition in order to allow sentences such as (13) to be derived from corresponding base trees such as (14)

(13)   It is believed by Fred that Tom will resign.

(14)
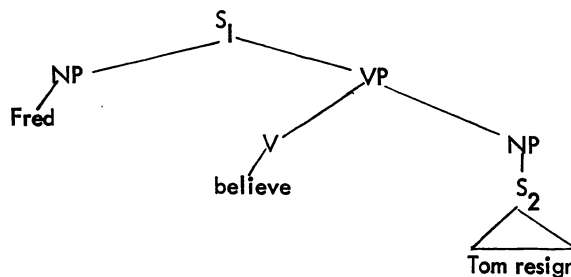
The standard form of the argument is this : if Extraposition were ordered before Passive it would be tested for application on the S_1 cycle before Passive had had a chance to apply and hence would not be available after Passive had applied. Hence, though (15) could be derived, (13) could not.

(15)   That Tom will resign is believed by Fred.

So the order must be : Passive before Extraposition. But this conclusion follows only if it is assumed that the two rules must be strictly ordered within any given cycle. Nothing else would make Extraposition unavailable after Passive if it had been tested for application before Passive. If the rules are taken to be unordered, so that they can be tested for

application in any order and apply whenever their structural description is met, there is no difficulty whatever in deriving both (13) and (15) from (14). So nothing having to do with this particular case justifies the assumption of strict ordering, and there are no general grounds in linguistic theory for assuming it. In fact, most theories assume that some rules are unordered, so assumptions about strict ordering in particular cases would have to be justified by reference to the cases in question. In this case, there is no such justification.
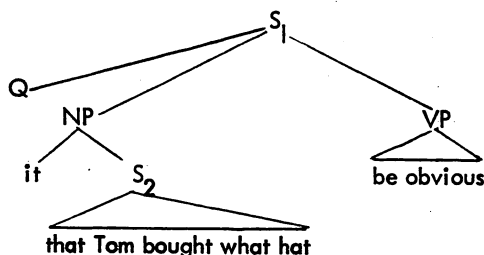
The general form of this sort of rule ordering argument is this : in order to derive grammatical sentence, X, it is necessary that two rules, A and B, apply in the order AB, not BA; therefore the rules must be extrinsically ordered to apply in the order AB. The conclusion does not follow from the premiss, because if A and B are unordered they will be able to apply in either order, given only that their structural descriptions are met, and hence, a fortiori, they will be able to apply in the order AB. Of course it may be possible to show that if A and B applied in the order BA some ungrammatical sentence would be generated. But that would be to fall back on a different sort of argument. As far as the present sort of argument is concerned, the claim is that if two rules must apply in a certain order to generate some grammatical sentence they must be extrinsically ordered so that they can apply only in that order; and this is what is invalid.

Since unordered systems are in general more powerful than corresponding ordered systems, there is likely to be more hope for rule ordering arguments based on the need to block the derivation of ungrammatical sentences than on the need to generate grammatical ones. So let us now consider arguments of this sort. In this case, unlike the previous one, it is not possible to show directly that rule ordering is unnecessary. However, it is possible, at least in certain cases, to show that rule ordering is not sufficient to block the ungrammat - ical sentence, and this leads, in conjunction with a certain principle having to do with the optional/obligatory distinction, to the conclusion that the ordering is not necessary. To illustrate this, consider a simple example discussed by Koutsoudas. (The example comes from Burt : From Deep to Surface Structure, an excellent source book for invalid arguments).

The argument purports to show that Extraposition must be ordered to precede WH-Q-Movement, otherwise it would not be possible to block the derivation of (16) from (17).

(16) * What hat is that Tom bought obvious?

(17)

```
                              S₁
        Q                   /    \
          \  NP           /        VP
           \ /  \       /         /\
           it    S₂              be obvious
               /_____\
      that Tom bought what hat
```

If WH-Q-Movement applied to (17) it would move <u>what hat</u> out of S₂ into the position of Q, and since Extraposition is optional there would then be no way of blocking (16). However, if Extraposition applies first and moves S₂ to the end of S₁, WH-Q-Movement can then apply and yield the grammatical (18)

(18)   What hat is it obvious that Tom bought.

But this argument assumes that if Extraposition is <u>ordered</u> before WH-Q-Movement it will always <u>be applied</u> before that rule, an assumption which is not justified unless Extraposition is made <u>obligatory</u>.   So extrinsic ordering of Extraposition before WH-Q-Movement is not alone sufficient to block (16).   For it to be sufficient, <u>Extraposition must be made obligatory</u>, and in that case rule ordering will not be necessary since the <u>obligatoriness</u> of Extraposition will ensure that the <u>that</u>-clause is shifted to the end of the sentence. Of course to say that in this case Extraposition is obligatory is not to give a   complete explanation of what is wrong with (16), since Extraposition is not in general obligatory.   But nor is it a purely <u>ad hoc</u> step, because it seems that complements have to be thrown to the end in all questions, as the sentences of (19) show.

(19)   (a)   Did it surprise John that Fred resigned?

            (b)   *Did that Fred resigned surprise John?

            (c)   Would it embarrass Fred for him to meet Alice?

            (d)   *Would for him to meet Alice embarrass Fred?

So it is at least a partial explanation. And in any case, it makes the proposed rule ordering redundant.

Actually, in the case of trees like (17) there is another fairly well established principle which has the consequence that WH-Q-Movement cannot apply until the complement has been Extraposed.   According to Ross's Sementential Subject Constraint no material can be

moved out of a sentence which is the subject of another sentence. If this is right, it follows that in (17) <u>what hat</u> cannot be moved out of S_2 until S_2 is moved out of subject position in S_1, and the only movement rule applicable is Extraposition. This alone is enough to rule out (16) without either imposing extrinsic ordering or making Extraposition obligatory.

An important principle which has come to light in recent discussions of rule ordering concerns the precedence of obligatory rules over optional rules.[4] Suppose there are two rules, A and B, which apply to the same input trees, and that A is optional and B obligatory. Suppose further that the operation of the optional rule A on the input tree would have the effect of transforming that tree in such a way as to make the obligatory rule B inapplicable. Then in that case it follows that the obligatory rule B must apply first, otherwise we would have the contradictory situation of a rule being prevented from applying to a tree to which it must apply. The only case in which an optional rule applicable to the same tree as an obligatory rule can apply before the obligatory rule is that in which the operation of the optional rule leaves the three intact as an input to the obligatory rule. Where the operation of the optional rule would modify the tree in such a way as to make the obligatory rule no longer applicable, the obligatory rule must take precedence.

This principle of the precedence of obligatory rules over optional rules makes redundant those arguments for rule ordering which aim to show that of a pair of rules applying to the same structure, one of which is optional and the other obligatory, the obligatory one must be ordered before the optional one. A typical argument of this type is one used by Lakoff and criticized by Ringen concerning the order of Reflexivization and Imperative Formation. Lakoff argues that Reflexivization must be ordered before Imperative Formation to prevent the ungrammatical (20) being derived from (21).

(20) * wash you

(21)
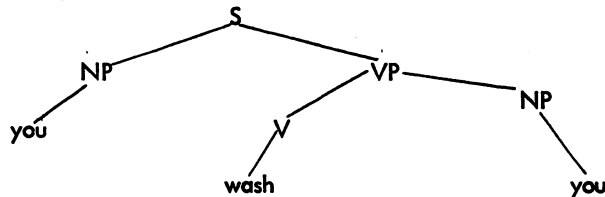
If Reflexivization applies first the result is (22) from which (23) derives by Imperative Formation.

(22) You wash yourself

(23) Wash yourself

93

But if Imperative Formation applied first (20) would be derived from (21), and then Reflexivization would not be able to yield (23), since it requires a structure with identical subject and object. However, the crucial feature of this case as Ringen points out, is not that the derivations of the ungrammatical (20) would result from a certain possible order of rule application, but that it would result from the non-application of the obligatory rule of Reflexivization - i.e. from a contradiction. In short, the requirement that the grammar be consistent is sufficient to rule out (20); extrinsic ordering is unnecessary. This of course throws the weight of explanation back on the question why Reflexivization is obligatory and what in general is the justification for making some rules obligatory. But that is a question I don't want to go into here. The point here is just that all forms of transformational grammar take some rules to be obligatory and, given this, considerations of consistency will demand, in cases like the one just considered, that obligatory rules apply before optional ones, and this makes the imposition of extrinsic ordering unnecessary in such cases.

Following Ringen, I have taken the principle of precedence of obligatory over optional rules as implying that the obligatory rule must apply before the optional one thereby rendering extrinsic ordering redundant. But in a grammar which contains global derivational constraints, allowing transformational rules in effect to look back (or forward) order a whole derivation so that they are not restricted to the information contained in the input tree, this principle need not be stated in terms of rule ordering at all. In the present case, if the rule of Reflexivization can take account of information available at an earlier stage of a derivation - in particular the presence of the subject in (21) - it could still apply after Imperative Formation had deleted the subject. On this conception of a grammar, to say that a rule is obligatory would not be to say that it must apply at the point when the appropriate structure comes up in a derivation, but that it must apply at some stage before the derivation is completed if the triggering structure turns up at any point in the derivation. I mention this not because I want to argue for it here, but just to point out that there is some doubt whether even intrinsic ordering - at least of the sort required by considerations of consistency - is necessary in a grammar.

There are then two main points which emerge from recent discussions of rule ordering. First, there are no valid arguments for rule ordering that are based on the claim that without ordering certain grammatical sentences could not be generated. Secondly, there are in principle sound arguments for rule ordering based on the claim that without ordering certain ungrammatical sentences could not be blocked; however in many cases the ordering is

unnecessary since the correct results follow from some other principle such as the principle of precedence of obligatory over optional rules. It is, therefore, a reasonable heuristic mazim, where rule ordering appears necessary, to look for some other principle which is sufficient to yield the correct results. In any case, as I now want to argue, rule ordering in itself has little explanatory value, and must be seen at best as a way of stating something for which an explanation is required.

Extrinsic ordering is a kind of global derivational constraint since it makes the applicability of a rule at a given point of a derivation dependant not only on the structure of the tree at that point but on what has happened at earlier points in the derivation. Thus, if rule A is ordered before B, then after a point in a derivation (or a cycle of a derivation) where B has applied A cannot apply even though a tree having the appropriate structure for its application comes up. What blocks A is something that has happened at another stage of the derivation, namely the application of B. So a grammar with extrinsic ordering, like a grammar with other global derivational constraints, must contain a device for making available at every stage of a derivation the previous history of the derivation.

This is not in itself a disadvantage since there is plenty of evidence that some global derivational constraints are required in a grammar. Chomsky has argued against such derivational constraints (though, oddly, he allows extrinsic ordering) on the grounds that they increase the power and reduce the empirical content of linguistic theory. The argument is that a theory which allows global derivational constraints places fewer restrictions on the form of possible grammars than one which does not. This is, of course, true, but it is not clear that it has any force when set against proposals about actual grammars. The actual global constraints proposed - such as Postal's crossover constraint or Lakoff's constraint regarding surface order of quantifiers relative to underlying command relations - are formulated in terms of universally applicable concepts such as coreference, command and linear order and make universal and empirically testable claims about language and the form of grammars. As such they increase enormously the empirical content of actual proposals for grammars, and considerations about what possible grammars would be compatible with a theory allowing global derivational constraints are substantially irrelevant. So global derivational constraints are a thoroughly respectable theoretical device. However, this doesn't lend any support to extrinsic rule ordering as a device in a grammar, since rule ordering is an inferior kind of derivational constraint involving claims of a language-specific sort and placing no restrictions on the general form of a grammar.

95

In principle, it would be possible to make universal claims of a rule ordering variety; for example, to classify rules into types - movement, chopping, unbounded, and so on - and to look for universal ordering constraints relating different types of rules. But, in fact, specific ordering constraints, though they work for particular languages, rarely have any plausibility as universal, or even relatively general, constraints. Even the claim that the cycle is a universal principle of grammar doesn't normally carry with it the claim that a rule which is cyclic in one language will be cyclic in any other language which contains that rule. In fact, it is quite common to find rule ordering used as a device by which languages may be distinguished and contrasted.   Two languages may be said to be similar in respect of certain rules they have in common but to differ in that they apply the rules in a different order.   For example, Pieter Seuren has pointed out to me a difference between English, on the one hand, and French and German, on the other, in respect of number agreement in cleft sentences, as in (24)

(24)　　　(a)　It $\left\{ x \begin{matrix} is \\ are \end{matrix} \right\}$ Fred and Tom who ....

　　　　　(b)　Es $\left\{ x \begin{matrix} sind \\ ist \end{matrix} \right\}$ Fred und Tom die ....

　　　　　(c)　$\left\{ x \begin{matrix} Ce\ sont \\ C'est \end{matrix} \right\}$ Fred et Tom qui ....

and has suggested that the difference be accounted for by different ordering of the number agreement rule and the rule which shifts the conjoint NP out of initial position.   There is obviously nothing universalizable about rule ordering considered in this language-specific way.

Is there any explanatory value in extrinsic rule ordering?   In the case just considered there is very little, but in fact this may not be an objection.   To characterize the difference between (24) a , on the one hand and (24) b and c on the other, as a difference in rule ordering is, in effect, to say that the difference is a very trivial and superficial one having no connection with anything else in the grammar;   and this may well be the truth about this case.   It would be rash to assume that every observable linguistic characteristic requires a deep explanation.   There may well be some which are superficial and accidental   and such that that they could have been different without affecting any other part of the grammar.   If there are such data, extrinsic rule ordering would be one appropriate account of them.   For it is a feature of extrinsic rule ordering that there is no in-built reason why the ordering couldn't have been different.   (In such cases, one would expect variation over time and across a speech community.   So it is an empirical question

whether there is extrinsic rule ordering). However, this can't be used as a general justification of rule ordering since it is certain that not all of the data that rule ordering has been invoked to account for are accidental or superficial. In cases which are not superficial, rule ordering alone cannot be an adequate explanation since the mere ordering of A before B does not in any way explain why the order couldn't have been the reverse; and if there is some principle which has as a consequence that A must apply before B, and therefore <u>has</u> some explanatory value, there is no need to <u>order</u> A before B.

I mentioned earlier in discussing Pronominalization and movement rules that arguments to the effect that rule ordering is necessary to block a wrong derivation are relative to particular accounts of the nature of the rules involved. For example, direction of movement is crucial in the cases I discussed. This suggests that where rule ordering is shown to be necessary, this is because the processes involved have not been properly understood and the rules in consequence not properly formulated. At least this is a reasonable heuristic maxim to adopt. A good case in point is the treatment of complementation in English. Rosenbaum's classical treatment could be made to work only if the rules were extrinsically ordered. For example, in the part of the derivation of (25) set out along Rosenbaum lines at (26), if the obligatory rule of <u>It</u>-replacement applies to line (a) instead of to line (b) there is no way of getting Extraposition to shift the remnants of the complement to the end, since Extraposition, on Rosenbaum's account, requires <u>It</u> to be present.

(25)   John is believed by Tom to have convinced Fred.

(26)   (a) $\lceil$it $\lceil$for John to have convinced Fred$\rfloor$
                           be believed by Tom $\rfloor$

        (b) $\lceil$it be believed by Tom $\lceil$ for John to have
            be   convinced Fred $\rfloor\rfloor$

        (c)   John be believed by Tom $\lceil$ for $\lceil$ to have
                            convinced Fred $\rfloor$ $\rfloor$

Now it has been shown on grounds having nothing to do with rule ordering[5] that Rosenbaum's <u>It</u>-replacement rule is wrongly formulated and that in various other respects his account of complementation is deficient; and it turns out that if complementation is treated in a way which utilizes the rule of Subject Raising the need for rule ordering such as that just mentioned disappears. Here then is a concrete case where a better understanding of the processes involved eliminates the need for rule ordering, and this lends support to the claim I have been making that, with the possible exception of genuinely accidental data, the validity of rule ordering arguments should be taken as evidence that the relevant processes have not been

properly understood. (Actually in the case of complementation the usual post-Rosenbaum accounts still involve some rule ordering - e.g. ordering Extraposition as post-cyclic. Later I will sketch an account which requires no rule ordering).

The claim that the need for rule ordering is evidence of an inadequate account of the rules, and the consequent claim that absence of a need for rule ordering is evidence of a better account of the rules, need to be treated cautiously. These claims are significant only in cases, such as the one must discussed, where the account of the nature of the rules is arrived at independently of the aim of eliminating extrinsic rule ordering. It is always possible trivially to replace an extrinsic ordering constraint by an intrinsic one, simply by building ad hoc conditions into the relevant rules. For example, I considered earlier an argument designed to show that Extraposition must be extrinsically ordered before Pronominalization. Supposing the argument to be basically sound, there is an obvious way of attempting to avoid its conclusion : simply place a condition on Extraposition blocking its application in cases where the input tree contains pronouns. This would prevent it from applying after Pronominalization and secure the desired result without extrinsic ordering. However, this would represent no real gain since the condition is just as ad hoc and lacking in explanatory power as the extrinsic ordering it replaces. In fact, it is just a notational variant of extrinsic ordering. A genuine gain is made only when the reformulation of the rules that removes the need for extrinsic ordering is based on considerations having nothing to do with rule ordering. Only in that case is the removal of the need for rule ordering evidence that a better understanding of the processes involved has been achieved.

*** *** ***

I now want to turn to the cycle. There are four distinguishable aspects of usual accounts of the cycle.

(1) S nodes play a crucial role in specifying the domain of application of a rule. For example, Reflexivization and Passive apply to nodes immediately dominated by the same S. Equi-NP-deletion, Subject Raising and Neg-raising, on the other hand, apply only to trees in which one S is embedded in another, and so on. This is an important and universal point about the form of transformational rules in general, but it does not mark off cyclic rules from others.

(2) Cyclic rules apply in a block, first to the most deeply embedded S, then to the next S up the tree and so on. This is the central aspect of the cyclic principle.

(3) Cyclic rules apply in strict order within any given cycle. This is not crucial to the cyclic principle, and I won't discuss it since what I have already said bears directly on it.

(4) Not all rules are cyclic: there are most-cyclic rules, and there may be pre-cyclic and last-cyclic rules.

As the terminology suggests, non-cyclic rules are distinguished according to the order which they are claimed to apply relative to the cycle. The distinction between last-cyclic and post-cyclic rules turns on ordering. Last cyclic rules are rules interspersed with cyclic rules on the last cycle - i.e. the top S of the tree. Post-cyclic rules also apply only to the top S, taking in the whole tree, but they do not apply until after all the cyclic rules have applied.
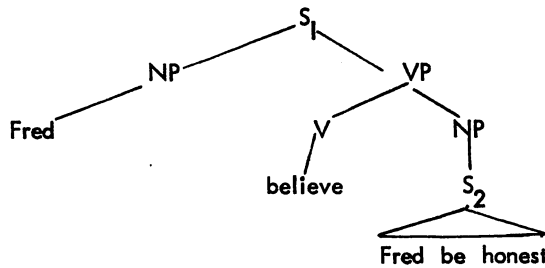
The cyclic/post cyclic distinction is standardly an extrinsic ordering device based on arguments of the same general sort as those considered earlier. I want to suggest, as with ordering generally, that if there is a distinction it is a consequence of the processes involved and not a matter of extrinsic ordering. But first some remarks about the cycle. As far as I am aware there is no general argument for making cyclic ordering a property of grammars. The situation is rather that a number of arguments have been advanced to show with respect to some set, usually a pair, of rules that they must be cyclically ordered, and from this it has been concluded that the cycle must be a universal of grammar. Let us leave aside the claim to universality and concentrate on the particular cases. It turns out that all of the usual kinds of arguments for cyclic ordering are in fact invalid.

A typical argument is one used by Jacobs and Rosenbaum[6] concerning the ordering of Reflexivization and It-replacement. Nothing turns on their wrongly formulated It-replacement rule, so we can restate the argument with reference to Reflexivization and Subject-Raising. The relevant sentences are those of (27).
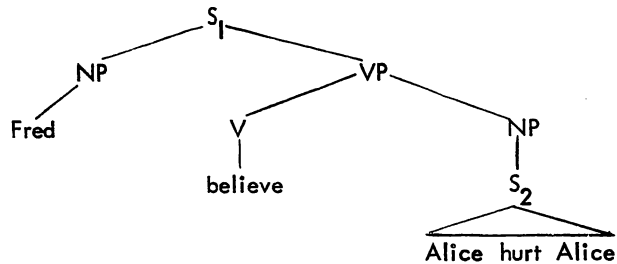
(27) (a) Fred believes himself to be honest
(b) Fred believes Alice to have hurt herself

The respective base structures are those of (28)

(28)　(a)

Fred believe Fred be honest (S₁ → NP "Fred", VP → V "believe", NP → S₂ "Fred be honest")

(b)

Fred believe Alice hurt Alice (S₁ → NP "Fred", VP → V "believe", NP → S₂ "Alice hurt Alice")

The argument proceeds as follows. Suppose Reflexivization precedes Subject Raising. Then (27) (a) will not be derivable since Reflexivization will not be applicable until Subject Raising has made the two underlying subjects into clause-mates. So Subject-Raising must precede Reflexivization. However, given this order, (27) (b) is not derivable because if Subject Raising shifts the subject of S_2 into the main clause there will no longer be identical clause-mates to trigger Reflexivization. So, it is said, we have an ordering paradox or a contradiction : Subject Raising must both precede and follow Reflexivization. But there is nothing contradictory about that; it is perfectly compatible with the rules being unordered. All that the argument shows is that the two rules cannot be strictly ordered in a linear fashion, from which it follows that they are _either_ unordered _or_ ordered in some non-linear, for example, cyclic, fashion. It does not follow that they _must_ be cyclically ordered. The argument is invalid because it overlooks the possibility of the rules being unordered. Extra evidence would be needed to justify the cyclic conclusion; and in this particular case it is quite clear that the hypothesis that the rules are unordered correctly accounts for the facts. Reflexivization is obligatory, so either must apply directly to (28) (b) before Subject Raising or there must be a derivational constraint that carries forward the clause-mate information and ensures that Reflexivization will take place before the derivation is completed. In the case of (28) (a) the only relevant rule that can apply is Subject Raising. If it does apply

Reflexivization will then be triggered; if not Pronominalization will apply to yield (29). So assuming

(29)   John believes (that) he is honest

the rules to be correctly formulated, the imposition of cyclic ordering is redundant. The ordering is intrinsic and turns on the fact that Reflexivization and Subject Raising have different domains of application.

Not all arguments for the cycle are as bad as the one just considered. Ross's famous argument for cyclic ordering of Pronominalization is considerably better; but even it is invalid and fails to establish its conclusion. Whereas the Jacobs and Rosenbaum argument claimed that cyclic ordering was necessary to ensure the derivation of certain grammatical sentences, and is therefore of a type which is always invalid. Ross's argument claimed that cyclic ordering was necessary (and sufficient) to block certain bad derivations. It is therefore a more promising type of argument. The key observations are the sentences in (30) where subscripts mark coreference.

(30) (a)   Realizing that he$_i$ had cancer bothered John$_i$
     (b)   *Realizing that John$_i$ had cancer bothered him$_i$
     (c)   Mary's realizing that he$_i$ had cancer bothered John$_i$
     (d)   Mary's realizing that John$_i$ had cancer bothered him$_i$.

The argument is that the facts of (30) can be readily accounted for if it is assumed that Pronominalization is cyclic, obligatory, and subject to the usual constraint that, while it operates freely in a rightwards direction, it can go leftwards only if it goes down into a subordinate clause. Pronominalization operates obligatorily and rightwards on the first cycle in the tree underlying (a), so that (a) results from the operation of Equi on the second cycle and (b) is blocked. (30) (b) could arise only as a result of Equi on the second cycle after Pronominalization had either failed to apply or had applied leftwards on the first cycle, neither of which is possible. However, (c) and (d) are derivable because Pronominalization is inapplicable on the first cycle and able to operate in either direction on the second.

There are two points to be made about this elegant argument. First, even if it shows that the assumption that Pronominalization is cyclic correctly accounts for the sentences of (30), it doesn't show either that this assumption will work in other relevant cases or that in this case some other account won't work equally well. Secondly, a crucial feature of Ross's proposal about Pronominalization is that it must be obligatory. This is necessary in order to

prevent (30) from arising as a result of Equi applying on the top S after Pronominalization had failed to apply on the S whose verb is realize. But if Pronominalization is obligatory, there is no need to order it cyclically. All that is required is a correct statement of the conditions under which it is applicable. Since these conditions are met in the S whose verb is realize, if Pronominalization is obligatory it must apply on that S. This is a consequence of the requirement that the grammar be consistent; cyclic rule ordering is not necessary. Cyclic ordering alone is not sufficient to block (30) ; it is required also that Pronominalization be obligatory, and in that case ordering is unnecessary.

An argument for cyclic ordering which is fallacious in a similar way to Ross's argument occurs in McCawley's 'English as a VSO Language'[7]. McCawley considers the two sentences of (31).
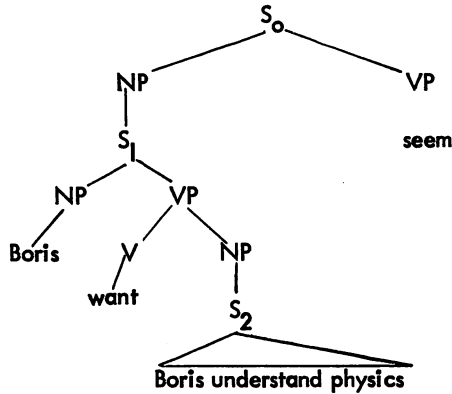
(31)   a   Boris wants to seem to understand physics

         b   Boris seems to want to understand physics

and points out that, to get (31)a. from the base tree (32)a. Equi must apply to S_o after Subject Raising has applied to S_1, whereas to get (31)b from the base tree (32)b, Equi must apply to S_1 before Subject Raising applies to S_o.

(32)   a
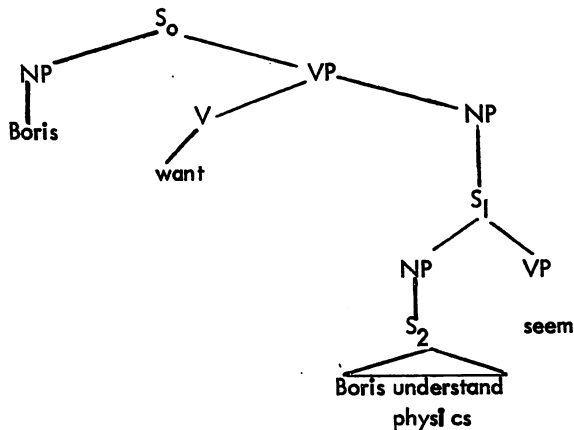
b.

These observations are correct, but they show only that Equi and Subject Raising cannot be ordered linearly, not that they must be cyclically ordered. In (32)a Equi cannot apply on S_o until Subject Raising on S_l has created the conditions for its application. So in that case the ordering is intrinsic. In (32)b, if Subject Raising applied on S_o before Equi on S_l, the conditions for the application of Equi would be destroyed and there would then be no way (assuming there are no derivational constraints to carry forward the relevant information) of deleting the subject of S_2. So Equi must apply on S_l before Subject Raising on S_o. However, cyclic ordering alone is not sufficient to achieve this. If Equi were cyclically ordered and optional, it need not be applied on S_l, in which case there would be no subsequent way of deleting the subject of S_2. So Equi must be obligatory. But in that case its application on S_l will be guaranteed without any ordering. So its cyclic ordering is unnecessary.

I now want to consider the claim that there are postcyclic rules – that is, rules which must be ordered to apply right at the end of a derivation. The rules most commonly claimed to be post-cyclic are Extraposition, Topicalization, WH-Q-Movement, WH-Rel-Movement, Pronominalization (following difficulties raised for Ross's treatment) and Number Agreement.

Extraposition plays a key role since it is often argued both to be postcyclic and to precede the other rules, from which it would follow that they are also post-cyclic. However, there are some arguments independent of Extraposition, and I will look at a typical one of those first.

There are two aspects to the claim that there are postcyclic rules. The first is the claim, presupposing the existence of the cycle, that there are rules which can apply only after the cycle has been completed. The second is the claim that there are rules whose domain of

103

application is the top S - the S of maximum scope - and which therefore cannot apply on embedded Ss. The two claims are independent. The first does not entail the second, since a rule might in principle be ordered after the end of the cycle and yet apply only on one of the embedded Ss. The second does not entail the first, since a rule whose domain of application is the top S may well be cyclic, in which case it would be last-cyclic. Arguments aiming to show that a rule is post-cyclic presumably aim to establish both claims. The arguments I know of seem to be not to succeed.

A typical argument is the dangling preposition argument designed to prove that WH-Movement rules - both Q and Rel - are post-cyclic. The argument can be illustrated for questions by reference to the sentences of (33). Similar sentences are available for relatives.

(33) (a) Who(m) does John think that Fred said that Tom promised to give the book to?

(b) To whom does John think that Fred said that Tom promised to give the book?

(c) *Who does John think to that Fred said that Tom promised the book?

As is shown by (33) (a) and (b), movement of a WH-word out of an indirect object position to the front of a sentence may optionally be accompanied by the preposition. However, as is shown by (33) (c), if the preposition is moved, it must be moved right to the front of the sentence with the WH-word, and cannot be deposited at the front of any of the embedded sentences. Now if WH-movement were cyclic, it would first move the WH-word to the front of the most deeply embedded S, then to the front of the next on the next cycle, and so on; and since the movement of the preposition is optional there would be nothing to stop it being moved with the WH-word to the front of an embedded sentence and left there, while the WH-word moved further up the tree on the next cycle. So, it is argued, WH-movement can't be a cyclic rule.

Now this is not a bad argument. But it doesn't establish that WH-movement can't be cyclic. What it shows is that the domain of application of WH-Q-Movement is the S which immediately dominates the WH-word in surface structure. Thus in a structure like (34)

104

(34)

S_1

S_2

S_3

WH
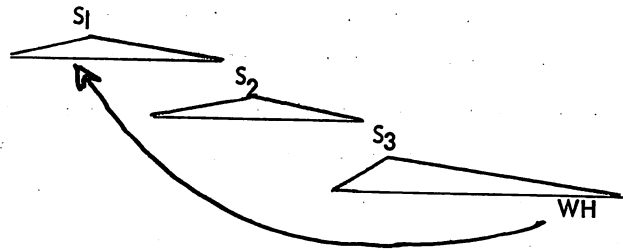
where the WH-word originates in S_3 and ends at the left of S_1, the domain of its application is S_1. That is, in cyclic terms WH-movement in (34) applies to the S_1 cycle but not on the S_2 or S_3 cycles. Now there is in standard forms of transformational grammar an independently motivated device which guarantees that WH-movement has just this domain of application. In <u>Aspects</u> type grammars, base structures for questions have a Q-node occupying the leftmost position in the appropriate S, and it is this which triggers WH-movement. In (34), Q would be in S_1 but not S_2 or S_3, thereby ensuring that WH-movement would apply only on the S_1 cycle. In later work, the rather more interesting suggestion has been made by C.L. Baker[8], on the basis of fairly convincing evidence, that the Q should be replaced by some sort of binder - perhaps the WH itself - would have the same effect as the Q of correctly fixing the domain of application of WH-movement, except that on this treatment there would be no movement of a WH-word, only movement or deletion of a variable. Baker has also pointed out, what is easily accounted for on his treatment, that the domain of the WH-question formation rule is not necessarily the <u>top S</u>. In a sentence such as (35)

(35)   I wonder who John gave the book to.

the domain is the sentence which is the object of the main verb, and this is guaranteed by the occurrence of the binding and triggering device in that position in the base structure. As (36) shows, the WH-word can't be moved to the front of the main clause.

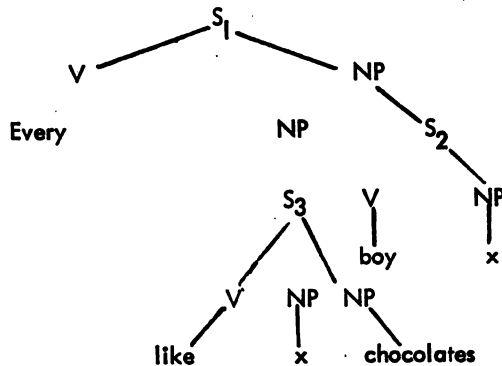(36)   * Who do I wonder (that) John gave the book to?

A grammar which treated WH-movement as postcyclic would have difficulty in accounting for this.

The dangling preposition argument, then, does not prove that WH-movement is post-cyclic. But, now does the criticism of the argument which I outlined show that the rule is cyclic in the sense of having to be blocked from applying until after all the more deeply embedded sentences have been processed. To establish that, some further argument would be required. But in fact it seems that nothing absurd follows from supposing the rule to be

unordered, as long as its domain of application is correctly stated. Similar remarks apply to WH- Rel-Movement, since it also depends on the presence of a triggering device relatively high in the tree, in this case the head NP in the relevant complex NP.

It is noteworthy that, with the exception of Extraposition, the other rules which have been claimed to be postcyclic, all involve a triggering device without which they cannot apply and which is relatively high in the tree. At least this is so on the most plausible account of transformational grammar according to which base trees contain variables bound by quantifiers or external NPs in higher Ss. Much discussion of rule ordering is still carried on within an outmoded model of what base trees look like and how the rules work. This is especially pointless in the case or arguments about rule ordering because, as I pointed out earlier, such arguments depend crucially on assumptions about the nature of the rules involved. In particular, if we take seriously the proposal that base trees contain variables which are bound from a higher S, some of the arguments aiming to establish that certain rules are post-cyclic, or at least non-cyclic, collapse. For if a rule involves variables and binders its domain of application will not be a deeply embedded S but either the top S or a relatively high S. For example, given a structure such as (37)[9]

(37)

$$
\begin{array}{c}
S_1 \\
V \qquad NP \\
Every \qquad NP \quad S_2 \\
S_3 \quad V \quad NP \\
V \quad NP \quad NP \quad boy \quad x \\
like \quad x \quad chocolates
\end{array}
$$

the domain of Number Agreement will have to be S_1 since that alone contains the relevant predicate _every_. There is nothing in S_2 or S_3 to determine number, and it is only on S_1 that a distinction such as that between (38) (a) and (38) (b) is marked.

(38) (a) Every boy likes chocolates

(b) All boys like chocolates

This doesn't show that Number Agreement is not post-cyclic, but it does show that it is a 'late', or rather a 'high' rule, in the sense that its domain is a high S; and this is enough to undermine certain sorts of arguments designed to show that it must be extrinsically ordered as

106

post- (or last-) cyclic.

Similar remarks apply to Topicalization and the rule which accounts for the distribution of pronouns in surface structure. If pronouns derive from underlying variables, which variables turn up as surface structure pronouns will not be determinable on any deeply embedded S, but only on the S which contains the quantifier or external NP which binds the variables - i.e. on a relatively high, often the top S. In case of Topicalization of non-sentential NPs, it is always possible to have a pronoun in surface structure coreferential with the topicalized NP, and in some cases this is obligatory, as is shown in (39).

(39) (a) John, Fred doesn't like (him).

(b) The Prime Minister, Fred doesn't know who he is.

(c) xThe Prime Minister, Fred doesn't know who is.

These facts are most naturally accounted for if Topicalization is treated as a rule having the same domain of application as the rule which lowers external NPs into places originally occupied by variables. If Topicalization is applied an underlying variable shows up as a surface pronoun or in some cases gets deleted. If not, the external NP is lowered into the place of the variable. This treatment has the consequence that Topicalization is a 'high' rule, in the sense that its domain of application is the S immediately dominating the relevant external NP, for example, S_1 in (40).

(40)

not   x likes y
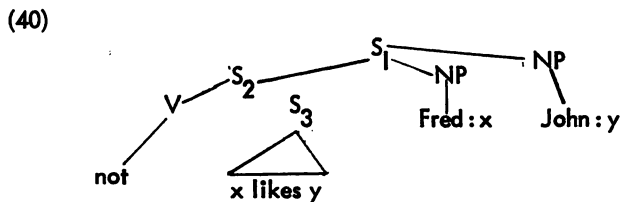
This account is supported by the fact that topicalization of sentential NPs does not permit the occurrence of a pronoun corresponding to the topicalized NP, as is shown in (41).

(41) (a) That Nixon is honest, few people believe

(b) xThat Nixon is honest, few people believe it.

This is a direct consequence of the fact that sentential NPs are not external NPs binding variables in base structures.[10]

None of what I have just been saying <u>proves</u> that there are no post-cyclic rules in the sense of rules which must be ordered to apply right at the end of a derivation, but it does undermine part of the case for post-cyclic rules by showing that independently motivated

accounts of the nature of the relevant rules have the consequence that those rules can't apply on deeply embedded Ss.   There is still, however, the case of Extraposition which is not amenable to the same treatment as Topicalization, Number Agreement WH–Movement and Pronominalization.   I want to argue that either there is no such rule or, if there is, it does not apply in cases which would justify the claim that it is post-cyclic.

Extraposition is the rule which moves sentential NPs to the end of the sentence in which they occur.   The argument for making it post-cyclic is due to Ross, and turns on surface structure constituency.   In a sentence such as (42)

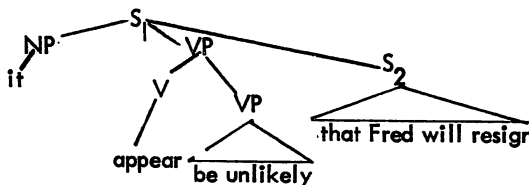(42)   It appears to be unlikely that Fred will resign

there is a major intonation break after <u>unlikely</u> but not after <u>appears</u>.
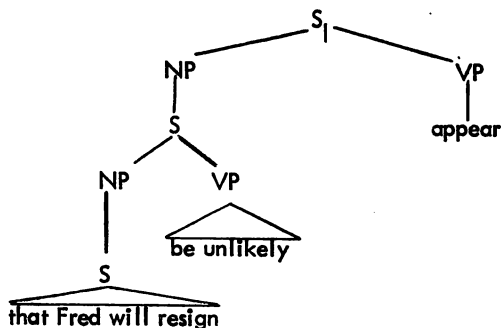Hence the surface structure must be (44), not (43)

(43)
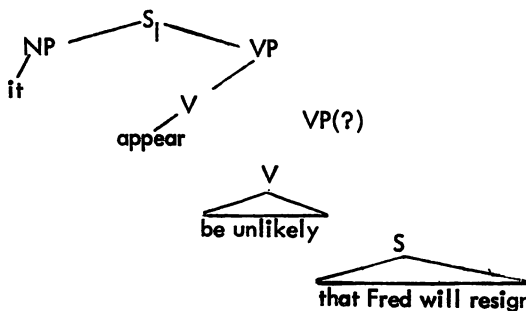
(44)

If Extraposition applied cyclically to the base structure (45)

(45)

108

the result would be (43) with be unlikely combined with the sentential NP, but if it applied postcyclically the result would be (44) with the two higher verbs adjoined under a common node. So it is post-cyclic.

A feature of this argument is that it assumes that surface syntactic structure may be determined by considerations of sound pattern. Given this assumption, which I will assume to be a reasonable one, the argument is valid. So if Extraposition is a rule applicable in the derivation of sentences such as (42), it is post-cyclic; and, in view of an argument mentioned earlier, Pronominalization, or whatever rule replaces it in a grammar with bound variables, must also be post-cyclic.

One aspect of Extraposition that should cause some suspicion is that it has to be made optional in some cases and obligatory in others without there being any clear principle to account for the difference. Thus with verbs such as believe, expect, appear, likely, and so on, it is optional, but with seem, appear and a few others it is obligatory as is shown in (45)

(45)   (a)   It seems that Fred will resign
        (b)   *That Fred will resign seems

As pointed out earlier, it also has to be obligatory in questions. Now it is clear that there has to be some rule which moves sentential NPs. What I want to propose is that, if underlying VSO order is assumed, then at least in many cases, the relevant rule is the independently motivated rule of Subject Formation which moves NPs, including sentential NPs leftwards. Troublesome data such as (46) and questions still have to be accounted for, but on the treatment I suggest, the account would be in terms of conditions which block Subject Formation from moving a sentential NP into subject position; and this is a theoretically more desirable account than one which says that there is a rule of Extraposition which is usually optional but sometimes obligatory.

Given a VSO underlying order, a rule is needed to provide English declaratives with a subject left of the verb. It has sometimes been proposed that if Tense is a higher verb the ordinary rule of Subject Raising is sufficient to create surface subjects. Thus, given an underlying structure such as (47)

(47)
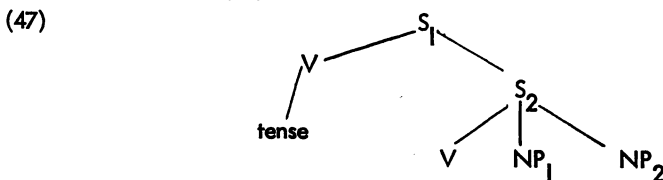
Subject Raising lifts NP_1 out of S_2 into the top clause where it remains as surface subject after Tense is lowered and attached to the verb in S_2. There are three objections to this account. First, there are some embedded Ss which are tenseless and which nevertheless require a surface subject (e.g. 'For Fred to resign would be impossible'). Secondly, Subject Raising standardly has the effect of turning the sentence whose subject has been raised into a to plus infinitive constituent, whereas verbs of a main clause have to be finite. Thirdly, Subject Raising can apply only when there is a vacant NP position in the higher S for the raised subject to occupy. For example, as is shown by (48)

(48)   John believes of Fred   that he is sick

believe can be a three place verb and hence can accommodate a raised subject as in (49) without creating an ill-formed tree.

(49)   John believes Fred to be sick

But regret cannot be a three place verb as is shown by the ungrammaticaity of (50) and consequently of (51)

(50)   x John regrets of Fred that he is sick
(51)   x John regrets Fred to be sick

Now it is not entirely clear what sort of verb Tense is, but it is certain that it is not a two place verb. Consequently, if the subject were raised in (47) an incoherent structure would result. So I will assume with Georgia Green[11] that a separate rule of Subject Formation is required which has the effect of removing the first NP after the V in a VSO structure and Chomsky-adjoining it to the S from which it was removed, thereby transforming a VSO tree into a NP-VP one, as shown at (52)
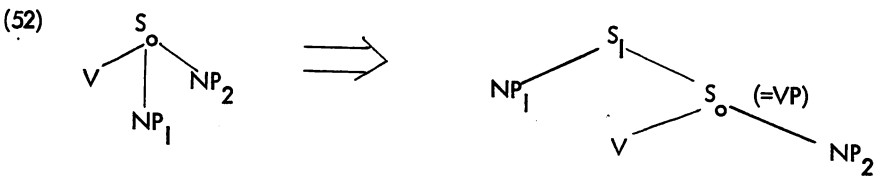

Given VSO underlying order, one-place verbs such as seem will have the embedded S after the verb.   Hence, if there is a rule of Extraposition it will not be applicable until Subject Formation has lifted the embedded S into subject position; and this suggests that Extraposition, if there is such a rule, should be formulated in such a way that its structural description is met only after Subject Formation has given the relevant sentence a subject. This would guarantee that it applies 'late' on a cycle, though it would not make it post-

cyclic, since Subject Formation can apply to embedded Ss as well as to the top S. However, such a revision of the rule is sufficient to undermine Ross's argument. For in (42) be unlikely is the infinitive part of a to plus infinitive constituent, which suggests that it has not been provided with a subject - that is, Subject Formation has not applied on the relevant S, and in consequence Extraposition is blocked from applying on that S. So the desired constituent structure, (44), results even if Extraposition is cyclic. If Subject Formation and Extraposition apply on the cycle with be unlikely as the verb the result is not (42) but (53)

(53) It appears that it is unlikely that Fred will resign

and in this case there is a constituent break after appears. So, given VSO underlying order, if there is a rule of Extraposition, the argument that it must be post-cyclic fails. This is sufficient to cast doubt on the thesis that there is need for the cyclic/post-cyclic distinction in a grammar. Moreover, if there is underlying VSO order and a rule of Subject Formation, there is in fact no need for a rule of Extraposition at all, at least as far as sentences with one-place verbs such as in (42) are concerned since the embedded S is already in final position in underlying structure. And given a certain plausible account of the Passive rule, sentences with verbs such as believe can also readily be handled without Extra-position.

The rule of Subject Formation forms a subject out of the first NP after the V by Chomsky-adjoining it to the S from which it is removed. In the particular case of sentential NPs, Subject Formation in English can either form a subject out of the sentential NP or insert the dummy subject it which also turns up in certain sentences not containing an embedded S, such as 'It is raining.' I take it that the base tree for sentences like 'It is raining' is as in (54)
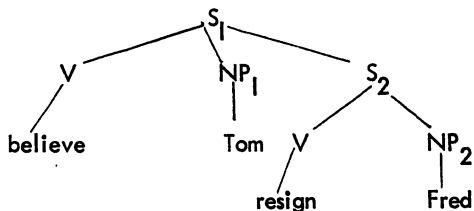
(54)
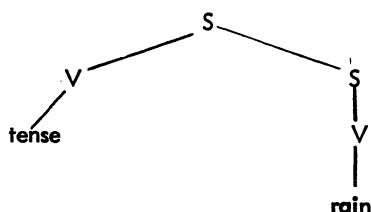
Since there is no NP, the only possible subject is the dummy It. Now, in the case of sentences such as those of (55)

(55)   (a)   Tom believes that Fred will resign
        (b)   Tom believes Fred to be going to resign
        (c)   That Fred will resign is believed by Tom
        (d)   It is believed by Tom that Fred will resign
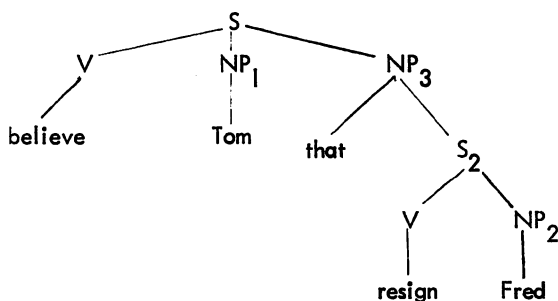   (e)   Fred is believed by Tom to be going to resign
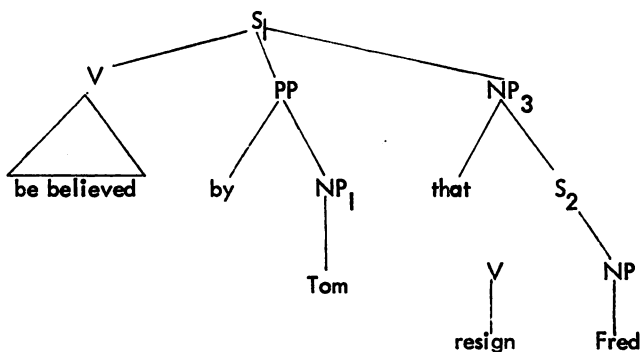
III

the base tree, ignoring Tense, is (56)

(56)

```
                      S₁
         V           NP₁        S₂
      believe        Tom     V       NP₂
                          resign    Fred
```

If Subject Raising applies to S_2, and Subject Formation to S_1, Chomsky-adjoining NP_1 to S_1, Chomsky-adjoining NP_1 to S_1, the result is (55) (b).   If, however, <u>that</u> is inserted above S_2 as in (57)

(57)

```
                   S
      V          NP₁          NP₃
   believe       Tom     that      S₂
                                 V     NP₂
                              resign  Fred
```

Subject Raising on S_2 is blocked and the only rule applicable to S_2 is Subject Formation.
Subject Formation on both S_2 and S_1 results in (55) (a).   Now (57) meets the structural
description for Passive-V followed by two NPs immediately dominated by the one S.   Suppose
Passive is not a movement rule but has the effect of deriving (58) from (57).

(58)

```
                       S₁
      V              PP                NP₃
  be believed     by    NP₁        that      S₂
                        Tom              V        NP
                                      resign     Fred
```

Then, because NP_1 is now under a PP, it can't be made into a subject. Subject Formation, then, can either Chomsky-adjoin NP_3 to S_1, in which case we have (55) (c), or it can insert the dummy subject It, in which case we have (55) (d). If that is not inserted and Subject Raising is applied to (56), Passive can then apply on S_1, since the two NPs Tom and Fred, will follow the verb, and in that case Subject Formation on S_1, will make Fred the subject, in which case (55)(e) results, since NP Tom will be part of a PP.

As far as I can tell, all the rules I have mentioned in connexion with the sentences of (55) can be unordered without undesirable consequences. The only novel assumption is that Passive is not a movement rule. This assumption is compatible with all the facts of English, but is not crucially testable against, for example, Ross's constraints because its domain of application is confined to a single clause. However, the general treatment of complement-ation that I have outlined would be testable in languages with surface VSO order where there is no Subject Formation rule of the sort that occurs in English. As far as I have been able to tell from a preliminary examination of relevant data in Samoan, there is rather encouraging support for the sort of account I have outlined.

There are, of course, residual problems. First, there is the problem, which arises on any account, of explaining why that-clauses can occur as subject of some one-place predicates such as be unlikely but not others such as seem. On the treatment I have outlined, this problem takes the form of explaining why in certain cases, movement of that-clauses is blocked, whereas on the orthodox account it arises as the problem of explaining why Extra-position is sometimes obligatory. Secondly, there is the problem of accounting for sentences with emotive verbs such as surprise, amuse etc. It has sometimes been argued that these involve a rule of Flip or Psych-Movement, and that the that-clauses originate in final position. In that case, there is no problem since Flip, like Passive, would be reformulated as a non-movement rule. But it now seems likely that there is no Flip rule at all and that the that-clauses with emotive verbs originate as part of a factive construction in the position immediately after a higher verb cause. Even so, it may still be possible to do without Extraposition. But in any case, if it is necessary to have a rule of Extraposition for cases of this sort, that won't affect the general thesis that there is no need for a cyclic-postcyclic distinction. For the argument turning on surface structure constituency does not apply in the case of emotive verbs, but only with one-place verbs.

To summarize, I have argued for the following points. First, arguments which maintain that rule ordering is necessary in order to make possible the derivation of certain

grammatical sentences are always invalid. Secondly, arguments claiming that rule ordering is necessary to block some wrong derivation giving rise to an ungrammatical sentence, or a wrong pairing of a sentence and a base structure, or a wrong assignment of constituent structure, may be sound. However, at least in the cases considered, supposed extrinsic ordering is not necessary since the correct results are guaranteed by some universal principle such as the requirement that the grammar be consistent. And where there is no such principle to secure the correct results, it is a good heuristic maxim to take a demonstration that rule ordering is necessary as a sign that the rules have not been adequately understood. Finally, I raised objections to arguments about the cycle and the alleged distinction between cyclic and post-cyclic rules, and outlined an unordered system of rules which works satisfactorily for at least a limited class of complement constructions.

FOOTNOTES

1. For example, in Lakoff: 'Pronouns and Reference', Indiana Linguistics Club. Mimeo.

2. A. Koutsoudas: 'The Strict Order Fallacy', Language 1972

3. See papers from the Indiana Conference on Rule Ordering, 1973, Indiana Linguistics Club Mimeo.

4. C. Ringen: 'On Arguments for Rule Ordering'
   Foundations of Language 8: 266-273

5. Cf. Kiparsky & Kiparsky: 'Fact', in Bierwisch & Heidolph (eds.):
   Progress in Linguistics, Mouton, 1970.

6. Jacob and Rosenbaum: 'English Transformational Grammar' Ch. 28., Blaisdell, 1968.

7. Language, 46

8. C.L. Baker: 'On the Description of English Questions', Foundations of Language, 1970.

9. For discussion of base trees of this sort, see McCawley 'A Program for Logic' in Davidson and Harman (eds.): Semantics of Natural Language, Reidel, 1972.

10. Note also that Topicalization of non-sentential NPs can, in some cases, occur in embedded Ss shifting the NP either to the front of the embedded S, or to the front of the top S. Thus, "John says that egg creams, he likes', 'Egg creams, John says he likes.' It is hard to see how a post-cyclic treatment of Topicalization could account for this in as natural a way as the account I propose.

11. See Papers from the Eighth Regional Meeting of the Chicago Linguistic Society, 1972, pp. 96-97.