2. (p.131) The reference is to an attempt to devise and motivate a node-pruning principle which would remove some of the many counterexamples to Perlmutter's Surface Subject Constraint. The attempt (which was in the suppressed portion of chapter 4) was not an unqualified success, and it is probably not possible to assume that English has any such general constraint as the Surface Subject Constraint.

CHAPTER TWO

The Universal Ordering Hypothesis

2.0 In this chapter, I will re-examine the universal ordering hypothesis proposed in § 1.2, and show that a more thorough investigation of scrambling and its interaction with gapping forces a reformulation of this hypothesis. It will be argued that the rule of Extraposition which places constituents in post-verbal position in Turkish is distinct from other rules which permute constituents in preverbal position. It will be shown that this Extraposition rule must precede the rule of Deletion in Turkish, and further evidence will be considered to show that this ordering is universal. A formal distinction will be drawn between this Extraposition rule and the extraposition rules found in SVO languages like English and Russian, and it will be argued that the Turkish Extraposition rule is formally related to a rule of Focus-Assignment in English. It will then be argued that Scrambling rules (as distinct from such Extraposition rules) must universally follow not only the rule of Extraposition but also (in SVO languages) the rule of Focus-Assignment.

Thus the universal ordering hypothesis will be altered in detail, but its universality will be maintained. It will be seen that the reformulation of the ordering hypothesis affects only one of the arguments presented to account for the distribution of gapping patterns, namely that concerning the non-existence of any AC languages; a more general
explanation of this particular fact will be proposed in chapter three.

2.1 Scrambling and Gapping

2.1.0 In this section I will show that the universal ordering of rules assumed under hypothesis (1.2.31) cannot be maintained for Turkish on empirical grounds. I will propose that a distinction be drawn between Extrposition, which postposes constituents in Turkish, and Topicalization, which preposes constituents. I will then discuss the ordering relation between these rules and the rules Deletion and $\text{Rev}_R$, and propose a reformulation of the universal ordering hypothesis.

2.1.1 In the earlier discussion, it was observed that the order of application of transformations under Ross's hypothesis was always:

Forward Gapping (Deletion)

Scrambling

Backward Gapping ($\text{Rev}_R$)

and there it was assumed that this ordering of rules was in fact correct. I will now reconsider this assumption.

That $\text{Rev}_R$ follows Scrambling is incontestable, since in languages with Scrambling, such as Russian, $\text{Rev}_R$ is possible with any constituent which gets into final position as a result of Scrambling. Thus $\text{Rev}_R$ applies to both verbs and objects in such languages. What is to be considered here is the ordering of the Deletion rule with respect to Scrambling and $\text{Rev}_R$.

In Turkish, the usual object-gapping pattern is SOV SV:

(1) Ahmet patlicanı pişirdi, Mehmet yedi.
Ahmet the eggplant cooked Mehmet ate

"Ahmet cooked the eggplant (and) Mehmet ate (it)."

which is exactly what we would expect, given basic SOV order. However, as mentioned above, in § 1.2.3, there are two other gapping patterns for objects:

(2) SV SVO: Ahmet pişirdi, Mehmet yedi, patlicanı.
Ahmet cooked Mehmet ate the eggplant

(3) SVO SV: Ahmet pişirdi patlicanı, Mehmet yedi.
Ahmet cooked the eggplant Mehmet ate

i.e., the orders that would be expected if Turkish had a Scrambling rule, which it does: the verb and object may, under certain discourse conditions, be permuted.

So the gapping of objects in Turkish parallels the gapping of verbs in Russian: (3) is derived by Deletion followed by Scrambling, and (2) by $\text{Rev}_R$ after Scrambling.

It remains to explain why, if Turkish has such a Scrambling rule, we do not get for Turkish the third verb-gapping pattern:

(A) *(for Turkish) SVO SO

I.e., since you can get:

(4) Ahmet pişirdi patlicanı.
Ahmet cooked the eggplant
and

(5) Mehmet pişirdi yumurtayı.
    Mehmet cooked the egg

how can it be explained that *(6) is ungrammatical?

(6) *Ahmet pişirdi patlicanı, Mehmet yumurtayı.
    Ahmet cooked the eggplant Mehmet the egg

i.e., why can't the verb undergo Deletion followed by Scrambling in the left conjunct?

The ungrammaticality of *(6) appears to be an anomaly under the ordering assumption proposed in Chapter 1. If the ordering is as assumed, we would expect Deletion to produce

(7) Ahmet patlicanı pişirdi, Mehmet yumurtayı.
    Ahmet the eggplant cooked Mehmet the egg

and Scrambling in the left conjunct to yield *(6).

If, on the other hand, the ordering of the two rules concerned is the reverse of that assumed, we would expect Scrambling in both conjuncts to yield

(8) *Ahmet pişirdi patlicanı, Mehmet pişirdi yumurtayı.
    Ahmet cooked the eggplant Mehmet cooked the egg

and Deletion to yield *(6). Thus either order of application of the rules Scrambling and Deletion should yield *(6), but *(6) is ungrammatical.

But note that *(3) is also ungrammatical. It appears that in Turkish, Scrambling has to be constrained in certain ways in its operation

up in the next section; here it suffices to note that Scrambling or at least verb-object Inversion, must be blocked in conjoined sentences with identical verbs and non-identical objects (presumably the restriction is of a more general nature, but this is the only aspect of it that concerns us at present).

Note that if Deletion precedes Scrambling, as assumed, the constraint on Scrambling will have to be formulated so as to make reference to gapped structures.

For otherwise there is no way to prevent Scrambling from applying to the left conjunct in (7), which is grammatical, to get *(6), which is not.

In short, under the assumed ordering hypothesis, it requires two constraints on Scrambling to prevent both *(6) and *(8). It is conceivable, of course, that a single more general constraint might be formulated that includes these two constraints; however, I don't see how this is possible without making reference either to the fact that Deletion had occurred, or to the former presence of an identical verb. Neither of these conditions is formulate within the present theory, and there seems to be no compelling reason to contemplate them here.

In view of the immediately preceding discussion, it might be asked whether certain aspects of the interrelation between the two rules might not be more easily accounted for if the ordering were

Scrambling
Deletion

E.g., if the conjunction *(8) has to be characterized as ungrammatical,
and if Scrambling follows Deletion, is it not suspect that Scrambling
has to be blocked in the first conjunct of (7) after Deletion in pre-
cisely the same sentences? If Scrambling precedes Deletion the ungram-
matical conjunction will never be formed and Deletion will not even ap-
ply to it.

There is other evidence that Scrambling should precede Deletion.
For there are conjoined structures which are scrambled, but cannot
be gapped:

(9) Ahmet sever babasını, Mehmet annesini sever.
Ahmet loves his father Mehmet his mother loves
"Ahmet loves his father and Mehmet loves his mother."

which cannot be gapped to produce:

(10) *Ahmet sever babasını, Mehmet annesini.
"Ahmet loves his father (and) Mehmet his mother."

If Scrambling precedes Deletion, the conjunction (9) is well-formed
because it violates no constraint on Scrambling; and (10) is ungram-
matical because the Deletion rule will not see the two verbs as like ele-
ments (they are in different places in the structure). It was shown
in § 1.1 that the Deletion rule has to be formulated in any case so that
it deletes the second of two items only when they are in identical gram-
matical relations with the rest of the sentence. (It should be remem-
bered that the structural identity requirement proposed in § 1.1 raises
important theoretical issues, for if Deletion is to be stated as a ge-
neral rule (with certain general and perhaps language-particular restric-
tions) there must be available some way of characterizing the notion
"identical structure" without actually specifying what the structure
is. This will require that the entry condition be a more powerful
device than that required for most transformations. It is clear, how-
ever, that every proposed particular transformation designed to account
for the facts of CD contains exactly this restriction.)

Thus the ordering of Scrambling before Deletion would require no
extra mechanism to account for these sentences, whereas if the ordering
is the reverse, a constraint must be put on Scrambling, preventing the
scrambling of the left conjunct after gapping of the verb out of the right.

If Scrambling follows Deletion, in fact, it is clear that the
Scrambling rule must be constrained in several ways to prevent the
generation of ungrammatical gapped structures which under the reverse
ordering would automatically be prevented either by more general con-
straints on Scrambling in conjoined sentences or by the inapplicability
of Deletion to the structures resulting from Scrambling.

For example, one aspect of Scrambling in Turkish is subject-Extra-
position, which corresponds precisely to the object-Extrposition that
produces SOV → SVO; subject-Extrposition optionally places the subject
in post-verbal position under certain conditions which can be charac-
terized roughly as extreme de-emphasis. However, subject-Extrposition
may not occur in either member of an object-gapped conjunct pair:

(11) Ahmet yumurtayı pişirdi, Mehmet yedi.
Ahmet the eggplant cooked Mehmet ate
"Ahmet cooked the eggplant (and) Mehmet ate (it)."
(12) *Ahmet yumurtayı pişirdi, yedi Mehmet.
(13) Ahmet pişirdi, Mehmet yedi, yumurtayı.
(14) *Pişirdi Ahmet, Mehmet yedi, yumurtayı.

This corresponds to a similar constraint on subject-extrapolation in conjoined sentences that are not gapped:

(15) *Ahmet yumurtayı pişirdi, patlıcanı yedi Mehmet.
(16) *Yumurtayı pişirdi Ahmet, Mehmet patlıcanı yedi.

Again, if Scrambling follows Deletion a double constraint has to be put on Scrambling to block *(12) and *(14) independently of *(15) and *(16); but with the opposite ordering only *(15) and *(16) need be blocked from Scrambling.

There is a similar constraint on like-object-extrapolation in one of two conjoined sentences:

(17) *Ahmet pişirdi yumurtayı, Mehmet yumurtayı yedi.
   *"Ahmet COOKED the egg and Mehmet ate the EGG."

and this also corresponds to a constraint on gapped sentences, because forward gapping of the object in an unscrambled sentence like

(18) Ahmet yumurtayı pişirdi, Mehmet yumurtayı yedi.

yields

(19) Ahmet yumurtayı pişirdi, Mehmet yedi.

with secondary accent (which can be considered automatically placed, according to straightforward phonological rules) on the final verb. But then if the first conjunct is subsequently scrambled:

(20) *Ahmet pişirdi yumurtayı, Mehmet yedi.

the result is ungrammatical, because in such a conjunction, primary accent is required on both verbs.

Thus again it appears that independent scrambling in one conjunct of a gapped conjunction either leads to ungrammaticality or forces an extra constraint to be placed on Scrambling. Whereas if Scrambling precedes Deletion, and Deletion is formulated so as to require identity of structure in the two conjuncts, *(20) will automatically be blocked, and the correct output (21) will automatically be generated:

(21) Ahmet pişirdi yumurtayı, Mehmet yedi.

It was tacitly assumed in earlier discussion that (20) was to be generated by Scrambling after Deletion; but now it becomes clear that such an assumption is untenable, unless the rule which effects scrambling in the left conjunct can be made, in just the right cases, to place primary accent on the verb in the right conjunct.

In the light of these considerations, it seems that a re-evaluation is indicated to see how crucial was the assumption that Deletion precedes Scrambling. Restricting attention for the moment to Turkish, a review of the discussion in §1.2.4 will reveal that these two transformations appear in only one derivation: namely the derivation of the object-gapping pattern: SVO SV. There it was assumed that this pattern results from Deletion followed by Scrambling. However, this is the case
discussed immediately above, where it is shown that the correct pattern is not derivable with that ordering, without a complication of the Scrambling rule. Fortunately, there is another way to get this pattern: since in Turkish, deletion of final elements is not prohibited, this pattern could result from deletion of the final object from a conjunction of the form: SVO SVO, if Scrambling is ordered before Deletion. We have seen that this rule ordering is not only possible, but is in fact forced. And since no other derivation seems to require a different ordering, we can assume that for Turkish, this ordering of transformations is correct since it not only produces the correct gapping patterns, but also allows the proper generalization about deletability from scrambled conjuncts to be made.

Examination of other languages for evidence of crucial ordering between Scrambling and Deletion yields the same result: every derivation in which it was assumed that Scrambling follows Deletion can be replaced by one in which Scrambling precedes Deletion; whether in languages such as Russian and Latin significant generalizations are missed with the assumption of the former ordering that can be automatically captured by assuming the latter ordering, I have not yet been able to determine.

The only other argument affected by reversing the assumed ordering of Scrambling and Deletion is the explanation of the distribution of gapping patterns in various languages. There the assumption of Scrambling after Deletion was crucial to the explanation of why no language has the gapping patterns (A) and (C) and not (B) as well. Let us leave this argument suspended for the moment; I will later (in Chapter 3) propose a different explanation of this fact, based on a different sort of consideration.

I hereby propose that assumption (1.2.31) be modified so that Scrambling is assumed to precede Deletion.

2.1.2 Note that the scrambling which has been considered in this discussion is limited to inversion of object and verb. Scrambling in languages like Russian, Latin, and Turkish, however, is generally considered to include also other inversions, and in particular, inversion of subject and object:

(21) yumurtayı, Ahmet yedi.
the egg Ahmet ate

And this S/O inversion can occur independently in the two sides of gapped structures:

(22) Ahmet yumurtayı yedi, patlicanı Mehmet.
Ahmet the egg ate the eggplant Mehmet

(23) yumurtayı Ahmet yedi, Mehmet patlicanı.
the egg Ahmet ate Mehmet the eggplant

(22) is an expectable reply to (24):

(24) patlicanı, Ahmet mi yedi?
"Did Ahmet eat the eggplant?"

(23) is an expectable reply to (25):
(25) Mehmet, yumurtayı yedi.

"Mehmet ate the egg."

If Deletion requires complete structural identity (down to some level of analysis) in order to delete the second of two identical items, this is clearly evidence that S/O inversion follows Deletion, and occurs independently in the two conjuncts.

If, on the other hand, we wanted to have all cases of Scrambling precede Deletion, it is clear that Deletion would have to be formulated so as to be insensitive to the order of subject and object. Clearly the crucial information for Deletion is that the deleted item, in some sense, bear exactly the same grammatical relations in the right conjunct as in the left. But there is no clear way, without introducing an unnecessary complication in the entry condition for Deletion (namely something like a disjunction of structural descriptions with the different S/O orders) to make this information available to Deletion, since grammatical function is encoded in the IC structure.

The solution is to posit not one, but (at least) two Scrambling rules. One, which effects S/O inversion, and will be called Topicalization, occurs after Deletion (explaining why Deletion is insensitive to S/O inversion); and the other, which effects inversion of subject or object with the verb, will be called Extraposition, and occurs before Deletion.

2.1.3 We have seen that S/O inversion (Topicalization) has to be ordered after Deletion because subject-object inversion in Turkish operates independently in the conjoined sentences, even if the verb of the second has undergone Deletion. That this inversion must however occur before \( \text{RNR} \) has applied seems to be indicated by the following sentences:

(26) *yumurtayı Mehmet, patlıcanı Ahmet, pişirdi.
(27) *yumurtayı Mehmet, Ahmet patlıcanı pişirdi.

In (26), it can be seen that S/O inversion cannot occur in both conjuncts of \( \text{RNR} \) structures; and in (27) it can be seen that this inversion is also impossible if it takes place in only one conjunct. Apparently, the only way to account for this, without placing some constraint on the S/O inversion rule referring specifically to backward-gapped structures, is to order \( \text{RNR} \) after S/O inversion and require SOW order in the conjuncts; i.e. to make \( \text{RNR} \) sensitive to SO order.

Thus it seems that assumption (1.2.31) should be replaced by (26):

(26) the ordering of transformations is:

Extraposition (O/V Inversion)

Deletion

Topicalisation (S/O Inversion)

\( \text{RNR} \)

2.1.4 Before going on to consider whether (26) can be maintained as a universal constraint on the ordering of transformations, let us consider some further evidence that bears on the ordering of Deletion with respect to \( \text{RNR} \).
It has been argued above that subject-verb Agreement has to precede \( \text{RN} \). This was necessary to account for the agreement of raised verbs with the subject of the last clause. It has also been argued that conjoined subjects result from DR. If this argument is accepted, however, it follows that Deletion must precede Agreement; for the verb in a sentence with conjoined subjects (in English, and in languages generally) agrees not with the nearest subject, but with the conjunction of subjects. Rules for verb agreement with conjoined subjects vary in particular languages, but one general convention, which holds for English, is that if the subjects are conjoined by and or its equivalent, the verb is marked for agreement with a plural subject. (It happens that in Turkish the verb is so marked only if the conjoined subjects are human; but Agreement still has to follow Deletion.) Thus we have additional evidence that Deletion precedes \( \text{RN} \).

2.1.5 Let us now consider whether (28) can be maintained as a universal condition on the ordering of transformations. So far, we have considered cases of Topicalization only in Turkish.

In German, there is an object-preposing rule converting (29) to (30):

(29) Eberhard kochte das Fleisch.
    "Eberhard cooked the meat."
(30) Das Fleisch kochte Eberhard.

which, since it inverts subject and object, is an instance of Topicalization.

The fact that the object starts out behind the verb in German seems to be of no consequence.\(^1\) Object-preposing in German has the same thematizing effect and the same syntactic characteristics as subject-object Inversion in Turkish. Consequently I will claim that they are the same process, effected by a universal rule of Topicalization; which is a rule which moves a sentence element, subject to certain universal and perhaps language-particular constraints, to the front of the sentence. Extrapolation will likewise be considered a universal rule that, subject to certain universal and language-particular constraints, moves a sentence element to the end of the sentence. The concomitant relocation of the subject in German can be considered an automatic and language-particular side effect of this rule, (which follows automatically from the language-particular requirement on German that the finite verb be in second position in main clauses).

Note that we can get no information from German about the ordering of Topicalization with respect to \( \text{RN} \), since Topicalization with subject-verb Inversion leaves the verb in non-final position:

(31) *Das Fleisch Eberhard und die Kartoffeln kochte Hans.
    the meat Eberhard and the potatoes cooked Hans

(31) is ungrammatical because it is gapped backwards and \( \text{RN} \) cannot apply to the verbs unless they are at some point in final position, which they never are.\(^b\)
In conjoined sentences, Topicalization occurs independently in the two conjuncts:

(32) Das Fleisch kochte Eberhard, und Hans kochte die Kartoffeln.

(33) Eberhard kochte das Fleisch, und die Kartoffeln, Hans.

and in verb-gapped structures (only forward Gapping is possible, since the verb is never in final position), Thematization still occurs independently in both conjuncts:

\[
\begin{align*}
(34) & \{\text{Das Fleisch kochte Eberhard}\} \quad \text{und} \quad \{\text{Hans die Kartoffeln.}\} \\
& \{\text{Eberhard kochte das Fleisch}\} \quad \text{und} \quad \{\text{die Kartoffeln, Hans.}\}
\end{align*}
\]

(although "die Kartoffeln, Hans" is a bit queer, since the initial impulse is to read the leftmost NP as a subject; whatever restriction is placed on the gapped structure, however, is also independently necessary in the ungapped one.)

These examples show that in German, as in Turkish, Deletion must precede Topicalization.

In English, there is a similar late reordering rule: this is the rule of object-Preposing, which, since it inverts subject and object, by preposing the object, is an instance of Topicalization:

(35) The beans, Harry cooked, and the potatoes, Henry.

(36) The beans, Harry cooked, and Henry, the potatoes.

(37) *The beans, Harry, and the potatoes, Henry cooked.

Some may not find (35) and (36) very good, and many may prefer (35) to (37), but both (35) and (36) are definitely a lot better than (37).

(35) and (36) show that object-Preposing follows Deletion, because Deletion can apply to the untopicalized versions of these:

(38) Henry cooked the beans, and Harry the potatoes.

and subsequent object-Preposing in either conjunct yields (35) or (36); but if Topicalization in one conjunct occurs first, the structural identity condition cannot be met and Deletion cannot apply.

Thus the generalization that Deletion precedes Topicalization is borne out again.

But look at *(37). We tentatively concluded in § 2.1.3 that Topicalization, in Turkish at least, should be ordered to precede $\varepsilon_N^R$. *(37) shows, however, that Topicalization in English must follow $\varepsilon_N^R$, for otherwise *(37) must be generated; and (39), which is grammatical, cannot be:

(39) The beans, Harry cooked and Seymour ate.

because this, under the assumption that Topicalization precedes $\varepsilon_N^R$, could only result from Deletion after Topicalization, and Deletion has been shown to precede Topicalization.

Even if this had not been shown, it would be impossible to derive (39) by Deletion. For one thing, the conjunction

(40) *The beans, Harry cooked, and the beans, Seymour ate.

is not grammatical, so that if it is to exist at all as input to the Deletion rule, Deletion has to be made obligatory in just this case.
Furthermore, the reduction convention for Deletion as I have formulated it (and this formulation has been seen to be well-motivated) will refuse to convert the gapped structure resulting from Deletion into a reduced structure, which is clearly necessary:

(41)

\[ S \rightarrow \begin{array}{c} \text{NP} \\ \text{KP} \end{array} \quad \begin{array}{c} \text{VP} \\ \text{S} \end{array} \quad \begin{array}{c} \text{NP} \\ \text{V} \end{array} \quad \begin{array}{c} \text{S} \\ \text{VP} \end{array} \]

The beans Harry cooked
Seymour ate

The structure of (39) after Deletion, if Topicalization had already occurred in both conjuncts, would be that shown in (41). The Reduction convention does not apply, since the right-most conjunct sentence does not dominate a single constituent. Thus the derived structure of (39) would have to remain as in (41). But this is at variance with the observable juncture after the beans; and the segment Seymour ate, which is claimed by this derived constituent structure to be an independent clause, lacks an object for the transitive verb ate. It will be shown in Chapter 3 that whereas such a clause may lack a verb as a result of Deletion, no independent clause containing a transitive verb may be without an object. It will be seen later that a forced reformulation of (11), the restriction on Deletion, will also independently require this to be a reduced structure. Note that Ross's hypotheses also make the wrong prediction in this case: if Gapping is an anywhere rule, (37) cannot be prevented after object-proposing in both con-

2.1.6 It appears that (28), like (1.2.31), is in need of revision; for English Topicalization clearly follows RNR. One could, of course, give up the claim that English Topicalization and Turkish Topicalization are the same rule, or the claim that the rule ordering proposed in (28) is universal; and unless other evidence leads independently to some resolution of this apparent contradiction, that is exactly what will have to be done.

However, there is other evidence that bears on this question. Note that in embedded sentences, Topicalization cannot occur:

(42) Hasan, Mehmedin yumurtayı pişirmesini istiyor
Hasan wants Mehmet's the egg cooking wants
"Hasan wants Mehmet to cook the egg."

(43) *Hasan, yumurtayı Mehmedin pişirmesini istiyor.
I.e., Topicalization applies only to the topmost S; it is a root transformation.

This is in general true of Topicalization in any language I can think of:

(44) *Jerry says that eggplant, he likes.
(45) *The fact that eggplant, he likes amazed me.
(46) *Harry wants \{the floors Sally to wash.\}
Sally the floors to wash.
(47) *Weil Backöpfel er gern hatte, ass er zu viel.
because baked he liked ate he too much apples
Consider the structure of a sentence with backward verb-gapping, which according to my hypothesis is

\[ (48) \]

Suppose that Topicalization in Turkish is ordered after \( \text{RNR} \).

If the structure (48) is correct, and if Topicalization is a root transformation, it clearly cannot affect reordering of the subjects and objects embedded under \( S_1 \). Then we can replace (28) with (49):

\[ (49) \]

The ordering of transformations is

- Extraposition
- Deletion
- (Agreement)
- \( \text{RNR} \)
- Topicalization

Thus the assertion that Topicalization is a universal rule can be maintained, as well as the claim that there is a universal ordering relation among the transformations effecting rearrangement of constituents and those effecting reduction of redundancy. Furthermore, a messy constraint on \( \text{RNR} \) in Turkish, namely that it not work if Topicalization had occurred in either conjunct, is no longer necessary.

Note that the ordering of Topicalization after \( \text{RNR} \) is crucial, whether Topicalization is post-cyclic or last-cyclic; for until \( \text{RNR} \) applies, the two parts of the conjunction are still conjoined sentences, not embedded in any higher structure. \( \text{RNR} \) creates an embedded structure out of a conjoined one. The universal definition of "root" or "topmost" clause must clearly be formulated so that conjoined sentences, although represented as being dominated by a higher S-node, are topmost S's as far as such rules are concerned; i.e., a root transformation must not be prevented from applying to a conjoined S simply because the S is dominated by a higher S. Such rules as Topicalization obviously have "topmost" S's as their domain, where a "topmost" S is an S that is either not dominated by anything or is dominated by an S that dominates only other S's (i.e., a conjunction of S's), and itself is not dominated by anything. Note that this hypothesis accounts for the fact that Topicalization occurs in gapped structures, but not in \( \text{RNR} \) ones, in a much more universally motivated and therefore more highly valued fashion than the earlier hypothesis. Gapped S's are "topmost" in the sense just outlined, and thus Topicalization can apply in them. \( \text{RNR} \) structures have no Topicalization not because of an otherwise unmotivated ordering of rules, as was required in the earlier hypothesis, but because they fail to meet a universal requirement for the application of root transformations.

The fact that English \( \text{RNR} \) structures do have Topicalization is also accounted for, since in English, the object of a \( \text{RNR} \) sen-
(50) Harry cooked, and Seymour ate the beans.

is in the topmost S and is thus available for Topicalization.

Extraposition in Turkish is also a root transformation, as can be seen by observing that it never occurs in embedded sentences; but before making any further claims about the universal nature of Extraposition, it will be necessary to investigate the precise nature of this rule in particular languages. This will be the topic of the next section.

2.2 Extraposition and Focus

2.2.0 In this section I will argue that the ordering relation between Extraposition and Deletion proposed in the last chapter can be maintained as universal. I will first establish a formal characterization of the Turkish Extraposition rule, and show that it can be identified on formal grounds with the rule of Focus assignment in English. I will argue that the Extraposition rule is peculiar to SOV languages, and show that for such languages the proposed ordering must be universal.

2.2.1 In what follows I make use of certain presuppositions which may not be universally accepted. It will be necessary to consider the conditions under which Extraposition may occur: we have seen that there is a restriction on Extraposition in conjoined sentences in Turkish, which prevents Extraposition of unlike objects in both conjuncts

this queer-looking fact, it will be necessary to establish in more general terms exactly what conditions allow or prohibit Extraposition.

The restrictions, it will appear, can only be stated in terms of discourse conditions. Thus in order to characterize the domain of application of the Extraposition rule, it will be necessary to refer to the discourse environment of the sentence; in particular, it will be necessary to make use of the notion of presupposition, which will be defined in a very restricted sense.

Consider the following short discourses, which should be interpreted as isolated discourses or as initial segments of a larger discourse; there is no preceding discourse. The symbol [*] will be used to signify ill-formed discourse. I do not mean, by using a distinct symbol for discourse ill-formedness, to imply that there is any intrinsic difference between the ill-formedness of an ungrammatical sentence and the ungrammaticality of an ill-formed discourse. It may, of course, be possible to establish formal differences between them, and to relate these formal differences to empirical differences. I intend this notation to be neutral in this respect. The symbol [*] will be used to indicate that whereas every sentence in the discourse is grammatical, and consequently appears in some well-formed discourses, the particular discourse so marked is one in which it can not occur.

(1) Hasan bir yumurta yedi.
Hasan an egg ate
(2) [*] Hasan yedi bir yumurta.
Hasan ate an egg
(3) Hasan bir yumurta pişirdi. Yedi yumurtayı.
Hasan cooked an egg. Ate the eggs.
of standard linguistic theory will be required. Several different extensions are conceivable, and some have been proposed in recent years, principally in Lakoff (1959b, c), Chomsky (1970, 1960). These proposals will be discussed immediately below.

I will adopt the extension which I proposed in § 0.3. The domain of application of certain transformational rules will be allowed to cross sentence boundaries. This decision leads to the necessity for another addition to linguistic theory: it will be necessary to be able to specify, for a given rule, whether it is sentence-bounded or not. This necessity, of course, arises only in connection with rules which are formulated with variables; we can say that a new constraint on variables is required in linguistic theory.

It is possible, as noted in § 0.3, that some correlation may be found between sentence-boundedness of the variable in a rule and other formal properties of the rule itself. Such an investigation is beyond the scope of this thesis; some discussion of the properties of deletion rules which are not sentence-bounded will be found in Chapter 4.

Given this extension, it is possible to formulate a statement of the condition on Extrapolation in Turkish. Note that to account for (1), (2), (3), (5), and (6), we could provisionally state the condition as follows:

(10) An NP may be extrapolated if the preceding sentence contains an identical (and coreferent) NP.

But (4) shows that this condition is too simple, since it is met in
(4) and Extraposition cannot occur. In order to modify condition (10) so as to exclude (4), it is necessary to develop the notion of presupposition.

I use this term in a different sense from that in Lakoff (1969a); the term is used with a meaning similar to that used here in other recent literature (e.g., Chomsky 1968, 1970). In Lakoff (1969c), presupposition refers to practically all the cognitive knowledge of the speaker (and his estimation of the cognitive knowledge of the listener) of the subject under discussion. I use the term in a more restricted sense, which in distinction to Lakoff's cognitive presupposition can be termed discourse presupposition; but henceforth I will simply use the term presupposition in the latter sense, which is equivalent to the notion Given information introduced by Halliday (1967).

The formal reconstruction of this notion is not a simple task, and what I propose here will certainly require modification as further facts are considered. What I propose to attempt is a formulation of the conditions under which Extraposition in Turkish is possible; I will then argue that the resulting set of conditions serve to characterize precisely the notion of Given information as used by Halliday.

2.2.2 Consider the following discourses:

(2') a. [*] Hasan onu yedi. Hasan ate it
    b. [*] Hasan yedi onu. Hasan ate it

(3') a. Hasan bir yumurta pişirdi. Onu yedi. Hasan an egg cooked it (he) ate
    b. Hasan bir yumurta pişirdi. Yedi. (he) ate (it)

(4') a. [*] Hasan bir yumurtayla bir patlican pişirdi. Hasan an egg and an eggplant cooked
    (Sonra) onu yedi. (Then) it (he) ate.
    b. [*] Hasan bir yumurtayla bir patlican pişirdi.
    (Sonra) yedi. (Then) (he) ate (it)

(5') a. Hasanın babası iyi adam. Hasan onu seviyor. Hasan’s father good man Hasan loves
    b. Hasanın babası iyi adam. Hasan seviyor. (Hasan) loves (him)

(6') a. [*] Hasan onu seviyor. Hasan loves
    b. [*] Hasan seviyor. Hasan loves (him)

It appears there is a correlation between the possibility of Pronominalization, the possibility of Deletion and the possibility of Extraposition. It will be argued in Chapter 4 that all cases of NP-Deletion under identity over a variable must go through a pronominal stage (this has also been argued in Orečnik and Perlmutter (1972)), so that the correlation between NP-Deletion and Pronominalization can be accounted for. However, the correlation with Extraposition is unaccounted for,
unless the same conditions hold for Extraposition as for Pronominalization.

The discourse conditions on Pronominalization have never been stated with any degree of clarity. The only well-established restriction on Pronominalization is that it does not operate leftward except into subordinate clauses. Since Extraposition does not occur in subordinate clauses there is no comparison on this count. But there are other conditions on Pronominalization, which have not to my knowledge ever been discussed. Consider

(11) [*] Hasan cooked an egg and an eggplant. Then he ate it.

It is clear that there is nothing wrong with he in (11), but it is no good.

Thus although it seems necessary to formulate Pronominalization so that it applies across sentence boundaries, to pronominalize an NP when an identical and coreferent NP is present in preceding discourse (perhaps, as a first approximation, in the preceding sentence), it is clear that further conditions must be placed on the application of the rule to prevent (11).

Perhaps a reasonable condition would be that if the antecedent NP is in a coordinate structure with another NP which might also be a possible antecedent for the pronoun, Pronominalization is blocked. Such a condition, however, is suspiciously particular, and ought to follow from some more general condition.

Whatever the exact conditions are that allow Extraposition in Turkish, it is clear that the extraposed constituent must in some sense be recoverable from the discourse context. This is evident from the fact that deletion of the same constituent can occur in precisely the same environment.

I will not attempt a precise formulation of these conditions; I will say that a constituent is presupposed if, in the immediately preceding discourse context in which the sentence appears, there is an identical coreferent antecedent (actually, this condition should be weakened: if we say a more specific coreferent antecedent, we can account for stressless epithets like the bastard, cf. discussion below) and if no other constituent in the same position would satisfy the same condition. For example, in (12), egg meets the stated condition:

(12) Hasan cooked an egg and an eggplant. Then he ate the egg.

But the same condition would also be met by eggplant:

(13) Hasan cooked an egg and an eggplant. Then he ate the eggplant.

Consequently neither egg nor eggplant is presupposed.

There are admittedly severe formal problems with this characterization, as well as empirical problems. I suggest it as a tentative first step towards a reconstruction of the notion of Given information as used by Halliday, and of the intuitive notion of discourse presupposition.

There is, in particular, one extension of this characterization that is necessary to account for Turkish Extraposition in terms of presupposition. Note that in (7) and (8), first and second person pronouns have been extraposed, and this extraposition can occur without previous
discourse. For the present, let us say that first and second person pronouns are automatically "presupposed". Halliday notes that constituents which are "highly predictable" speech-situationally can function as given in discourse function. This includes not only first and second person pronouns but also other "closed-system" items which have a limited number of oppositions.

Given this extremely loose characterization of the notion of presupposition, it is possible to state the conditions on Extraposition in Turkish:

(14) A constituent may be extraposed if it is presupposed.

The critical assumption underlying this statement is that, although the characterization of presupposition sketched here is imprecise and inadequate, a reasonably precise characterization is possible, given enough investigation in this area. If this assumption is incorrect, then I am wrong in attempting to account for discourse phenomena in a rigorous framework.

2.2.3 Consider the following English discourses, where the lexical item on which major sentence accent falls is indicated by caps:

(1'') Hasan ate an EGG.
(2'') [*] Hasan ATE an egg.
(3'') Hasan cooked an EGG. He ATE the egg.
(4'') [*] Hasan cooked an egg and an EGGPLANT. He ATE the egg.
(5'') Hasan's father is a good MAN. Hasan LOVES his father.

(6'') [*] Hasan LOVES his father.
(7'') Hasan LOVES me.
(8'') Hasan LOVES you.
(9'') [*] Hasan LOVES him.

It appears that the notion of presupposition, however it is to be characterized, is also necessary to account for the facts of "sentence accent" in English.

Note that in sentences (1'')-(9''), it is exactly the constituents which (under similar conditions) can be extraposed in Turkish which can occur after "sentence accent" in English.

Facts like these have been discussed in Halliday (1967); Halliday suggests that the constituent on which the major sentence accent falls (there are certain complications which I ignore here: namely, there may be more than one "major accent" in a sentence; in the unmarked case, however, there is only one) be designated the focus of the sentence. Thus in (1'') an egg is the focus; in the second sentence of (3'') ate is the focus; and in the second sentence of (5'') loves is the focus. Halliday observes that in the unmarked case, i.e., when a sentence is initial in a discourse or when no special circumstances obtain, the final constituent of a sentence is the focus.

...the information unit, realized as the tone group, represents the speaker's organization of the discourse into message units; the information focus, realized as the location of the tonic, represents his organization of the components of each such unit that at least one such component, that which is focal, is presented as not being derivable from the preceding discourse. If the information focus is unmarked (focus on the final lexical item), the nonfocal components are unspecified with regard to presupposition.
so that the focal is merely cumulative in the message (hence the
native speaker's characterization of it as 'emphatic'). If the in-
formation focus is marked (focus elsewhere than on the final le-
torical item), the speaker is treating the non-focal components
as presupposed.

[Halliday (1967) p.8]

Halliday also distinguishes between Given and New "information",
where Given is equivalent to presupposed as characterized above; and ob-
erves that only Given information may occur in postfocal position,
i.e., following the Focus.

Thus, in Halliday's example,

(15) JOHN painted the fence yesterday.

it is "presupposed" that someone painted the fence yesterday, and it is
asserted that it was John who did the painting. Halliday is careful to
note that presupposed constituents (Given information, in his terms)
can also occur before the Focus, as in

(16) John PAINTED the fence yesterday.

where John may or may not be Given. Thus a constituent in prefocal
position may be either Given or New, but a constituent in post-focal
position may only be Given.

Chomsky (1968) discusses similar phenomena, and concludes

Rules of phonological interpretation assign an intonation contour
to surface structures. Certain phrases of the surface structure
may be marked, by grammatical processes of a poorly-understood sort,
as receiving expressive or contrastive stress, and these markings
also affect the operation of the rules of phonological interpre-
tation. If no such processes have applied, the rules assign the
normal intonation. In any event, phrases that contain the intona-
tion center may be interpreted as focus of utterance, the conditions
perhaps being somewhat different and more restrictive when the in-
tonation center involves expressive or contrastive stress, as noted.
Choice of focus determines the relation of the utterance to re-
sponses, to utterances to which it is a possible response, and to
other sentences in the discourse. The notions "focus", "presup-
position", and "shared presupposition" (even in cases where the
presupposition may not be expressible by a grammatical sentence)27
must be determinable from the semantic interpretation of sentences
if we are to be able to explain how discourse is constructed and,
genre, how language is used.

[Chomsky (1968) p.16]

Footnote 27 reads:

Note that we are using the term "presupposition" to cover a number
of notions that should be distinguished. Thus "it was JOHN who
was here" expresses the presupposition that someone was here in the
sense that truth of the presupposition is a prerequisite for the
utterance to have a truth value. On the other hand, when we replace
one of the foci of "John gave Bill the book" by a variable, it is
not at all clear that the resulting expression determines a pre-
supposition in the same sense, though it does characterize "what
the utterance asserts" and to which utterances it is a proper re-
sponse, when so understood.

[Chomsky (1968) p.47]

The phonological rule assigning "information center" is apparently
a discourse insensitive rule, which places the major sentence accent
arbitrarily on some constituent in the sentence. Chomsky then proposes
to determine "focus of utterance" (which is equivalent not to Halliday's
Focus but rather to his New information) in terms of this arbitrary
assignment.

The approach to discourse presupposed in Chomsky's proposal is es-
entially the same as that of Postal to Pronominalization (Postal 1969).
Postal asserts that the only syntactic pronominalization is sentence-
bounded and that pronouns whose "antecedents" are in a preceding sentence
are generated in the base. This means that if well-formed discourse is to be characterized at all, the syntactic Pronominalization rule must be supplemented by a set of discourse well-formedness rules constraining which sentences can follow other sentences in discourse. Such discourse rules clearly must refer to the base-inserted pronouns and relate them to their "antecedents" in the discourse.

I propose to treat pronominalization as a discourse phenomenon from the start. There seems to be no empirical difference between pronominalization across sentence boundaries and pronominalization within sentence boundaries, so that to account for them with different formal devices is missing a generalization.

If Chomsky's characterization of "focus of utterance" in terms of arbitrarily assigned phonological features of the sentence is to be used to account for discourse well-formedness, it is clear that some set of discourse well-formedness rules is required to state the constraints on which sentences may follow which other sentences in discourse, e.g., to characterize (3′′) as well-formed, and (4′′) as ill-formed.

Chomsky does not indicate what form such discourse rules would take. What I propose is that the rule which assigns "intonation center" or "sentence accent" (which I will hereafter refer to as Focus Assignment) be formulated, like the Turkish Extraposition rule, so that it is sensitive to conditions in previous discourse.\(^5\) I propose, in fact, that the rule be formulated approximately as follows:

(17) Focus Assignment

\[ X A Y \rightarrow X \ A \ Y \ \text{[+Focus]} \]

Condition: A is the rightmost unpresupposed constituent, in the sense outlined above.

It should be clear that an attempt to formulate discourse-sensitive rules like this and the Turkish Extraposition rule is a far more ambitious undertaking than simply to define Focus in terms of an arbitrary phonological rule, as Chomsky does, or to represent Focus as a choice available to the speaker, as Halliday does. These two treatments of the phenomenon of focus are essentially non-distinct; and both fall short of an explicit account of discourse well-formedness, although both Chomsky and Halliday provide extensive informal discussion of this problem.

The particular extension of the theory which I propose is not the only conceivable approach to the phenomenon of discourse. Lakoff (1969b,c) proposes that a Focus be chosen as a part of the underlying semantic representation of an individual sentence. Then a derivational constraint is to assure that the chosen constituent be given sentence accent on the surface. The semantic representation is also to contain a conjunction of "presuppositions"; however, as noted above, Lakoff uses this term in a much less restricted sense that that outlined above in connection with the Turkish Extraposition rule. Chomsky, in the footnote quoted above, recognizes that the term "presupposition" can be
taken to include many things, and that probably only some kinds of pre-
supposition are relevant to discourse considerations such as the posi-
tion of Focus. What I have attempted in the characterization of "pre-
supposition" suggested above is a more precise delimitation of the aspect
of that notion which is operative in such rules.

Part of the controversy between Chomsky and Lakoff is due to Lakoff's
use of the term presupposition to refer to a representation of some
cognitive knowledge of the speaker, whereas Chomsky uses the term in a
much more restricted sense. Chomsky defines the presupposition of a
sentence as that sentence obtained by replacing the Focus (his Focus,
equivalent to Halliday's New Information) by a variable; thus the pre-
supposition of (15) is the sentence

(18) Somebody painted the fence yesterday.

Lakoff, on the other hand, gives the following example to illus-
trate what he means by presupposition:

(19) Pedro regretted being Norwegian.

which, Lakoff says, presupposes that Pedro is Norwegian. This is clearly
an entirely different use of the term. Sentence (19) may have no pre-
supposition at all, in Chomsky's sense, since the whole sentence is marked
as potentially New by the sentence accenton the final constituent. It
may, on the other hand, have one of the presuppositions (20) or (21):

(20) Pedro regretted something.
(21) Pedro did something.

It is this terminological mismatch that underlies much of the con-
troversy between Chomsky and Lakoff on this issue. For example, consider
the following argument from Lakoff (1969c):

Of course, the Halliday-Chomsky account of focus is not quite
correct. For example, Halliday and Chomsky assume that the constituent
bearing main stress in the surface structure is the focus,
and therefore that the lexical items in that constituent provide
new rather than presupposed information. This is not in general
the case. Consider (37).

(37) The TALL girl left.

Here the main stress is on TALL, which should be the focus according
to Halliday and Chomsky, and should therefore be new, not given,
information. However, in (37), TALL is understood as modifying
the noun in the same way as the restrictive relative clause who
was tall. Since restrictive relative clauses are presupposed,
it follows that in (37), it is presupposed, not asserted, that the
girl being spoken of was tall. Thus the meaning of the lexical
item TALL cannot be New Information. Another possible candidate
for focus might be the whole NP the tall girl. But none of the
lexical content of this NP is New Information, since it is presup-
posed that the individual under discussion exists, it is presupposed
that that individual is a girl and it is presupposed that she is
tall. None of this is new. In (37), it is presupposed that some
girl left, and it is presupposed that SOME girl was tall. The new in-
formation is that the girl who was presupposed to have left is co-
referential with the girl who was presupposed to be tall. The sem-
antic content of the focus is an assertion of coreferentiality.
In this very typical example of focus, the lexical semantic content
of the surface structure constituent bearing main stress has nothing
whatever to do with the semantic content of the focus.

[Lakoff (1969c) p.33]

Part of the problem is the insistence of both Chomsky and Lakoff
on characterizing Focus and Presupposition as semantic categories. The
fact that they can both do so and at the same time mean quite different
things by those terms indicates that some distinction needs to be drawn
between some of the categories which have been indiscriminately lumped to-
One of the reasons for preferring the particular extension which I have proposed, namely to attempt to account for discourse regularities by means of context-sensitive rules operating across sentence boundaries, is that this approach provides a natural way of capturing the distinction between the "meaning" or (a much better term, I think) "function" of focus and presupposition in the discourse sense of Chomsky and Halliday and the cognitive meaning of Lakoff's presupposition.

In the end, one formalism (in the sense of "framework" or "notation" as opposed to empirically different restrictions on formal devices) is as good as another. It is immaterial to the discussion to follow whether Focus is assigned by an arbitrary rule and some discourse-interpretive component accounts for discourse well-formedness judgments; or whether Focus is triggered by a "Focus" feature generated in the base and associated with a particular constituent, and discourse well-formedness is accounted for by matching the set of base-generated presuppositions with sentences in preceding discourse; or whether, as I suggest, Focus is assigned by a discourse-sensitive syntactic rule.

I much prefer the latter approach for the reasons given: it specifies an explicit means of representing the distinction between discourse-conditioned features and cognitive-semantic features, and it provides a device for explicitly (at least in principle) stating constraints on well-formed discourse.

Whereas formalisms may differ in apparently uncountable ways and yet, under the proper interpretation, account for the same empirical regularities, it is important to recognize that the empirically significant theoretical unit is a formalism plus an interpretation of that formalism. The term interpretation should be taken to mean a mapping from expressions of the formalism onto observable empirical reality.

It is easy to mistake differences in formalism for direct representations of empirical differences. This happened in the early days of physical optics, when there was an apparent conflict between the wave "theory" and the particle "theory" of light. There seemed at first to be an important empirical difference, in that the wave theory required a fluid for the waves to move in, whereas the particle theory did not. The discovery that there was no empirical evidence for the existence of such a fluid did not, however, destroy the wave theory. Light was still describable as waves in space, even if there was no fluid. What had to be given up was an empirical hypothesis formulated within the theory, that the "fluid" of the theory correlated with an empirically observable physical fluid.

Thus it should be recognized that the choice before us is not between two formalisms alone, but between two interpretations of formalisms. Either approach will have to account for the same phenomena, and presumably a resourceful partisan of either view could find a way to make his favored approach work.

2.2.6 In this and the following subsections, I will argue that English Focus Assignment, like Turkish Extrapolation, must precede Deletion, and for similar reasons. I will suggest that these two rules, from a discourse-functional point of view, are doing the same job, i.e., placing presupposed constituents in a position of extreme de-emphasis while placing marked emphasis on a normally non-emphatic constituent.
In this section I will examine more closely the nature of these rules, and similar focus-marking rules in other languages, to determine whether they have any formal characteristics in common, in terms of which the generalizations informally sketched above can be stated.

This is an extremely important theoretical issue, since I am claiming as an indispensable part of my hypothesis about gapping phenomena a universal ordering among certain transformations. In order for this claim to be meaningful, I must be able to specify in universal terms exactly what transformations are involved. In the case of English Focus Assignment and Turkish Extrapolation, the formal similarity between the two rules, which I want to call the same for purposes of the universal ordering requirement, is far from obvious.

Let me state the two rules in something like their most general formulation, omitting certain exceptions and conditions which can be accounted for by independent considerations. I assume that both rules are either conditioned only by discourse conditions (in which case Focus is taken to be a surface phenomenon not affecting the semantic reading of a sentence, thus recognizing a distinction between discourse-conditioned features and cognitive-semantic features) or obligatory and triggered by a "Focus" feature generated in the base and associated with a particular constituent (in which case discourse features are not formally distinguished, at least not in any obvious way, from semantic features). The non-distinctness of the two approaches has been discussed in the last subsection. For the purposes of exposition, I assume the former interpretation in what follows.

Turkish, like English, has a "sentence accent", which is realized as the peak of the intonation contour occurring on one syllable in the sentence. I will refer to the major constituent containing this syllable as the Focus.

The facts of Focus Assignment in Turkish are quite simple. Briefly, the Focus in the unmarked case is the constituent immediately preceding the verb, and Focus may appear on any other constituent only with the introduction of a phonological juncture separating the Focus from the immediate preverbal constituent. This case will be left out of consideration for the time being. Constituents actually mentioned in previous discourse (and 'recoverable', in the sense developed earlier) and constituents highly predictable from the speech-situational context (such as personal pronouns especially in the first and second persons) may be extraposed, i.e., moved to post-verbal position. No post-verbal constituent is ever the Focus and a juncture never appears between the verb and any post-verbal constituents.

Preverbal Scrambling, which is certainly not one rule but at least two and perhaps more, has as one of its effects the placement of various preverbal constituents in the position of Focus, i.e. the immediate preverbal position. This rule does not concern us directly at this time, since it is independent of the Extrapolation rule; but it too has a parallel in English which will be noted below.

(22) The Turkish Extrapolation rule:

\[
X \text{ NP } Y \text{ V } Z \rightarrow X \text{ Y V NP } Z
\]

Condition: NP is identical and coreferent with an NP in previous
discourse in such a way that it is "recoverable" or is a first or second personal pronoun or a deictic; in other words, NP is presupposed.

(It should be remembered that this condition is only a crude first approximation to the notion of discourse-presupposition.)

I do not formulate this as a simple rule of rightward permutation around a variable as Ross (1957a) suggests because this rule has to reapply to its own output: there are (quite rare) cases of more than one NP being extraposed, as in

(23) seviyor bani o.
loves me he
"He loves me."

and if the rule were formulated as Ross suggests, it could go on permuting the postverbal constituents, once they had become postverbal by an original extraposition, forever. This would provide every grammatical sentence involving multiple extrapositions with an infinite number of derivations. The rule as formulated avoids that unfortunate consequence, since it specifies permutation around the verb.

This is, of course, a purely formal device. Other ways of preventing, or ignoring, the infinite-derivation problem could be devised. The important point is that there is a formal difference between this rule and such rules as the extraposition rules of English.

English has several "extraposition" rules, mostly optional, which place various constituents in final position. These rules, unlike the Turkish Extraposition rule, have to be formulated as permutation of a constituent around a variable, i.e., as true extraposition rules in Ross's sense. Examples of such rules are (a) Extraposition from NP, (b) Complex NP Shift, (c) Extraposition (of sentential subject): 7

(a) (24) The claim that Murray steals from little old ladies has been made.

(25) The claim has been made that Murray steals from little old ladies.

(b) (26) He threw the letter which he had not decoded into the wastebasket.

(27) He threw into the wastebasket the letter which he had not decoded.

(c) (28) That John refused to pay up disturbed us all.

(29) It disturbed us all that John refused to pay up.

Note that in the case of these English extraposition rules, it is not possible to formulate them as permutations around a particular constituent, as is the case with the Turkish Extraposition rule. There is no fixed constituent about which the extraposition can be specified; it must be specified as movement to final position in the sentence.

Whether or not the formal distinction I propose between Turkish Extraposition and the extraposition rules of English is the most illuminating one, I will choose it as diagnostic: I will refer to such rules as the Turkish Extraposition rule, which permute constituents rightward around some fixed constituent (which I will refer to as the pivot of the extraposition) as relative extraposition rules, because the extraposed
constituent is extraposed relative to the pivot. Rules like the extraposition rules of English mentioned above will be called absolute extraposition rules, because the extraposition is to the absolute final position in the sentence.

English seems to have no relative extraposition rules: Particle Movement might seem to be such a rule:

(30) Murray called up his lawyer on the telephone.
(31) Murray called his lawyer up on the telephone.

But this rule permutes a particle only about an immediately following NP, so that it cannot be formulated with a variable. Thus if we distinguish between permutation rules which are formulated without variables and extraposition rules which are formulated with variables, this rule is not an extraposition rule.

That these rules do not have the defocussing effect of Turkish Extraposition is clear. Any constituent extraposed by such rules can either have Focus (unmarked, since on final constituent) or not (in which case Focus is marked and falls on some earlier constituent). In the latter case the postfocal constituents must be "presupposed" in exactly the same sense that extraposed constituents in Turkish must be; i.e., they must either have been previously mentioned and "recoverable" (in an as yet imprecisely understood sense) or must be highly predictable speech-situationally, such as first and second personal pronouns.

It is clear, however, that the various extraposition rules in English do not affect Focus Assignment, since Focus may fall on any final constituent, whether originally final or placed there by an extraposition rule, and any final constituent can be "out of Focus", i.e., may be in the postfocal "presupposed" position.

This means that in English, presupposed constituents are gotten into postfocal position by the assignment of Focus (by the Focus Assignment rule) to a constituent other than the final constituent. As noted by Halliday, all constituents in postfocal position must be presupposed. This English Focus Assignment (repeated here) must assign Focus in such a manner that only "presupposed" constituents are in postfocal position.

(30) English Focus Assignment

\[ X A Y \rightarrow X * \text{focus} \ Y \]

where \( A \) is the rightmost non-presupposed constituent, in the sense outlined above.

Note that English has another rule which assigns contrastively-marked Focus (characterized by "extra-heavy" stress) optionally on any constituent which is not "presupposed". This rule bears some similarity in effect to a similar rule in Turkish which places extra-heavy stress on some preverbal constituent, or on the verb if it is immediately preceded by juncture (usually everything else has to be extraposed before this can happen). But this rule, like that one, does not concern us here.

First notice what is different about the Focus Assignment rule in English and Extraposition in Turkish: in English, unmarked Focus is on whatever constituent happens to occur in final position. In Turkish, on the other hand, unmarked Focus is defined relative to a given constituent, namely the verb, and is on whatever constituent happens to oc-
cur in immediate preverbal position.

Now notice what is similar: unmarked Focus has a rigidly defined position in each language, and the rule in general (Focus Assignment in English, Extraposition in Turkish) gets presupposed material into post-focus position. But since English unmarked Focus is defined in terms of sentence-final position, de-focussing must involve placement of the Focus on some non-final constituent; whereas Turkish Focus is defined in terms of constituent structure, and de-focussing involves movement of presupposed material rightward past the constituent with respect to which Focus is fixed.

Notice that Focus did not have to be mentioned in the Turkish Extraposition rule, since it is automatically defined with respect to the constituent V; presumably a later rule can automatically assign the phonological features of focus to the constituent immediately preceding the verb.

Remember also that the Turkish Extraposition rule could not be formulated as permutation of a constituent around a variable, but had to refer to the constituent V. It could equivalently have referred to unmarked Focus position, if there were some convenient way to mark it.

What the two rules have in common is that they effect permutation of constituents with unmarked Focus position, in one case by placing Focus on some "marked" (i.e., non-final position) and in the other case by postposing constituents.

The question is how to characterize this common effect, since the Turkish Extraposition rule, as formulated in (22), makes no explicit reference to Focus.

What I propose to do is to formulate a universal generalization about rules which extrapose constituents by permutation around a given constituent, as is the case in (22), as opposed to rules which effect permutation rightward around a variable, like the various English extraposition rules. I will claim that the former type of rule, if it permutes an otherwise unrestricted constituent under conditions of identity with a preceding constituent in discourse, or when the constituent is a first or second person pronoun (which can be absorbed into the more general class of discourse-presupposed constituents if a performative sentence containing these constituents is assumed to be present in the underlying structure of every sentence) is universally a rule which places a constituent in postfocal position. The empirical claim is that no rule with the specified formal properties can ever fail to have the effect of placing the extraposed constituent in postfocal position. Another way to state this claim is to say that there can never be any reason for rightward permutation of "presupposed" constituents about a particular specified constituent except in order to place the presupposed constituents in postfocal position which is defined for the language in question relative to the fixed constituent about which presupposed constituents get permuted.

Thus I establish a formal difference between absolute extraposition rules like the extraposition rules for English, and relative extraposition rules like the Extraposition rule of Turkish, and claim that relative extraposition rules which have only "presupposition" of the extraposed constituent as entry condition are universally Focus-permuting rules.

The thinking underlying this distinction is simple: there are two
ways in which unmarked Focus position can be marked in a given language. One way, which is how it is done in English, is that unmarked Focus can be defined with respect to some fixed position, such as final position, without regard to constituent structure. The other way, which is how it is done in Turkish, is that unmarked Focus can be defined relatively with respect to some particular constituent, such as the verb. Languages which mark Focus in the former manner have a Focus Assignment rule; languages which mark Focus in the latter manner have a relative Extraposition rule. Any rule of either type will be referred to henceforth as a Focus rule. A Focus rule is any rule which places constituents in postfocal position. The claim about relative extraposition rules is that any relative extraposition rule which presupposes presupposed constituents is a Focus rule.

2.2.5 Evidence from several languages will be presented below in support of this universal claim. But at this point let me restate, in terms of the distinctions just established, the universal claim about rule ordering made earlier:

(31) In any language, if there is a Focus rule, it precedes Coordinate Deletion.

The reason this claim should be true is not immediately obvious. It follows from general considerations of the sort that were appealed to above in arguments that Extraposition in Turkish must precede CD and will here be appealed to to show that English Focus Assignment must precede CD. The general form of the argument is that if Deletion is assumed to precede Focus, a special condition will have to be placed on Deletion to characterize as ungrammatical gapped structures in which the gapped element would be assigned Focus by the Focus rule and some postfocal element which is not gapped, and therefore contrastive in the conjoined structure, would be defocussed.

For a specific example, consider English. The sentence

(32) *John plays the bugle and Larry the saxophone.

must somehow be blocked. Likewise in Turkish

(33) *Ahmet yedi yumurtayi, Mehmet patlican.

Ahmet ate the egg Mehmet the eggplant

must also be blocked.

In both cases what has gone wrong is that Capping has occurred in the right conjunct, deleting the verb; and Focus has applied in the left conjunct placing the object in defocus and the verb in Focus.

It was argued in §2.1 that *(33) could be blocked if Extraposition (there called Scrambling) were ordered to precede Deletion, since some constraint was apparently necessary in any case to prevent Extraposition from applying in conjoined sentences with like verbs and unlike objects.

(34) *Ahmet yedi yumurtayi, Mehmet yedi patlican.

Ahmet ate the egg Mehmet ate the eggplant

Given the discussion of the last section, we now have a more general explanation of this restriction: there is no way that both yumurtayi and patlican can be presupposed. It is possible that they both might come in previous discourse, but in that case, either of the Focus rules could be applied to the other. But they cannot both be presupposed.
variable" in its own sentence: it is impossible to pronominalize or delete either of these NP's.

If, on the other hand, we order Deletion before Focus, this explanation is not available. Nothing prevents the deletion of the verb from the right conjunct; then if the Focus rule applies freely in the left conjunct, the ungrammatical *(33) must result.

Note now that the same explanation is available for English *(32); for *(35), which must be the underlying form of *(32) before Deletion, is also no good:

(35) *John plays the bugle and Harry plays the saxophone.

We might try to defend the ordering of Deletion before Focus by claiming that Focus is an across-the-board rule and must do the same thing in both conjuncts, but this is false: (36) is perfectly good English, (37) is good Turkish:

(35) John bought the bugle, and Harry bought the saxophone.

(37) Ahmet yedi patlıcanı, Mehmet yumurtaydı yedi.

Ahmet ate the eggplant Mehmet the egg ate

(36) is a possible reply to the assertion "John rented the bugle and Harry bought/rented the trombone."

But in both cases, Gapping is blocked:

(38) *John bought the bugle, and Harry the saxophone.

(39) *Ahmet yedi patlıcanı, Mehmet yumurtaydı.

Strangely enough, we can't gap here, even though bought in (36) is destined in the second conjunct (cf. footnote 8).

Thus if we want Focus to follow Deletion, we have to place an ad hoc constraint on Focus to prevent it from applying so that Focus falls on a constituent which is the left conjunct of a conjoined structure and whose corresponding constituent in the right conjunct has been deleted.

In Turkish the facts are particularly clear. There are absolutely no gapping patterns like

(40) *SVO SO

(which is the schematic equivalent of *(39) or *(33) and since the extraposed SVO is by itself grammatical, there are only two ways to block patterns like *(40): either a restriction like that just outlined must be placed on Extrapolation in sentences conjoined with sentences where Deletion has occurred; or Deletion must follow Extrapolation and be made sensitive to the order of constituents. But (cf. § 1.1) this condition is not already. Deletion requires identity of constituent structure.

If we choose the latter option *(40) is blocked in a natural manner by two independently necessary conditions: *(39); *(SVO SO) is blocked because it must come from (37); (SVO SÖV) and Gapping requires identity of constituent structure. This requirement has been discussed in detail above, § 1.1. *(33): *(SVO SO) is blocked because its input *(SVO SVO) cannot arise.

This argument led in § 2.1 to the conclusion that Turkish Extrapolation had to precede Deletion. It is the purpose of this section to show that the argument is universally valid, and that in any language which has a Focus rule, that rule must precede Deletion.
alternative is just as bad in English as it is in Turkish) we are forced to an interesting conclusion: Capping is sensitive not only to identity of structure, but also to identity of Focus. Otherwise it is not possible to block *(35), since deletion of the verb from the second conjunct of (35) would not violate any phonological well-formedness condition.

It is not so surprising that Extraposition in Turkish affects structures in such a way that Deletion is sensitive to its effect, since Extraposition rearranges constituents and Deletion requires identity of constituent structure; but we are not used to thinking of such a "low-level" phenomenon as Focus placement as being crucial to considerations of structural identity. Yet unless we are willing to place the mentioned constraint on Focus Placement in gapped structures, we must conclude that it is.

To be explicit: Deletion in English requires not only identity of constituent structure, but also identity of Focus placement.

The postulation of the universal ordering relation Focus→Deletion rests on the empirical assumption that the Deletion rule is universally sensitive to identity of constituent structure and to identity of Focus placement. If this is the case, then clearly considerations like those above lead us in every individual language to postulate the assumed order.

The validity of this argument clearly depends on the presumption that the two kinds of Focus rules discussed above exhaust the possible types of Focus rules.

Thus the claim that Focus universally precedes Deletion depends on an assumption that so far has been tacit, that:

(41) All Focus rules either extrapose (i.e., permute rightward) presupposed constituents about a fixed pivot or place Focus so that only presupposed constituents are to the right of Focus; and no other rules have either effect.

In other words, postfocal position is universally a position of de-emphasis in surface structure, a position where presupposed constituents get placed. This is an extremely powerful claim about the relative order of Focus position and defocussed material in surface structures. It would be falsified by any rule in any language which was found to place presupposed constituents before Focus position, i.e., by moving them to the initial position in the sentence, etc. I will devote some space below to a consideration of rules in various languages which effect discourse-conditioned and stylistic movement of constituents.

Presuming the correctness of this assumption, we can ask whether the type of Focus rule which a language can have is arbitrary, or predictable from some other structural feature of the language. It was pointed out above that English, which has absolute extraposition rules, has a Focus rule which assigns Focus to the rightmost non-presupposed constituent. English has no relative extraposition rules, no rule of the form:

(42) X A Y B Z → X Y B A Z

It is also the case that such a rule doesn't occur in Russian, French, German, Spanish, or any other SVO language I know of.
Extrapolation rules like (42) are found in Turkish, colloquial Japanese, Korean, Persian, and Amharic—all SOV languages. In all these languages this rule has exactly the de-focusing effect which it has in Turkish, and in all of them it is necessary to order this rule before the rule of Coordinate Deletion.

On the basis of these facts, I state the following generalization:

(43) Languages like Turkish which have basic SOV order have relative extrapolation rules.

Languages like English, which have basic SVO order, have absolute extrapolation rules, and (if they have a Focus rule at all) a Focus Assignment rule like English.

Now, is there an explanation for this correlation? Note that languages like Turkish can have unmarked Focus relatively fixed only if it is fixed relative to some constituent that can be depended on to be there. This is fine if it is the V in an SOV language. But unmarked Focus in English cannot be fixed relative to the final constituent because there is no reliable final constituent, so it is fixed relative to final position.

Given the acceptance of assumption (41), we would predict that while SOV languages might typically have relative Focus, languages like English with SVO order must have absolute Focus, since Focus is normally required to be able to fall on the final constituent, which it must do if there are no presupposed constituents; and the end of the sentence is not marked in English by any particular constituent.

So far as I know, all SOV languages have unmarked Focus like in Turkish, on the rightmost position that, before application of the Extrapolation rule, can be occupied by an NP. If this is universal, we could state a unified generalization about the position of unmarked Focus: namely that it is universally on the rightmost position which can be occupied by an NP before application of the Focus rule. This would account for why SOV languages have extrapolation Focus rules, and SVO languages cannot.

This would also allow us to explain why SOV languages never have absolute extrapolation rules. For Ross was right in his assertion that SOV languages have no rules which permute an element rightward around a variable; once the distinction has been made between absolute and relative extrapolation rules, we can state the correct generalization that the former type of rule never occurs in a SOV language. (And to my knowledge, the only relative extrapolation rule that occurs in such languages is the Focus rule).

The reason that SOV languages never have absolute extrapolation rules is simply that such a rule would inevitably have the effect of placing the extraposed constituent in defocussed position, since Focus position is defined with respect to the verb. Hence the force of assumption (41): it predicts that in no language which has a defined position for unmarked Focus will non-presupposed material ever get placed to the right of the Focus position. But if a rule like Extrapolation from NP, which is insensitive to whether the extraposed S is presupposed, were inserted into the grammar of Turkish, it would have precisely this effect. So it is a
universally a constraint on the relative position of Focus and non-presupposed material, which requires that SOV languages have no absolute extraposition rules.

And this explains what was right about Ross’s proposal: SOV languages never have absolute extraposition rules, but generally do have relative extraposition rules.

SOV languages, on the other hand, generally have absolute extraposition rules, but never have relative extraposition rules: because they always have absolute unmarked Focus, i.e., unmarked Focus position is inevitably on the final constituent.

2.2.6 Summarizing the conclusions of the preceding discussion, I state the following universal generalizations:

(44) Languages which have SOV order universally have Focus (if Focus is defined at all) on the preverbal constituent.
Languages which have SVO order have unmarked Focus, if it is defined at all, on the final constituent.

(45) SOV languages have relative extraposition rules for getting presupposed material into postfocal position; they never have absolute extraposition rules. SVO languages have Focus Assignment rules for getting presupposed material into postfocal position, if they have anything; they may also have absolute extraposition rules, which do not effect defocussing of the extraposed material.

Note that it is a necessary consequence of these generalizations and the assumption (41) about the nature of Focus rules that absolute extraposition rules in SVO languages must all precede Focus rules. Otherwise they would inadvertently defocus the extraposed material.

As far as accounting for gapping patterns (in the sense of simple order of constituents and position of gaps in gapped structures) is concerned, the ordering of the rules of Focus and Deletion is crucial only for SOV languages, since Focus rules in SVO languages do not effect reordering of constituents.

In SOV languages, it can now be established that Focus universally precedes Deletion. This follows from the fact that Deletion requires identity of constituent structure, so that SVO SOV, where Extraposition has applied in one conjunct but not the other cannot be gapped to get *SVO SO; and from the independent fact that Extraposition cannot apply in both conjuncts to get *SVO SVO if the verbs are alike and the objects unlike, since unlike objects cannot both be presupposed. Thus the only two sources for the pattern *SVO SO are blocked.

What this means is that, given the nature of Extraposition in SOV languages and the nature of Deletion, the assumption of the ordering: Extraposition → Deletion has as an empirical consequence the ungrammaticality of the pattern *SVO SO in such languages.

To make it clear what is being claimed by this universal ordering requirement, consider any language which, like Turkish, has basic SOV order and has a relative extraposition rule which effects defocus of the extraposed material. The universal ordering hypothesis
predicts that such a language, although it can extrapose objects to get sentences of the form SVO, can never get a gapping pattern like *SVO SO. This prediction follows from the perfectly general characteristics of Deletion and Extraposition and must be universal if the ordering hypothesis is correct.

To presume that the ordering Extraposition-Deletion is not universal would make no prediction at all, except that one might expect to find an SOV language which had the gapping pattern SVO SO.

The empirical support for the correctness of the universal ordering hypothesis is simply that this prediction appears to be correct. There are no known SOV languages which have the gapping pattern *SVO SO. This fact is implicit in the data presented by Ross (1967a). The explanation which he proposed rested on the assumption that languages with underlying SOV order never had extraposition rules of any kind, so that any language with dominant surface SOV order and any gapping other than SO SOV had to have underlying SVO order and an obligatory V-postposing rule. This hypothesis had to be rejected on several grounds, one being that Turkish and Japanese do have sentences with SVO order.

The present hypothesis explains this fact in an entirely different way. The relation of the direction of Gapping to underlying order of constituents has been abandoned; the hypothesis that Gapping is an anywhere rule has been rejected, and the assumption of underlying SVO order for Turkish and similar languages has been rejected. All of these were crucial assumptions in Ross’s explanation.

The hypothesis that Extraposition universally precedes Deletion provides an explanation for this fact and I assert that it is the only possible explanation. For if the opposite order ever occurred, we would have to expect that the pattern *SVO SO would be generated in some SOV language.

It should be noted that this argument also depends crucially on the possibility of forward Deletion of the final verb in Turkish, and thus is based on an assumption inconsistent with Ross's gapping hypothesis.

This is so because the pattern (b): SOV SO, which is grammatical in Turkish, cannot be derived by Deletion from *SVO SVO with subsequent Scrambling; thus it must be derived directly by Deletion from SOV SOW, as my original hypotheses require.

As was noted above, the postulation of a universal ordering relation between two transformations is a new development in transformational theory. Only very recently have there been any attempts to formulate transformations universally at all (cf. Postal 1970a; Ross 1967a,b; Bach 1971); Bach in particular has proposed such universal
formulations as a means of constraining the power of transformations and thus strengthening linguistic theory.

The establishment of a set of universal ordering relations like the one postulated here would provide a very powerful means of further restricting the class of possible grammars. Given a universal set of transformations, together with a universal set of ordering relations among these transformations, we could conceive of transformational theory as providing a skeleton grammar: a set of rules among which the crucial ordering relations are already (universally) defined. Particular grammars could modify this skeleton by omitting rules, perhaps by adding rules of specified types, but could not differ from the skeleton in having a different ordering than that holding between rules crucially ordered in the skeleton.

This is not to say that languages could not differ between each other as to rule ordering; only that certain specific rules (or types of rules) may have universally a particular crucial ordering relation.

2.2.7 Focus rules

I have argued above that there is a formal similarity between English Focus Assignment and Turkish Extraposition, and that in a sense these are the same rule. I am not able to present an argument similar to that just given for the ordering Extraposition-Deletion in SOV languages, that in SVO languages the ordering Focus-Deletion is universal. There is not enough information available about the position of unmarked Focus in individual languages, and almost none about the interrelation between Focus and Deletion.

From my investigation of Focus and Deletion in English, together with what facts I have been able to assemble for other languages (principally German, French, Spanish, and Russian) I think that the generalization is well founded, that Focus and Extraposition are for the purposes of the universal ordering hypothesis the same rule, i.e., that in SVO languages, Focus precedes Deletion.

The basis for this assumption is that in all the languages I could investigate, the facts are as in English. All of these languages (with the exception of French, which has no Focus rule), have unmarked Focus on the final constituent and a rule of Focus Assignment which places Focus on the rightmost presupposed constituent. In all of these languages, Deletion must be blocked when there is Focus on one verb but not on the other: *SVO So does not occur. And Deletion of a focussed verb is impossible: *SV0 So does not occur.

Thus I suspect that if more information on Focus in SVO languages were available, a universal ordering argument similar to that given for SOV Languages could be constructed.

2.3 Topicalization

2.3.0 In this section I will briefly discuss a related class of rules, the rules of Topicalization, and show that the discourse condition on these rules is not the same as that on Extraposition. I will then briefly discuss the general phenomenon of Scrambling, and suggest that there is an interesting interrelation between Scrambling and Extraposition.
2.3.1 In an earlier section (§ 2.1), I distinguished between Topicalization rules and Extraposition rules. Topicalization rules are rules which move a constituent to the beginning of the sentence under conditions strangely similar to the conditions of Extraposition: the fronted, or topicalized constituent must be presupposed in a sense, but in a sense quite different from the sense in which extraposed material is presupposed.

The difference is very clear in a language like Turkish, which has "pronoun deletion": an extraposed constituent can always be deleted without change in sense or discourse function: (1) is equivalent to (2) (i.e., discourse-equivalent: wherever (1) can occur in a discourse, (2) can also occur and means exactly the same thing):

(1) Hasan yedi yumurtayı.  
Hasan ate the egg
(2) Hasan yedi.  
Hasan ate (it)

But (3), in which the object has been topicalized, is not equivalent to (4), in which the object has been deleted:

(3) Yumurtayı, Hasan yedi.  
(4) Hasan yedi.

The difference is something like this: in (1), (2) and (4), the only thing that has been eaten, as far as this discourse is concerned, is the egg; in (3), more than one thing has been eaten, one of these things is the egg, and Hasan ate that.

In English, the corresponding sentences are:

(1') Jerry ATE the egg.
(2') Jerry ATE it.
(3') The egg, JERRY ate.
(4') JERRY ate it.

Note that we never get:

(5') *It, Jerry ate.

In (1'), (2') and (4'), the only thing that has been eaten is the egg; in (3'); more than one thing has been eaten, and one of these things was the egg, and Jerry ate that. But we know from the fact that Definitivization has applied that the egg in (3') has been mentioned in previous discourse; only it cannot be presupposed in (3') because there are other things that Jerry might have eaten.

The ungrammaticality of *(5) shows that definite Pronominalization is sensitive to the same distinction, and thus, as expected, correlates with NP-Deletion in Turkish.

There are two crucial differences between Topicalization and Extraposition: Topicalization moves constituents to the left when they have been previously mentioned but cannot be presupposed (i.e., when there is not enough information in previous discourse to predict or "recover" them) and Extraposition moves constituents to the right when they are presupposed.

I argued above (§ 2.1) that Topicalization in Turkish and in English and German had to be ordered after RCR. I suggested that this ordering relation (like the relation Extraposition-Deletion) was un-
versal, and that Topicalization was universally a root transformation. I gave no particular arguments in support of the claim about the universal ordering \( \text{LCO} \rightarrow \text{Topicalization} \), and the root character of Topicalization, other than the arguments given in §2.1 that this order is necessary in Turkish and the fact that in all the SVO languages I know of which have Topicalization, sentences of the form OSV SV are possible, but not sentences of the form *OS OSV (e.g., "the potatoes, Mary bought and Sally cooked"; *"the potatoes Mary, and beans Sally, cooked"). Koutsoudas (1970) argues that OSV SV can be got by first topicalizing to get OSV OSV and then deleting to get OSV SV; but as noted above (§2.1) there are many reasons for rejecting this proposal.

The most obvious thing wrong with it is that, as noted in §2.1, a sentence of the form OSV OSV where the objects are alike, as "the potatoes, Mary bought, and the potatoes, Sally cooked", is ungrammatical; so that if this is to serve as input to the Deletion rule to get "The potatoes, Mary bought and Sally cooked", Deletion, which is otherwise optional, will have to be made obligatory in just this case. Since the facts can be accounted for under the assumption of the ordering \( \text{LCO} \rightarrow \text{Topicalization} \), without any such condition on Deletion, the Condition Principle dictates the choice of ordering which has been assumed in this thesis. This in addition to the fact that Koutsoudas' hypothesis gives us less for derived structure as noted in Chapter 1, footnote 14, and that under his hypothesis, it is impossible to block SVO \( \rightarrow OSV \rightarrow *OS \text{ OS V} \).

I will here offer some suggestions as to why this order should be preferred over others with forms. I cannot provide an irrefutably

argument, because of the shortage of information about Topicalization rules; the generalizations on which this discussion is based are drawn from an extremely scanty investigation of a few languages which I happened to be able to get information about. However, this proposal seems to be worth making, since if substantiated by future investigation, it would add another crucial ordering to the universal skeleton.

I indicated above that in all languages I am familiar with, Topicalization, if it exists, is restricted to the topmost sentence. \( \text{QR} \) is a rule which creates a new topmost sentence:

\[ S_1 \quad \text{and} \quad S_2 \]

\[ \Rightarrow \quad \text{A} \]

when the constituent (A) is raised out of \( S_1 \) and \( S_2 \), the new topmost \( S \), \( S_4 \), is created.

The assumption that \( \text{QR} \) precedes Topicalization leads to an empirical prediction: namely that in a language which has Topicalization, structures like (7) which result from (6) after Topicalization will occur:

\[ S_1 \quad \text{and} \quad S_2 \]

\[ \Rightarrow \quad \text{A} \]

\[ S_4 \]

\[ \Rightarrow \quad \text{S}_1 \quad \text{and} \quad \text{S}_2 \]
But Topicalization will never occur in the sentences $S_1$ and $S_2$. So far as I know this is the case.

Thus, we find sentences with structures like (6):

(8) Alvin gave a large teddy bear, and Morris sent a fine bouquet of dandelions, to Martha.

and (7):

(9) To Martha, Alvin gave a large teddy bear and Morris sent a fine bouquet of dandelions.

But we cannot topicalize within the conjoined subsentences in (8) (I change the articles so that it will be clear that Topicalization is not blocked by indefiniteness):

(10) **The large teddy bear** Alvin gave and Morris sent a fine bouquet of dandelions, to Martha.

(11) **Alvin gave a large teddy bear, and the fine bouquet of dandelions Morris sent, to Martha.**

(12) **The large teddy bear Alvin gave, and the fine bouquet of dandelions Morris sent, to Martha.**

Similar facts in all the other languages which I have investigated lead to the same conclusion, so that both the assumption that Topicalization is a root transformation and the assumption that RNR creates a structure like (6) are supported.

2.3.2 Scrambling

Topicalization is just one aspect of the more general phenomenon referred to as Scrambling. This is actually a cover term for a very complex set of rules, which together have the effect of permuting constituents, apparently arbitrarily, to produce semantically equivalent "stylistic" variations of an underlying sentence. Actually, it is clear that there are discourse conditions on Scrambling, just as on Extroposition and Topicalization (which have been extracted from Scrambling by isolating their conditions and effects). A thorough study of these conditions is in order, but it is beyond the scope of this discussion.

I will not discuss Scrambling in detail here, but only its relation to Extroposition and Focus. Since relative extraposition rules also effect permutation of constituents, I had to take pains to distinguish relative extraposition rules from other permutation rules; it is tempting to include them in the phenomenon of Scrambling. But there is an important difference between relative extraposition rules in SOV languages and Scrambling rules: Scrambling rules only permute constituents in the "domain of Focus" (i.e., the segment of a sentence preceding and including the constituent on which Focus is defined). That this permutation of prefocus constituents must be effected by a set of rules distinct from the extraposition rules which place constituents "out of Focus" is clear from the ordering arguments given above: extraposition rules must precede Deletion; and Topicalization, which is a "Scrambling" rule, must follow both Deletion and RNR.

Thus we can state the following generalization about the interrelation between Focus and Scrambling:
(17) If a language has a Focus rule, its application defines a "domain of Focus" consisting of that segment of the sentence to the left of and including the constituent on which Focus is placed.

The domain of Scrambling is the domain of Focus; i.e., the rule of Scrambling may permute only constituents in the domain of Focus.

Scrambling, it should be remembered, is not presumed here to be a single rule, but rather a class of rules: Scrambling rules are all those rules which effect late stylistic reordering, including Topicalization, Turkish "indefinite movement", etc., which do not require presupposition (in the very restricted sense used here) of any of the constituents involved.

Note that there is a difference in the operation of Scrambling in Russian as opposed to Turkish, which would otherwise remain unexplained, but is a natural consequence of the generalization stated in (17):

In Russian, Scrambling may permute not only NP's and adverbs etc., with each other, but the verb may be permuted with other constituents as well:

(18) a. Anna pils vódká.
    Anna drank vodka.
  b. Anna vódká pils.
  c. Pils Anna vódká.

But in Turkish, the verb is never scrambled with the other constituents;

the only rule which permutes any constituent with the verb is Extrapo-

(19) a. Hasan Ayşeýe yumurtayá verdi.
    Hasan to Ayşeýe the egg gave
  b. Ayşeýe Hasan yumurtayá verdi.
  c. Yumurtayá Ayşeýe Hasan verdi.
    etc.

(19) demonstrates Scrambling of preverbal constituents. Any of these constituents can be extrapoised if presupposed:

(20) a. Ayşeýe yumurtayá verdi Hasan.
  b. Ayşeýe Hasan verdi yumurtayá.
  c. Yumurtayá Hasan verdi Ayşeýe.
    etc.

But the verb never gets permuted with an unpresupposed constituent by
the Scrambling rule:

  b. *Ayşeýe verdi Hasan yumurtayá.
  c. *Yumurtayá verdi Hasan Ayşeýe.
  d. *Verdi Ayşeýe yumurtayá Hasan.
  e. *Verdi yumurtayá Hasan Ayşeýe.
    etc.

And if the Focus is on the verb in any of the sentences of (21), the sen-
tence is well-formed only in a discourse where all postverbal constituents
are presupposed.

Thus in Turkish it is necessary to postulate an Extrapo-

tion rule which extraposes presupposed constituents and a Scrambling rule which

permutes ("stylistically", i.e., I don't know exactly what the conditions

are) preverbal constituents not including the verb.

The fact that Turkish Scrambling cannot permute the verb with other

constituents is an automatic consequence of the fact that unmarked Focus

is on the immediate preverbal constituent, given the generalization stated

in (17). Likewise the fact that Russian Scrambling does include the verb

in its domain is a consequence of the fact that unmarked Focus in Russian

is on the final constituent, so that the verb may be, and usually is,

in the domain of Focus, and hence in the domain of Scrambling.

The validity of the generalization (17) is empirically verifiable

in a particularly strong way, since together with the generalizations

stated above in (2.2.44) and (2.2.45) that unmarked Focus in SOV lan-
guages is invariably on the preverbal constituent, and in SVO languages

on the final constituent, it entails the following universal constraint

on Scrambling rules:

(22) Scrambling in SOV languages never permutes the verb with

other constituents.

Scrambling in SVO languages generally does permute the verb

with other constituents.

If we were to find an SOV language with a Scrambling rule which

permutes the verb with other constituents, (17) or (2.2.44) or both would

be falsified. I know of no such language. This is another point where

Ross's account of these phenomena contains a sizable grain of truth, in-
deed is essentially correct. Ross noted that SOV languages generally do

not have a rule which permutes other constituents with the verb. His

conclusion, that any language which had such a rule must be SVO in un-
derlying order, cannot be maintained; however, the results of this sec-

tion allow a weaker generalization to be stated: in SOV languages, the

only rule which permutes a major constituent with the verb is the Ex-

trapolation rule which defocuses presupposed constituents.

The fact that Scrambling cannot permute the verb with other con-

stituents in SOV languages ought to be related in some obvious way to the

fact that SOV languages never have absolute extrapolation rules. This

would be the case if we had a solid formalization of the Scrambling rule

(or a "skeleton" of this rule: this idea due to Ross, cf. Ross (1967b))

which showed it to contain an absolute extrapolation. Unfortunately

no adequate formal statement of the rule or rules of Scrambling has

ever been devised. Ross (1967b) suggests formulating it as a pairwise

permuation of constituents which can operate on its own output. This

formulation has the unfortunate consequence that there is no way to con-

strain this reapplication not to keep happening even after all the possible

permuations of constituents have been derived, so that every well-formed

sentence in the language would have an infinite number of derivations,

and the length (number of rule applications) of a derivation would be

unbounded.

Lacking a formal characteristic on which to base a generalization

about Scrambling and absolute extrapolation rules in SOV languages, the
The closest we can come to relating these facts is to observe that both are consequences of (2.2.41) (unmarked focus in SOV languages on preverbal constituent) and the universal claim (2.2.41) that no rule other than the Focus rule ever effects the placement of a constituent in postfocal position.

Footnotes to Chapter 2

1. It has been proposed in various generative treatments of German that the underlying order of constituents is SOV, with a fairly late rule placing the finite verb in second position in the sentence. Cf., for example, Bierwisch (1963). This proposal does not affect the present discussion.

2. The notion of Root Transformation due to Emonds (1970); see that work for an extensive discussion of the class of rules which are limited to operation in non-embedded sentences. Emonds develops a generalization about movement transformations under which the fact that Topicalization is so restricted would follow automatically from its formal character as a movement transformation.

3. The best, almost the only, extensive discussion of such conditions is to be found in Halliday (1967b).

4. A similar approach is taken in Pope (1971), where it is shown that answers to yes-no questions have intonation contours which are correlated with features of the corresponding questions.

5. A related approach to discourse is taken in Heid (1965).
7. A discussion of these rules can be found in Ross (1967b), pessim.

8. It might be argued that (35) is possible under very special circumstances, namely as a contradictory response to the assertion 'John blows the bugle and Harry blows the saxophone'. This, however, is an instance of contrastive stress, which seems to be assigned by an independent rule (cf. Chomsky’s reservations in the passage quoted in the last subsection). It remains then to explain why Deletion cannot apply to such a sentence to produce (32). We might consider the possibility that this can be blocked by a general phonological output constraint which prohibits the deletion of a constituent bearing sentence accent (i.e., deletion of the Focus is prohibited). Such deletion, if it takes place after the assignment of Focus, so that no other constituent could subsequently acquire Focus, would leave a phonological segment bounded by junctures but contained no accented syllable. For a discussion of phonological well-formedness which demonstrates the universality of this requirement see Nelliday (1976).

Alternatively, we might postulate a constraint which directly prohibits deletion of the Focus, since the Focus is New information and thus unrecoverable. It will be clear, however, in the light of subsequent discussion in this section, that neither solution would account for the more general case.

9. I have not considered here languages with other basic orders. It is possible that the generalizations presented here for SVO languages hold for all non-SOV languages, and that the only possible ‘pivot’ is the verb.

10. Lakoff and Ross have made such claims orally, but not in print.

11. Lakoff and Ross have suggested (orally) universal ordering of all rules. This is an extremely strong claim, and it would take a staggering amount of research on the lines of that attempted here to establish it.

12. English Topicalization should not be confused with Y-Movement (cf. Kuno (1971)), which does not have a presupposition condition:

(i) Potatoes, Sarah Weinstein doesn’t like.

Y-Movement is an entirely different rule which can prepose far more stuff than a single NP, to which effect Topicalization is limited.

(ii) *Fond of many boys, Sarah Weinstein isn’t.

But Y-Movement only works with negated verbs:

(iii) *Fond of many boys, Sarah Weinstein is.

(There are other Y-rules, some of which have seeped to some extent into English, such as the Emphatic Preposing rule:

(iv) Pickles she wants on her sandwich (yet)!
or the Identity/Contrastive Preposing rule (which may be the same as Emphatic Preposing):

(v) Pickles you want, pickles/prunes you'll get.

The emphatic rule requires contrastive stress on the preposed NP. The identity/contrastive rule only occurs in a special identity/contrastive environment. These rules clearly have to be distinguished from English Topicalization.

Topicalization can only prepose constituents which have occurred in previous discourse (i.e., there is a presupposition condition of sorts, but a different one (cf. § 2.3.1) on the topicalized NP as well as on the subject): E.g., an indefinite NP can't be preposed by Topicalization:

(vi) *A sandwich, I'll put in my lunch basket.
(vii) The sandwich, I'll put in my lunch basket.

But the Y-rules can do this:

(viii) (Y-Movement) A sandwich, I wouldn't mind.

Topicalization cannot prepose 'role NP's' from sentences like (ix) to get *(x):

(ix) We elected Nixon President.
(x) *President, we elected Nixon.

But Emphatic Y-Movement can:

(xi) President we elected that ——!
Letter Footnotes - Chapter Two

a. (p.138) This is not so obviously true. Another possibility, which I failed to consider, is that (2) is an instance of forward deletion of the object in the first clause, controlled by an antecedent in the previous discourse (there must be one, or the conditions for extraposition of object are not met, cf. below).

b. (p.150) At any relevant stage of derivation. Under the hypothesis (cf. Bierwisch (1963)) that the finite verb even in main clauses originates in final position in underlying structure, the verbs in (31) would be final in their clauses at some stages of derivation, of course; but those stages are certainly too deep to be relevant to the application of RNR. In any case, as noted above (ch.2, note g), there would be no way for the verb to get back inside the right conjunct after RNR.

c. (p.151) This, of course, is not "object preposing", but a much more general rule.

d. (p.152) Ignorance and inexperience led to a blunder here. I failed to realize that (39) must be derivable by Topicalization across the board, without intermediate RNR. As for (37), it seems that some constraint has to be imposed that will prevent topicalizations in the conjuncts of a right node-raised structure, or one that will prohibit RNR from applying to conjoined structures in which Topicalization has taken place. It is not at all clear that this incompatibility is, as I argued in the ensuing pages, simply a reflection of the root-clause restriction on Topicalization.

e. (p.154) A grammatical sentence with the word order of (43) can be derived by a different reordering process, which moves an emphasized constituent into immediate pre-verbal position, and can apply in embedded clauses; but then the stress cannot be on the embedded verb as indicated, but must be on the focused constituent (the transported NP).

f. (p.155) See note d. It is not so clear why Topicalization cannot apply in such structures, since it can apply in the conjuncts of a coordination which has not undergone (or will not undergo) Right Node Raising. This argument (that Topicalization must be ordered after RNR) is not very persuasive.

g. (p.159) I was wrong about this. (9) can be used when the referent of onu is present in the speech situation.

h. (p.161) Again I failed to consider a case where onu is deictic, i.e. refers to some visible (and pointable-to) object in the immediate environment of speaker and hearer. Under such circumstances (2')a is [ ]. (2')b is also possible if the attention of both speaker and hearer is fixed on the object in question. What this means is that the conditions discussed in the text are not strictly "discourse" conditions, but rather more broadly "speech context" conditions.

i. (p.162) It was not, in fact, so argued, at least not successfully.

j. (p.177) I no longer know what is unfortunate about this.

k. (p.208) So what?
CHAPTER THREE

Constraints on Coordinate Deletion

3.0 In the preceding two chapters, the universal nature of the CD rule, and its relation to other rules effecting reduction in coordinate structures, was established, and the universal interrelation between CD and "stylistic" reordering rules was investigated.

In this chapter, I will investigate certain restrictions which affect the operation of the CD rule. Consideration of Gapping in English and other languages will show that some constraints must be placed on the rule of CD in order to prevent the production of ungrammatical sentences, which an unrestricted application of CD as proposed in Chapter 1 would produce.

I will show that any attempt to restrict the CD rule by placing restrictions on the application of the rule must lead to a complicated formulation of the rule which lacks generality and raises more questions than it answers. I will then show that a class of language-particular output constraints which are independently motivated constrain the operation of deletion rules in general, and that in order to capture a significant generalization and avoid placing complicated and redundant conditions on individual deletion rules it is necessary to incorporate these constraints into the grammar of English. Similar constraints in other languages will then be considered.

A second class of restrictions on CD will then be considered, and it will be shown that these restrictions are of a universal nature, and all follow from a universal condition on recoverability of deletions.

In order to formulate this condition, it will be necessary to extend the notion of recoverability beyond its original scope as outlined in the introduction to this thesis.

In the final section, I will discuss the problem of rule overlap, and suggest a general principle according to which certain kinds of rule overlap should be allowed.

3.1 The restrictions on CD
3.1.0 In the preceding chapter, we found that a closer examination of reordering and gapping phenomena forced certain alterations in the hypotheses which I originally proposed to account for these phenomena. These alterations in turn affect some of my earlier arguments, in that the modified hypotheses are seemingly incapable of accounting for certain facts which the original hypotheses seemed to account for quite straightforwardly; e.g., the nonexistence of a language with only the gapping patterns A and C.

Certain other facts remain unexplained as well: for example, in my original set of hypotheses, I proposed that for certain languages a restriction (\textit{a}) be placed on the Deletion transformation, to the effect that Deletion be constrained not to delete the final major constituent from any sentence. Later it was observed that the restriction had to be modified in some way to allow deletions that automatically result in reduct-
striction (R) on Deletion, when the two languages are otherwise quite similar as regards gapping behavior; why English cannot delete final NP's but Russian can delete final verbs; why (R) should mention final position, rather than some other position, say initial position. Do we have to accept the presence of the restriction (R) in a particular grammar as an isolated, idiosyncratic feature of the language, unrelated to any other facts? Or is it possible to seek some motivation (in the sense of some correlation with other phenomena) for the presence of (R) in a particular grammar? In this section I will present more detailed evidence that bears on the nature of this restriction.

3.1.1 It is clear that for English a restriction on CD is necessary, and that it cannot simply refer to the direct object of a transitive verb, or to final position. The same restriction applies when the final element is a sentential or infinitival complement (which to be sure are also objects of transitive verbs):

(1) John swore to Mary that he was a pervert and denied to Sylvia that he was a pervert.
(2) *John swore to Mary that he was a pervert, and denied to Sylvia.
(3) John hoped to get elected spittown cleaner and Harry expected to get elected spittown cleaner.
(4) *John hoped to get elected spittown cleaner, and Harry expected.

The restriction also applies to manner adverbs when in final position:

(5) John ran, and Peter walked, clumsily.

(6) John ran clumsily, and Peter walked.

(2) and (4) show that Deletion of final sentential complements and infinitival complements is prohibited; in (5) and (6) the non-equivalence of the sentences show that a final manner adverb cannot be deleted either. (Peter might have been graceful in (6)).

However, there are cases in which deletion of final element is apparently possible:

(7) John rán home, and Peter walked.
(8) Harry took the bús to Albuquerque, and Charley fléw.
(9) Margaret is using the Cádilllac this week, and Simon the Lincoln Continental.

where in each case the final modifying element of the first clause is taken as applying to both clauses. Note however that the deletion is possible (i.e., the modifying element is interpreted as belonging to both clauses) only with the major sentence stress as indicated (or on some other non-final constituent in the first clause: e.g., 'John ran home, and Peter walked' as reply to 'Did Péter run home?'); and these are marked stress patterns. With the unmarked stress pattern, namely sentence stress on the final constituent, Deletion cannot have taken place:

(10) *John ran home, and Peter walked.

(taken as meaning that Peter walked home.)

It was shown in Chapter 2 that Stress Placement in English serves the same function, from a discourse-structural point of view, as Extrapo-
position in Turkish. That is, it places the stressed constituent "in Focus" and all following constituents "out of Focus", i.e., treats them as presupposed (cf. discussion in Chapter 2). We have seen that Deletion and Extraposition in Turkish interact crucially in certain ways, and that Focus-Placement and Deletion also interact crucially. Recall an earlier example from Turkish, the gloss of which was

(11) *Nehmet COOKED the egg, and Ahmet COOKED the eggplant.

This is ungrammatical for the same reason as the Turkish sentence of which it is a gloss, namely you can't get contrastive Focus on identical verbs while defocusing different objects. (11) is possible, as noted in Chapter 2, footnote 8, as a correction of a preceding assertion of identical form that Nehmet and Ahmet did something else to the egg and the eggplant respectively; such corrections, however, have nothing to do with the internal structure of the "corrected" chunk of discourse.

The gapped version of (11) is also ungrammatical:

(12) *Nehmet COOKED the egg, and Ahmet the eggplant.

and by the same argument that led to the conclusion that Extraposition precedes Deletion, we can conclude that English Focus-Placement precedes Deletion. We might then hypothesize that Deletion is constrained not to delete a final constituent unless it is postfocal.

This interaction of Focus with Deletion, however, cannot account for the sentences (1)-(6). For no variation in stress placement can make (2) and (4) grammatical, nor make (6) a paraphrase of (5).

Note also that direct objects, sentential and infinitival complements, manner adverbs, and indirect objects of verbs cannot be deleted anyway, whether they are final or not:

(13) *John wrote the proposal on Wednesday, and we took to the dean on Friday.

(14) *John swore that he was a pervert on Wednesday, and denied on Friday.

(15) *We hoped to elect John spitoon cleaner, and our leader intended to appoint vice-treasurer.

(16) *John offered Charley some good advice, and Martha gave a black eye.

(17) *John ran clumsily up the stairs, and Peter walked over to the window.

(13) and (14) might be explained by ordering Deletion before the Extraposition rule which optionally places time adverbs in final position. Then a final-position restriction as proposed in Chapter 1 would prevent the deletion; and this would work for (15) as well, if the underlying order were 'elect --- spitoon cleaner --- John' and a similar extraposition rule (obligatory in this case) placed 'spitoon cleaner' in final position after Deletion had applied. For

(18) We hoped to elect John spitoon cleaner, and our leader intended to appoint Albert.

is all right with Focus as indicated. However, (16) is not explainable
in this way, for neither the direct object nor the indirect object is deletable, and it doesn’t matter whether the indirect object is converted to a to/for propositional phrase or not:

(19) *John offered Charley some good advice, and Martha gave Harry.

(20) *John offered some good advice to Charley, and Martha gave to Harry.

(21) *John offered some good advice to Charley, and Martha gave a black eye.

(22) *John made a cake for Charley, and Martha bought a bottle of wine.

(Note that (22) cannot be intended to mean that she bought it for Charley.)

Clearly there must be some constraint on Deletion to prevent the deletion of direct objects and indirect objects in any position; for no matter which order they occur in at the time of application of Deletion, one will not be in final position.

In fact, an NP (or PP) cannot, in general, ever be deleted from the second of two conjoined sentences, except with marked Focus preceding it, as in (7)-(9) (when they must have reduced stress, which is probably prerequisite to Deletion; cf. Chapter 2, Footnote 8); and the class of constituents that are deletable under even those circumstances is highly restricted. Note that while a locative expression (of time or place) is generally deletable when defocussed (as in (9)), a dative (or ablative) of motion is deletable (as in (7) and (8)) only with intransitive verbs of motion, not with transitives; observe:

(23) Albert carried the nitroglycerin into the kitchen, and threw the eggplant.

where you have no idea where Albert threw that eggplant. Or

(24) Albert broke the vase with a hammer, and pounded Murray’s brains out.

where again you have no idea what Albert used to pound Murray’s brains out with.

It appears that considerable refinement of the proposed restriction on Deletion is necessary in order to account for these facts.

In this section I will consider several ways in which the CD rule might be restricted, and suggest two very general kinds of constraints, one language particular and one universal, which can be proposed to account for the restriction on CD observed in English and other languages.

In the following two sections, I will consider in detail the nature of such constraints, and the empirical and theoretical consequences of postulating such constraints.

3.1.2 There appear to be at least two kinds of restrictions on the CD rule. Consider the case of sentences like (23) and (24). It seems that the unambiguity of these sentences might be accounted for by a general constraint on recoverability of deletions. Note that ‘Albert threw the eggplant’ is perfectly well-formed, and consequently if (23) could result from Deletion it would be impossible to tell whether Deletion had never taken place or whether the second clause had never had the missing con-
In order to formulate such a condition on Deletion, however, it is necessary to extend the notion of "recoverability" in a radical way, so that a deletion is considered "unrecoverable" if it is impossible to distinguish between zero deletion and deletion of what the first clause has that the second clause hasn't. Section 3 of this Chapter will be devoted to an explicit formulation of such an extension.

In this section I will be concerned with why English has constraints prohibiting deletions which are recoverable, such as the deletion of the direct object of a transitive verb, or the indirect object of a verb like 'give' which requires one.

These facts might be accounted for by positing for English a set of input conditions on the Coordinate Deletion rule; these input conditions must be language-particular, since some of them hold for English, but not for other languages, so that the universal formulation of the CD rule must be supplemented by language-particular conditions on the rule.

In the discussion to follow I propose to show that certain significant generalizations about English are obscured by such a treatment; and that significant generalizations about the correlation of deletion phenomena in particular languages with other features of those languages cannot be made as long as Deletion is constrained by conditions on the application of the Deletion rule itself.

3.1.2 In this subsection I will consider some of the difficulties with the formulation of the CD rule. Consider for example English Gapping (since this section is primarily concerned with English, I use the term Gapping to refer to CD which does not result in a reduced structure.) It has been observed that this rule cannot simply delete the verb alone. Jackendoff (1971) and Ross (1967a) observe that identical auxiliaries are deleted along with the verb, as well as any identical adverbs in preverbal position; and that in the presence of unlike auxiliaries or preverbal adverbs in the conjoined clauses, Gapping cannot occur.

It should be noted that the verbs must have identical tense as well, even though for some verbs the distinction of tense is neutralized on the surface: 'The Tuarans cut off the tails of their cattle, and the Muronians the testicles of their prisoners' is ambiguous, but only two ways; the deleted cut has to be the same tense as the remaining one. Without deletion, the sentence is four-ways ambiguous. The ambiguity can be selectionally resolved, as when 'present-day inhabitants of Transylvania' is substitute for 'Tuarans' and 'Hittites' for 'Muronians'. Note that Gapping then results in anomaly since the Hittites can't be doing any cutting in the present. This indicates that Gapping might precede the rule which attaches tense to the following finite verb and spells out the surface form. This ordering would automatically account for the reduced ambiguity of such sentences when gapped (and the anomaly of Gapping where the full sentences unambiguously have non-identical tense), since Gapping cannot apply when there are unlike auxiliaries, which would be the case as long as tense was still part of the AUX.
Let us refer to these restrictions as the like-AUX restriction and the like-adverb restriction. As I pointed out in the last section, there is a similar restriction on indirect objects: like indirect objects are obligatorily deleted along with like verbs, and unlike indirect objects prohibit Gapping. Thus there is a like-indirect object restriction on Gapping, similar to the like-AUX and like-adverb restrictions.

There is a slightly different kind of restriction with regard to direct objects:

(25) *John plays tennis with Sally, and Harry tennis with Susan.

It appears that identical direct objects, like identical AUX's, adverbs, and indirect objects, undergo obligatory Deletion along with the verb.

There is nothing wrong with

(26) John ate the rice, and Harry ate the rice.

nor with (27), which results from (26) after Deletion-Reduction:

(27) John and Harry ate the rice.

But (28) is no good:

(28) *John ate the rice, and Harry the rice.

Deletion is not obligatory; but if the verb is deleted, the like object has to go too.

Direct objects differ from indirect objects, adverbs and AUX's in that unlike objects do not prevent Gapping; thus we cannot speak of a like-direct object restriction in the same sense as the like-indirect object and like-adverb restrictions. However, it is clear that the Gapping rule must be formulated so that: (a) it fails to apply in the presence of unlike indirect objects, AUX's, or preverbal adverbs, and (b) deletes not only the verb, but also indirect objects, preverbal adverbs, AUX's, and like direct objects.

If these facts are to be accounted for by a particular verb-Gapping rule, it is clear that this rule has to refer to a chunk of stuff, which must be deleted in toto or else none of it may be deleted:

\[ \overline{V} = (\text{AUX}) (\text{ADV}) V \; (\text{Ind. Obj.)} \]

I use the symbol \( \overline{V} \) for convenience, as a shortened form for the string (AUX) (ADV) V (Ind. Obj.) The Gapping rule can let this chunk (\( \overline{V} \)) be deleted under conditions of identity with the same chunk in a preceding conjoined sentence. Jackendoff (1971) proposed informally just such a statement of the Gapping rule. But the rule still cannot apply freely, because if there are like direct objects as well, they must also be deleted if \( \overline{V} \) is deleted. And this object-Deletion cannot occur by itself either, but only when \( \overline{V} \) is deleted.

Consider the consequences of these facts for the formulation of the Gapping rule: if we want one rule to delete \( \overline{V} \), it is impossible to write this rule with a single Structure Index and a single Structural Change; it must have, in fact, two (disjoint) Structure Indices, each requiring a different Structural Change:
(29) \( NP_1 \overline{V} \; NP_3 \; Y_1 \) and \( NP_2 \overline{V} \; NP_3 \; Y_2 \rightarrow \\
NP_1 \overline{V} \; NP_3 \; Y_1 \) and \( NP_2 \; Y_2 \)

(30) \( NP_1 \overline{V} \; Y_1 \) and \( NP_2 \overline{V}_1 \; Y_2 \rightarrow \\
NP_1 \overline{V}_1 \; Y_1 \) and \( NP_2 \; Y_2 \)

with the condition that \( Y_1 \) and \( Y_2 \) in (30) not contain identical objects.

Clearly there is no sense in which this is one rule. And as long as it is two rules anyway, we could try to get out of having to state the condition that \( Y_1 \) and \( Y_2 \) in (30) not contain identical objects (which, from the point of view of weakening linguistic theory, is a very costly condition) by ordering (30) after (29); but then, since (29) is optional, (30) would have to be allowed to apply only if the structural index of (29) were not met; and this is the same condition.

3.1.3 So far we have considered \( \overline{V} \) to include \( \text{AUX} \) \( \text{ADV} \) \( \text{V} \) \( \text{Ind. Obj.} \), because of the like-AUX, like-ADV, and like-indirect object restrictions on Gapping. There is a similar restriction on the second of two "double accusatives": Jackendoff (1971) notes that such NP's can gap, if identical, along with the verb:


But NB that this is possible only with advanced Focus, i.e., with marked Focus on some constituent preceding the deleted NP.

He also noted that if both NP's are unlike, Gapping cannot occur:

(32) *Arizona elected Goldwater Senator, and Massachusetts, McCormack, Congressman.

What he failed to notice is that the non-identity of the second NP alone prohibits Gapping:

(33) *The Odd Fellows elected Tom Treasurer, and the soccer team, Captain.

That this prohibition is correlated with the grammatical function of the final constituent is clear from the grammaticality of such sentences as

(34) The Odd Fellows ejected Tom \( (a) \) last week, \( (b) \) roughly, \( (c) \) because he was a pervert, and the soccer team \( (a) \) this morning, \( (b) \) gently, \( (c) \) on account of his B.O.

Sentences like these, incidentally, make it difficult to maintain the claim, advanced by Jackendoff (1971) that Gapping occurs only when there is exactly one unlike constituent in the VP.

(35) The Odd Fellows ejected Tom roughly last week because he was a pervert, and the soccer team gently this morning on account of his B.O.
Note that in (34), any combination of the adverbial modifiers other than a-a, b-b, c-c results in an ill-formed sentence:

(35) The Odd Fellows erected Tom last week, and the soccer team
     on account of his B.O.

(36) The Odd Fellows erected Tom because he was a pervert, and
     the soccer team gently.

It was noted in § 1.1 that Gapping requires structural identity; it appears that this requirement must be strengthened in some way, so that it also requires, in sentences like (34), adverbs of the same “type”, i.e., both adverbs of time, or of manner, or of cause, etc. This is one of the aspects of the notion of “parallel construction” which needs to be reconstructed in order to explicitly account for syntactic deletion; however I have no suggestions as to how it could be done.

There must be some reason why Gapping is prohibited in sentences like (33) and (32). For the moment, let us assume that the “role” NP in such constructions is part of V, since it behaves exactly like AUX, ADV, and Ind. OBJ. with respect to Gapping.

Note that sentential and infinitival VP complements, on the other hand, behave like objects: if identical to corresponding constituents in the preceding clause, they must gap if the verb does, but if unlike, they do not prohibit Gapping:

(38) Albert proved that pi is irrational by induction, and Aubergine
     by a reductio ad absurdum.

(39) Bill expects Harry to find the way to the party, and Sue to
     find the way home.

(40) Alvin eats a lot to gain weight, and Murray to impress his
     mother.

So that a further restriction has to be placed on the variables $Y_1$ and $Y_2$ in (30) that they not contain like sentential or infinitival complements.

In general, it seems, if $V$ is deleted, then everything identical must be deleted along with it. If $V$ is not deletable, no deletion may take place at all, except under the special circumstances noted above where certain constituents may be deleted from certain constructions only with advanced Focus.

It is clear that it would be preferable if we could replace this mess with the general rule in Chapter 1 which allowed unrestricted deletion of identical constituents from left to right in structurally identical coordinate structures, together with a suitable and well-motivated constraint that would prevent the deletion, in English, of direct or indirect objects, or infinitival or sentential complements — in short, of NP’s out of VP, unless the verb is also deleted.

3.1.4 It has been suggested by Perlmutter (1968) that for various reasons a class of surface structure constraints or output conditions must be available as one of the devices used by grammars to delimit the class of grammatical sentences. One such constraint is that a sentence in surface structure in English must have an overt subject; i.e., that
the constraint (41) be added to the grammar of English:

(41) No non-imperative sentence in surface structure which does
not have a subject is well-formed.

Note that we cannot simply restrict Deletion, e.g., by means of a
constraint to the effect of (42):

(42) No subject may be deleted.

Because (a) we would require exactly the same restriction on the Question transformation to prevent questioning a subject (WH-Preposing) out of an embedded sentence. i.e., the Surface Subject Constraint is more general: it captures a generalization about English surface structure which would not be captured by constraints on individual rules.

(b) Deletion may delete a subject, as long as a reduced structure results by the reduction convention. Thus even if we did not have the output constraint (41) on the entire grammar, this restriction on Deletion would have to be stated as an output constraint rather than an input constraint on the Deletion rule.

It should be noted that this conclusion is forced by the formulation chosen for CD in Chapter 1, and justified there. Since the Deletion is supposed to occur independently of the reduction, which is an automatic restructuring convention, and since the deletion of a constituent will in some cases result in a reduced structure, but not in others, any constraint on the Deletion-Reduction process must be stated in such a way that it refers to the output P-Marker rather than the input P-Marker. The statement of such an output constraint on a particular rule is prohibited in the Standard Theory, which allows particular rules to be constrained only by input conditions and general (hopefully universal) output conditions.¹

In the following section I will attempt to show that the constraints on Capping can be stated in terms of output conditions that are independently needed to account for constraints on other deletion rules. I will then propose a general output constraint on the class of deletion rules of English, and argue that the most unrestricted formulation of the CD rule is in fact the correct formulation of that rule in the grammar of English.

3.2 The Deletion Constraint

3.2.0 It has been shown that some constraint must be placed on CD so that no NP may be deleted from VP unless the verb is also deleted. The immediate problem is how to state this constraint; the next, and far more important, question is how to account for it. For it is not the case that Deletion in languages in general is so constrained.

In this section I will show that the statement of the constraint on Deletion as a constraint on the application of the Deletion rule or on the output of the rule is empirically inadequate, in that in either case the constraint is almost always violated.
case a generalization is missed; and that there is a general constraint on deletion rules in English, which must be stated as an output constraint on the class of deletion rules, or else on the whole grammar, which accounts for these facts.

3.2.1 In Ross's original account of Capping (1967a), he formulated it as a rule restricted to the deletion of verbs (together with AUX and preverbal adverbs). Jackendoff (1971), however, noted that the same rule could delete NP's in the VP along with the verb under certain circumstances. Examples of such deletions were given in the preceding section.

It is clear that the Capping rule, whether or not it is collapsed with the CR rule into a single CD rule, as I propose, cannot be formulated simply to delete the verb, or the segment which I called \( \bar{V} \) in the last section.

But if, as I suggest, Capping is just an instance of the general CD rule, how can we account for the fact that, in English, direct objects, and other NP's in VP, can never be deleted in a gapped sentence unless \( \bar{V} \) is also deleted? One way was considered above: to place a condition on Deletion to the effect that whenever \( \bar{V} \) is deleted, all other identical major constituents must be deleted, and if any major constituent other than \( \bar{V} \) is deleted, then \( \bar{V} \) must also be deleted. Or, alternatively, that the entry condition for Deletion is identical \( \bar{V} \)'s, but the structural effect is to delete all identical constituents. It was also seen that this restriction, weird as it is, is still inadequate, since it still allows ungrammatical gappings.

Consider another deletion rule, the rule of Stripping. This rule, like the rule of Sluicing proposed by Ross (1965b), generally deletes everything from a sentence except for one constituent; it is a kind of counterpart to Ross's rule. Stripping converts the underlying sentence (1) into any of the sentences of (2):

(1) Harvey tried to persuade the anaconda to give Harry a chance to fight for his life.

(2) a. Harvey.
   b. the anaconda.
   c. Harry.
   d. his life.

It does this (optionally) anytime the sentence (2) is immediately preceded in discourse by one of the corresponding sentences of (3):

(3) a. Who tried to persuade the anaconda to give Harry a chance to fight for his life?
   b. What did Harvey try to persuade to give Harry a chance to fight for his life?
   c. Who did Harvey try to persuade the anaconda to give a chance to fight for his life?
   d. What did Harvey try to persuade the anaconda to give Harry a chance to fight for?

An argument that the sentences of (2) are derived by a deletion rule from (1) can be constructed along the lines of Ross's argument for the rule of Sluicing. I will not give it here. I have argued in
is necessary to allow transformational rules to be sensitive to context across sentence boundaries.

Note that the rule of Stripping is controlled by the presence of a WH-item in the preceding sentence. The constituent corresponding to the WH-item is exactly what remains of the stripped sentence after Stripping.

This rule also produces answers to questions like

(4) a. What did Harry do to the eggplant?
   b. What did Harry do with the eggplant?
   c. What did Harry do about the eggplant?

By deletion from the sentences of (5), (Pronominalization having previously applied), we get the corresponding sentences of (6), which are answers to the corresponding sentences of (4):

(5) a. Harry boiled the eggplant.
   b. Harry threw the eggplant into the kitchen.
   c. Harry wrote a letter to his Congressman.

(6) a. Boiled it.
   b. Threw it into the kitchen.
   c. Wrote a letter to his Congressman.

Note that the phrase 'to/with/about the eggplant,' has nothing to do with the deletion which occurs here; it (if it has to/with) expresses a presupposition about the form of the reply, so that certain replies could be anomalous on account of not conforming to the presupposition, e.g., if (6e) were offered as an answer to (4a). But this phrase doesn't affect the deletion one way or another. If it is not there, 'eggplant' in the (5) sentences cannot be pronominalized to 'it'; otherwise nothing changes:

(7) a. What did Harry do?
   b. Boiled the eggplant.

As above, Stripping deletes from the 'reply' everything except the queried element. But English has no device for querying a verb alone; we can only query the VP. Consequently the stripped reply is always a VP, never just a verb, except where the VP consists of only a verb:

(8) a. What did Harry do?
   b. Painted.

Note also that for the same reason, AUX never appears in such stripped sentences, since there is no WH-that includes AUX in its scope:

(9) a. What will/might/can/should Harry do?
   b. Feed the eggplant to the anacondas.

(10) a. What does Harry do?
    b. *will/might/can/should feed the eggplant to the anacondas.

These facts correlate with the fact that English has pro-forms for NP's and for VP, but not for AUX and not for V. And it has WH-items,
which are special pro-forms, for exactly those constituents for which it has ordinary pro-forms.

A consequence of this is that this rule can delete the object of a transitive verb (and any other element of the VP) only if the verb is also deleted. The rule of Gepping has exactly the same effect: any time the verb remains, its direct object (and all other NP's strictly subcategorized by the verb) must remain as well. What this amounts to is that the only way to delete an object is to delete the VP (possibly leaving behind a single constituent, but never the verb).

There is another rule like Stripping. (Or perhaps another environment where Stripping applies, but since the environments are quite different, I will call it a different rule and refer to the rule as Wrong). It produces corrective answers like the (12) sentences to statements or questions like (11) by stripping from full sentences everything but the corrected stuff.

(11) a. Harvey ate the eggplant this morning.
   b. Did Harvey eat the eggplant this morning?
   c. Didn't

(12) a. Harry.
   b. The old moldy breadfruit that has been lying in the refrigerator for six weeks.
   c. At noon.

But this rule too, which seems to have nothing to do with Pronominalization, never leaves a transitive verb stripped of its object (nor any verb stripped of any NP for which it is strictly subcategorized):

(13) a. Did Albert mop the floor?
   b. *Swept.
   c. Swept it.

(14) a. Did Albert give Sylvia the eggplant?
   b. *Gave.
   c. *Gave her.
   d. ?Gave her it.
   e. Gave it.
   f. Gave it to her.

(14d) is funny because of some constraint on pronouns in English; (e) is good because lend is not strictly subcategorized for an indirect object. Consider:

(15) a. Did Albert lend Sapphire the eggplant?
   b. *Gave.
   c. *Gave her.
   d. ?Gave her it.
   e. *Gave it.
   f. Gave it to her.

where, because give is strictly subcategorized for indirect object, (e) is ungrammatical.

Note that as with Stripping, the only way you can get an isolated verb stripped out is from a sentence the verb of which is not strictly subcategorized for any NP:
(16) a. Albert drove to Albuquerque.
    b. Flew.

Some people only get these with a preceding negative: 'No, flew'.

The interesting thing about this rule is that it has the same restriction on its output as the Stripping rule, but unlike Stripping it is not controlled by a WH- in the preceding sentence. How do we explain that Wrong cannot delete NP's strictly subcategorized by a verb, while leaving the verb?

Is it just an accident that these three rules never result in a sentence containing a verb without its strictly subcategorized direct object? In other words, could the grammar of English contain a rule which produces sentences in which the verb remains but its object has been deleted?

There are rules which remove objects from embedded sentences, e.g.,

WH- Preposing:

(17) Which eggplant did Harry say Max fed to the anacondas?

so that there are embedded sentences with transitive verbs which lack objects. But there is no topmost sentence in English containing a transitive verb which does not also contain an overt direct object.

(By 'transitive verb' I mean a verb which is transitive in the sentence in question, e.g., which actually has a specified object in some deeper representation of the sentence. The so-called 'deletable-object' verbs, when they are used without specified object and thus undergo 'object Deletion' do not count as transitive verbs, under this definition. Rather, they are intransitive. It is of course no matter what they are called; a distinction must be drawn between whatever process allows them to appear objectless in surface structures when they refer to no particular object or class of objects, and any process that would delete objects from shallow structures under conditions of identity with an earlier NP. It is clear that the former process, if it is Deletion at all, takes place at a much deeper level than the deletion phenomena with which I am presently concerned.)

I propose that the grammar of English must contain a constraint to the effect that no direct object of a transitive verb in a non-embedded sentence may be deleted, by any deletion rule.

Without such a constraint, three separate constraints to the same effect will have to be placed on the three deletion rules discussed in this section; and nowhere in the grammar will the generalization be stated that no transitive verb ever appears in surface structure in a topmost sentence without an overt direct object.

I will expand this argument in detail.

3.2.3 A more general statement of this claim is that every topmost sentence of English which contains a verb also contains all the complements for which that verb is strictly subcategorized (though they may have been moved around by movement rules). If this claim is true, there are only two ways to account for it: either

(18) the several deletion transformations which operate in topmost sentences in English happen by chance to be so restricted in
their application that they do not delete complements out of VP; or

(19) There is an output constraint on each rule that no application of it result in a sentence containing a verb but lacking a complement for which the verb is strictly subcategorized.

Note that if the latter is the case, since it is exactly the same condition that applies in each case, the output constraint is clearly a general constraint on deletion transformations, and need not be stated independently for each rule. Thus we can replace (19) by (20):

(20) There is an output constraint on the transformational component to the effect that any sentence containing a verb must contain overtly all of the complements for which it is strictly subcategorized.

This can be stated as an output constraint on the whole transformational component, rather than just on the deletion rules because only deletion rules can remove elements from topmost sentences; raising and movement rules can remove elements from lower sentences (and some lowering rules have been proposed which remove elements from higher sentences: but these higher sentences always get deleted afterward); but no movement rule can move an element out of a topmost sentence, since there is no place to put it except somewhere else in the same sentence.

To accept hypothesis (18) would be to assume that both Wrong and Gapping have extremely complex conditions on their application to the effect that whenever the condition allowing the verb to be deleted is not present, no VP-complement can be deleted either and that these conditions have no common explanation.

Suppose however that we assume (18) and posit restriction (21) for Gapping:

(21) VP-complements may be deleted only if verbs are deleted.

But consideration of (22) reveals that restriction (21) is incorrect:

(22) John cooked and ate the rice.

Presuming that the arguments given above, that sentences like (22) result from Deletion and subsequent Reduction, are correct, it is apparent that Deletion cannot be restricted as stated in (21); for here an object has been deleted, but the verb has not.

Must we modify (21) to say that if the subject is also deleted, then like objects can be deleted, even when \( \bar{v} \) is not deleted?

Note that the effect of this new modification will be to allow Deletion exactly in those cases where Deletion will result in reduced structures; except that Deletion is still allowed when \( \bar{v} \) is deleted, as before. Thus, as before, the effect of the constraint is that no Deletion may result in a (topmost) \( S \) which lacks a complement strictly subcategorized by the verb.

We can avoid having to state such complicated extra restrictions only by adopting hypothesis (20); at the same time we assert that there is a connection between the fact that Gapping produces no sentences with
verbs lacking complements for which they are subcategorized and the fact that Stripping produces no such sentences, and the fact that Wrong doesn't either. We assert that no rule of English can produce sentences like that. Since in fact no sentences like that occur in English, adoption of this constraint as a part of the grammar of English captures a generalization about English that is otherwise uncapturable.

I therefore propose that the constraint (20) be added to the grammar of English, and that the rules of Gapping, Stripping, and Wrong, (and in fact deletion rules in general) be written without the restrictions on their application that would otherwise be necessary.

3.2.9 It is now possible to account for some of the unexplained properties of Gapping in English.

First and incidentally, the ungrammaticality of

(45) *Dolores gave incriminating evidence about Harry to the FBI, and Frank sent to his mother-in-law.

which Jackendoff (1971) offers as evidence that Gapping is not an extension of CR. results from the failure of this sentence to meet the Deletion Constraint which requires that a verb like send, strictly subcategorized for a direct object, have a direct object in surface structure. Since the Deletion Constraint is a particular feature of the grammar of English, we do not expect in general that such gapping of direct objects is prohibited, and in fact it is not: it can occur, for example, in Turkish and Japanese.

Also incidentally, there are some apparent counterexamples to the Deletion Constraint, for example the verb tell:

(46) John told Bill that Sally was pregnant, and Albert told Esau, But tell can occur without its sentential complement in general:

(47) Albert told Esau.

whereas swear, say, and deny cannot:
(46) *Albert denied to Essau.

Without trying to determine whether 'Essau' in (46) and (47) is an indirect object in both cases, whether it gets reinterpreted as a direct object in (47), or whether these questions make any sense at all, it is clear that tell, unlike swear and say, is not strictly subcategorized for the sentential object. This automatically accounts for the fact that Gapping can occur as in (46), but not with swear, as in

(50) *John swore to Bill that Sally was pregnant, and Albert swore to Essau.

NB also that tell with a NP-complement is strictly subcategorized:

(51) *John told Bill a story, and Albert told Essau.

A simple extension of the Deletion Constraint might also account for the like-AUX restriction. There is good evidence (cf. Ross 1957c) that the so-called "auxiliary" verbs are simply verbs which are strictly subcategorized to occur in VP's with ordinary lexical verbs as "complements". Whether or not this view is accepted, it is clear that the like-AUX restriction can be viewed as a special case of the Deletion Constraint, if that constraint is simply extended in an obvious way. We need only specify that in English no verb (or verb-like element, if AUX's are maintained not to be verbs) may appear in a topmost sentence unaccompanied by the full complement of its strictly subcategorized complements. Then the deletion of a verb without concomitant deletion of the AUX would violate the constraint.

There remains the other half of the like-AUX restriction, namely that like-AUX's must be deleted along with the verb, if the verb is deleted. This, however, follows from the formulation of Gapping as a case of CD. For the CD rule, although optional, deletes all identical major constituents from the following clause. It is a blanket rule, and cannot selectively delete some like constituents, while leaving others behind.

Whether this same explanation can be extended to the like-ADV restriction, I do not know. It is probably significant that the like-ADV restriction seems to apply only to preverbal adverbs, i.e., adverbs which occur in surface order between AUX and V. Perhaps this gives them some special structural status, e.g., perhaps they are cliticized in some way to the verb, so that verbs with unlike preverbal adverbs, even if the verbs are identical, are non-identical for the purposes of the Deletion rule.

In the next section, I will take up certain other unexplained restrictions on Gapping, and show that they can be accounted for by another general restriction, this time a universal constraint on deletion.

3.3 The No-Ambiguity Condition

3.3.0 In this section I will consider another kind of constraint on the Deletion rule, one which raises theoretical questions of considerable importance.

Several of the cases of impermissible gappings cited at the beginning of this chapter cannot be accounted for by the Deletion Constraint developed
in the last section. Many of these involve deletions that would leave
more than one element of the VP of the second sentence, as in

(1) *John gave Susan an eggplant, and Henry Marthe a potato sandwich.
which is even worse with common NP's in place of the proper names:

(2) *My uncle gave the bartender a dirty look, and the old woman
sitting on the barstool in the corner the young man standing
next to her sipping an orange soda a punch in the mouth.

Jackendoff (1971) suggests that more than one remaining constituent
in the predicate reduces acceptability, and this is a reasonable assum-
tion. Gapped structures are essentially contrastive, that is, the consti-
tuents that remain after Gapping are each contrastively opposed to their
 corresponding constituents in the left conjunct. This means that the con-
joined structures qualifying as input to the Gapping rule must have con-
trastive FOCUS on the unlike constituents, i.e., the constituents that
are to remain after Gapping. It also means that there is a processing job
that has to be done by the interpreter of these gapped sentences: he has
to associate each remaining constituent with the parallel constituent in
the first clause, with which it is in contrast. If two constituents re-
main in the VP, this means three matchings, since the subjects have to get
matched too.

If this explanation is accepted, and if "reduced acceptability" is
to be taken as different from ungrammaticality, perhaps sentences like
(1) and (2) are to be considered grammatical but unacceptable.

Some other kind of restriction seems to be operating in sentences
like (3)-(6):

(3) *Sam gave Sally the eggplant and Harvey, Susan.
(4) Sam gave Sally the eggplant and Harvey the breadfruit.
(5) *I want Bob to shave himself, and Mary to wash himself.
(6) Bill is depending on Harry to find the way to the party, and
Susan to find the way home.

Sentence (6) ought to be ambiguous, with one interpretation being '...
and Bill is depending on Susan...' and the other being 'and Susan is de-
pending on Harry...'; but the latter interpretation does not occur, so
Gapping has not occurred. Rather CD has applied, but only one of two
possible deletions occurs.

My contention is that to be able to generate these sentences we would
have to violate one of the universal constraints on deletion: that all
deletions are recoverable. Note that in each of these sentences
((3)-(6)), there are two possible deletions: one of which results in Gap-
ing, which is rejected in each case, and one which results in reduction.
The latter interpretation is ruled out on selectional grounds in (3) and
(5), but not in (4) and (6), where it is taken unambiguously as the only
possible one.

That this is so in the case of (5) as well as (4) can be readily
demonstrated by substituting Harvey for Mary, which immediately produces
a grammatical, but unambiguously reduced sentence.

Clearly some kind of derivational selection is going on here. Why
can we get the deletion that results in reduction, but not the one that results in Gapping?

If the grammar allowed us to get both derivations, there would be no way (except accidentally, as in (3) and (5), because of selectional restrictions) to tell afterward which deletion had occurred. So if we accept the proposition that there is a general constraint on recoverability of deletion and if we take it literally, it cannot be surprising that something is blocked. But perhaps it should be surprising that we have to take it so literally; the constraint was originally proposed to block deletions that would allow an infinite number of different recoveries. Here it seems that deletion is blocked even when its nonrecoverability is of the lowest order. There seems to be no a priori reason why deletion should not be able to produce such a limited ambiguity as this one.

Yet this seems to be exactly the constraint that is operating here. Of course, we could try to block the disallowed gappings, as Jackendoff does, by various conditions on the application of Gapping; but it would take two distinct conditions to account for these cases (sentences (3)-(6)) alone. And these are not the only ones:

(7) Max seemed to be trying to convince Ted to depart, and Walt, Iris.
(8) *Max wanted Ted to try to convince the anacondas to depart, and Walt, Iris.
(9) Max seemed to be trying to convince Ted to depart, and Harvey to stay with the anacondas.

Jackendoff suggests a condition on Gapping to the effect that if the VP contains an NP VP sequence of any kind, only the NP can remain. This will account for (7) as well as for (9). But it will not account for (8). The only way to account for (8) in terms of input conditions on Gapping is to require that it not apply if there are two NP's among the infinitives in such sentences as these.

3.3.1 I propose to account for these blocked gappings another way.

(10) The No-Ambiguity Constraint

Any derivation resulting in a gapped structure which is identical in surface form to a structure derivable by some other derivation is blocked.

This is a boldly transderivational constraint; transderivational constraints are powerful devices, and who knows whether we ought to let them in the door. As noted above, positing a universal constraint is by definition grammar-constraining and strengthens linguistic theory, no matter whether the particular device required to state the constraint has ever been used before or not.

If this constraint is added to linguistic theory, the formulation of gapping rules in the grammars of particular languages can be constrained in a way that is impossible without this constraint. In fact, if the empirical claim implicit in this constraint is correct, every language will require just the same input constraints on its Gapping rule that English would require, if the constraint is not available.

It is strange that if the reduction convention is automatic, as I have claimed, it is impossible to even get a gapped structure for some
of these sentences.

Consider the two possible derivations of

(11) Max forced Ted to leave, and Walt to stay.

Suppose the structure at the time the Deletion rule applies is that of

(12) Max forced Ted to leave, and Max forced Walt to stay.
(13)

Deletion of 'Max forced' from the right conjunct leaves [Walt stay] VP
hanging which then automatically gets Chomsky-adjoined to the correspond-
ing VP in the left conjunct, resulting in the reduced structure (14):

(14)

Now suppose the structure at the time of Deletion is that of (15):

(15) Max forced Ted to leave, and Walt forced Ted to stay.
(16)

Deletion of 'force Ted' from the right conjunct results, after S-Pruning,
in the structure (17) on the right:

(17)

which, since it is dominated by VP, then gets Chomsky-adjoined to the VP
in the left conjunct:

(18)
which is identical to the structure (14) arrived at by the other derivation.

It would be nice if it always worked out this way, but it doesn't:

for things like

(19) Sam gave Sally the eggplant and Harvey the breadfruit.

a gapped structure does result from the application of Deletion to a presumed underlying structure corresponding to

(20) Sam gave Sally the eggplant and Harvey gave Sally the breadfruit.

(21)

So if the structure has to remain like this, the phrase 'identical in surface form' in constraint (10) cannot refer to the surface 'structure' as it is generally understood. It must refer to the 'flat structure' that remains after all structure above the major constituent node labels has been stripped away; i.e., to the surface order of constituents and their grammatical categories.

But if, as suggested by Kuroda (in an unpublished paper which I have not seen) we adopt another pruning convention,7 to the effect that any node-label be erased whenever the head of the construction under it is deleted (there are obviously a lot of difficulties with this, e.g., the notion 'head' is not adequately defined in transformational theory) the structure (22) will get further reduced to (23):

(22)

Note that we do not want to allow $S_2$ in this diagram to reduce to NP by virtue of the fact that it dominates only NP nodes; for this is precisely the structure we would always get after Gapping, and gapped structures are clearly not NP's, but S's. So we must formulate the S-reduction convention so that an S gets reduced to an X-node only if it dominates conjoined X-nodes, which these are not.
Now consider the two possible derivations of

(8) *Max wanted Ted to convince the anaconda to depart and Walt, Ira.

The underlying structure is:

(86)

with either the upper or the lower set of NP's in the right conjunct.

With the upper set of NP's, Deletion and Pruning lead to (27):

(27)

and with the lower set, it leads to exactly the same thing. So either of the derivations leads to a gapped structure that can be got by another derivation and both are rejected.

If Kuwada's suggestion about Node-Pruning is accepted, this again reduces to (28):

(28)

Since there are two ways to get this structure, both derivations involving Gapping, both derivations are rejected.

The most astounding thing about this constraint on Gapping is the fact that, even where Deletion is actually recoverable, as when the competing derivation can be rejected entirely on selectional grounds, the derivation with Gapping still blocks. This is clearly not merely a performance constraint, for if it were, we would expect selectional disambiguation to render the gapped structure acceptable; and it doesn't. The constraint is sensitive only to the structure of the output, not to any selectional or semantic information.

Note that the proposed constraint correctly predicts the ungrammaticality of any gapping which leaves just two NP's on the right when there is an NP NP sequence in the VP of the left conjunct. This
includes sentences like (19) as well as sentences like (29):

(29) John calls Harry Mike and Sam Harry.

Gapped sentences with NP PP sequences left hanging are also blocked by this constraint, if there is an NP PP sequence in the VP on the left.

(32) Max put the eggplant on the table and Harvey in the sink.

There is a class of apparent counterexamples to the constraint (10):

(37) Massachusetts elected McCormack Congressman, and Pennsylvania, Schweiker.

If Congressman is an NP, the grammaticality of the gapped sentence constitutes counter-evidence to (10). However, it is very doubtful that Congressman is an NP in such a sentence. Note that the 'role' NP in such a construction like this is very limited in internal structure. It can never have a determiner, for example:

(38) *Massachusetts elected McCormack {the governor.} {a Congressman.}

It also can never be modified by a restrictive relative clause nor a non-restrictive relative clause with who or that:

(39) France elected DeGaulle President, *who has a big nose.

*who runs the country.

*that rules France with an iron hand.

*who has an office in Paris.

*who I can't stand.

It can be modified by a non-restrictive relative clause with which:

(40) France elected DeGaulle President, which is no sinecure.

This NP is also restricted selectionally to a fairly small class of lexical items; not every NP qualifies:

(41) *We elected an octopus.

In fact, the list of NP's that do not cause ungrammaticality in this position is minute: president, dogcatcher, secretary-of-state, sergeant-at-arms, etc. And the class of verbs that occurs in such constructions is likewise minute: appoint, elect, etc.

There is no transformational evidence that I know of that these are NP's. They don't passivize:

(42) *President was elected DeGaulle by France.

They don't topicalize:

(43) *President, we elected Nixon.

They don't cleft:

(44) *President is what we elected Nixon.
They don't relativize, either restrictively, or nonrestrictively:

(45) *President, \( \{ \text{which?} \} \) we elected Nixon, is no sinecure.
\( \{ \text{who?} \} \)

And they don't pronominalize:

(46) *We elected Tom President, and the chess club elected him
\( \{ \text{it} \} \) too.
\( \{ \text{one} \} \)
\( \{ \text{theirs} \} \)

There is further evidence of another kind that 'role' NP's are not NP's: Ross notes (1967b § 3.1.1.3.) that there is a general constraint on the rule of Complex NP Shift which prevents a complex NP from being shifted over another NP, as in *(47)*:

(47)*I loaned my binoculars a man who was watching the race.

But he also notes that 'role' NP’s do not count as NP’s, as far as this constraint is concerned:

(48) We elected President my father, who had just turned 60.

In the face of this evidence, I don't see how the claim could be maintained that Congressman in (37) is an NP.

The fact that they only get relative clauses with which, where the relative clause expresses some judgment, appropriate to a state, like 'no sinecure', 'a pain in the ass', etc., follows from the fact that this is exactly the only kind of relative which can modify a sentence.

(49) She is tall, which is a pain in the ass.
(50) She is tall, which I find very attractive.

This assumption likewise explains why Gapping is all right in such sentences as (37): the structure hanging on the right after Gapping is

(51)

\[
\begin{array}{c}
S \\
NP \\
\end{array}
\quad
\begin{array}{c}
NP \\
\end{array}
\]

and there is no NP NP sequence on the left:

(52)

\[
\begin{array}{c}
S \\
NP \\
\end{array}
\quad
\begin{array}{c}
V \\
NP \\
\end{array}
\quad
\begin{array}{c}
? \\
\end{array}
\]

So the Gapping is all right.

In German, sentences corresponding to "France elected DeGaulle President" have, instead of a "double NP", an NP PP construction:
(53) Frankreich erwählte DeGaulle zum Präsidenten.
France elected DeGaulle to President
"France elected DeGaulle President."

If the gapping in English is all right because 'congressmen' is not an NP in sentences like (37), it should, for the same reason, be all right in German, for 'zum Präsidenten' is clearly a PP (which this entire analysis presupposes to be distinct from NP; this means either there is a distinct node label for PP or the matching convention is sensitive to the presence of the preposition); so that the NP NP sequences remaining after Gapping should not match the NP PP sequence in the predicate of the right conjunct, and ambiguity can only be avoided by blocking Gapping. Indeed the sentence

(54) Frankreich erwählte DeGaulle zum Präsidenten, und DeutschlandErhardt.

is good. But as in English, if the 'roles' are unlike, Gapping blocks:

(55) *Frankreich erwählte DeGaulle zum Präsidenten und Deutschland zum Kaiser.

which is exactly required by the No-Ambiguity Constraint (10).

In this subsection I have shown that the No-Ambiguity constraint can account for a considerable number of the previously unexplained restrictions on Gapping. It should be clear that this way of blocking the impossible gappings is empirically superior to the several constraints on the application of the Deletion rule which would otherwise be necessary.

Such conditions (e.g., the condition proposed by Jackendoff that Gapping be prohibited from applying to delete an NP from the VP of a sentence containing an NP VP sequence in its VP) do not explain anything; they merely describe what happens. The proposed constraint explains why a sentence containing an NP VP sequence in its VP cannot be gapped to delete the NP. It asserts that there is a relation between this condition and the otherwise apparently unrelated condition on gapping an NP out of an NP NP sequence in a VP.

In short, the individual and unrelated conditions that would have to be placed on Deletion in order to prevent the impossible gappings cannot have the explanatory power of the No-Ambiguity Constraint. No set of conditions on the input to the Deletion rule could account for the cases where Gapping must be blocked in a way that captures the generalization that is expressed directly by this constraint.

Consequently, if the empirical predictions of the No-Ambiguity Constraint are validated, as I claim they are, the correctness of the constraint is demonstrated and it must be added to linguistic theory.

In the following subsection I will discuss the significance of this proposal for linguistic theory.

3.3.2 In the introduction to this thesis, I noted that the notion of recoverability was in need of more precise formulation.

The results of the preceding subsection suggest a reformulation of the recoverability condition, which can be stated as follows:
(56) A deletion is recoverable if, given only the output and the
statement of the rule which effected the deletion, the under-
lying structure immediately prior to application of the rule
can be uniquely determined.

This is equivalent to saying that in order to meet the recoverability
condition, deletion rules must be one-to-one mappings between classes of
P-Markers. The constraint would be violated by any application of a de-
letion rule which could, applying to distinct inputs, produce the
same output. Thus 'blanket' rules like CD are nonvacuously subject
to the constraint.

This is a strong condition, and if empirically correct, which my
investigations so far have shown it to be, its incorporation into liningu-
tic theory is indicated. No empirically correct universal constraint
can be excluded from linguistic theory on the grounds that it requires
a new formal device to formulate it. Such a constraint not only constrains
the notion "possible grammar of a natural language", but does so in a cost-
free way, since no version of this constraint need ever be stated in the
grammar of any particular language.

There has, however, been considerable verbal expression of dismay
at the suggestion that linguistic theory should allow the formulation
of constraints which require "transderivational" power, i.e., which must
refer to information present in two or more different derivations; there-
fore the theoretical implications of this proposal merit some discussion.

The most common objection to a transderivational constraint such as
(57) is that it appears to require the grammar (or the generating device,
or the native speaker using the grammar, etc.) to search through the
infinite class of derivations before deciding whether the rule appli-
cation involved is allowed by the constraint or not. Since this search,
particularly in the case of a generally formulated constraint like (56),
would apparently be endless, it seems that the notion of finiteness of
grammatical devices has been discarded.

However, in the particular case of constraint (56) no such endless
search is called for. The constraint refers necessarily to other deriva-
tions, but only to other derivations involving application of the same
Deletion rule to produce the same output. This class of derivations is
finite. Thus the objection on grounds of non-finiteness of process is
inapplicable.

This suggests, however, that there may be a very powerful way to con-
strain the constraints: it seems reasonable to propose, as a general re-
striction on transderivational constraints, that the statement of such
a constraint must specify, implicitly or explicitly, a finite well-defined
class of derivations to which it refers.

There is another possible restriction, which is a very important one
from the point of view of linguistic theory: that transderivational con-
straints exist only as general conditions on certain classes of rules,
and never appear in the grammars of particular languages. If this is
so, and I know of no evidence that requires or even suggests the formu-
lation of a language-particular transderivational constraint, the adoption
of a universal constraint like (56) has no possibility whatever of wea-
kening linguistic theory.
It should be emphasized that the adoption of (56) itself has no such implications, independently of whether transderivational constraints are contemplated in the grammars of particular languages, because (56) is not a language-particular constraint.

3.4 Conclusion

In this chapter I have discussed two kinds of constraints on the CD rule. The Deletion Constraint was shown to be a general output constraint on deletion rules in a particular language. The No-Ambiguity Constraint suggested in the last section is nothing other than a strong form of the recoverability condition.

It should be noted that other recent work has turned up evidence of just such a strong condition on recoverability in quite unrelated areas. Judith Aissen (personal communication) reports the following situation in Attic Greek:

(a) There is a Sequence-of-Tense rule in indirect discourse, which optionally converts an underlying subjunctive or indicative verb embedded under a verb of saying which is in a past tense, or in the optative (which apparently counts as a past tense) to the optative.

(b) However, the reading of such an optative corresponding to an underlying indicative is possible only where, for other reasons, the underlying form could not be subjunctive; in other words, in cases where ambiguity could arise as a result of application of the Sequence-of-tense rule, its application is blocked for indicatives. An underlying indicative which, by its conversion to optative would become indistinguishable on the surface from a possible underlying subjunctive in general remains in the indicative.

David Perlmutter, in recent work on Slovenian, has discovered a similar constraint on a movement transformation. There is a clitic movement rule which moves clitics from indefinitely far down in embedded sentences up to second position in the matrix sentence. Under certain conditions, as the rule is most generally formulated, it is possible that the result of different applications of the rule to two different underlying structures, a single output would result. In other words, it would be impossible to tell from where exactly the clitic came, after the clitic movement rule had applied. In such cases, neither derivation is allowed. The resulting sentence is not ambiguous, as would be expected; rather it is unacceptable.

Perlmutter suggests that this judgment of "unacceptability" is actually a heretofore unnoticed kind of ungrammaticality. The same sort of judgment seems to be operating in all of these cases (at least those for which judgments can be got from live speakers): sentences like *(3.3.8) are certainly worse than ambiguous; but the most consistent judgment seems to be "uninterpretable". The distinction between this kind of unacceptability and ordinary ungrammaticality, if real, is a purely intuitional one. Yet if it is real, i.e., if it is judged that this intuition is one that needs to be accounted for in linguistic theory, there is an automatic way to do it. The particular judgment of "unacceptable" or
"uninterpretable" that is encountered in the case of sentences like *(3.3.6) is exactly what arises from a violation of a recoverability condition.

The examples just given as evidence of such conditions raise two important theoretical questions.

The first is the question of how in individual cases the recoverability condition is to be assured of being met. From the evidence cited, it appears that there are different conditions in the case of different rules.

The Deletion rule is blocked, according to the No-Ambiguity constraint, when a structure with a gap can be produced via two different derivations; and only derivations producing gaps are blocked. Thus in (3.3.9) there are two possible derivations, both by Deletion; but one results in a reduced structure, and one has a gap. Only the gapped reading is blocked, so that (3.3.9) is grammatical but unambiguous. Thus in this case recoverability is assured by a constraint that, in cases of potential ambiguity derivations resulting in gapped structures are blocked.

In the case of the Attic Sequence-of-Tense rule, an optional rule is blocked in cases of potential ambiguity; but it is blocked for one of the potential derivations only, that from an underlying indicative. These conditions indicate that in at least some particular cases, either linguistic theory or the grammar of a particular language must assign priority to one of the competing derivations; so that in cases of conflict it is predictable, given the knowledge of this assignment priority, which derivation has been blocked.

I have assumed (without providing any evidence from other languages) that the assignment of priority to derivations resulting in reduced structures in the case of the CD rule is, like the recoverability condition, universal. If so, the formulation of such a condition constitutes a powerful addition to linguistic theory, and allows rules of particular grammars to be stated without many complicated and unilluminating conditions. If the recoverability condition is universal, but the particular means of assuring recoverability are not, then its addition to linguistic theory is still indicated, although it would be less strong, because then particular grammars would have to be allowed devices for stating such particular formulations of the condition as the No-Ambiguity Constraint.

The second important theoretical question raised by these examples is one of range of application of the recoverability condition. Some version of such a constraint appears to be operative not only in the case of deletion transformations, but also in the case of at least some movement transformations and some "feature-changing" transformations. However, such a constraint apparently does not hold for all syntactic rules.

In other words, if such a constraint were generally operative, we would expect there to be no cases of ambiguity in syntax. Yet there clearly are such cases. It seems, in fact, that some cases of ambiguity are acceptable, while others are not. The job before us is to determine exactly which potential ambiguities are never allowed to arise in natural language; in other words, which rules are subject to no-ambiguity constraints.

We must be able to specify, in terms of the formal properties of a rule, exactly what universal conditions it is subject to. In the following chapter, I will undertake an examination of the formal properties of deletion rules. At the close of that chapter, I will propose a generalization about the class of transformations which obey recoverability.
The empirical investigation which led to the postulation of the Deletion Constraint and the No-Ambiguity Constraint was a consideration of the limitations on one rule, the rule of Coordinate Deletion. It was shown that a set of complex input constraints on CD could be replaced by these general constraints, and that this choice was dictated in one case by considerations of generality of grammatical statements and in the other by universal considerations of recoverability.

These results are crucial for the hypothesis that CD and Gapping are the same rule, for without them, it would be impossible to collapse the two rules. If compelling reasons were found to reject either of the two proposed constraints, the Gapping-Deletion hypothesis of the first chapter must also be given up. Since this hypothesis has empirical support, and since universal predictions made on the basis of this hypothesis seem to be borne out, this constitutes additional evidence for the proposed constraints.

This is an important point. A rule which at first glance seemed to be subject to several ad hoc conditions turns out upon more thorough investigation to be subject to no conditions at all, except for general language-particular output conditions and universal constraints. My conclusion is that the CD rule can be universally formulated as deletion under structural identity of identical items from a following conjoined structure; and that this rule is subject to no language-particular conditions on its application at all.

This is a strong claim, for it places a significant constraint on the grammar of every natural language. It must contain the CD rule, in the universal formulation, and it may not incorporate any conditions on this rule, other than general constraints holding for all the rules of a given class, or on the output of the transformational component.

I want to emphasize the empirical nature of this hypothesis. Although I state it in terms of the transformational framework, even of a particular formulation of that framework, the generalizations expressed in the universal claims of this and the preceding chapters do not stand or fall with the framework in which they are stated.

This claim says, in plain English, that every language has conjunction-reduction: i.e., in every language there are sentences containing conjoined constituents which are synonymous with and related to (i.e., exhibit regular grammatical relations with) conjoined sentences identical except for those constituents; and that, unless a language has a general condition on the presence of particular constituents, such as the peculiarity of Japanese that every topmost sentence have a verb, it is also the case that it will have conjoined sentences with constituents missing from the non-leftmost one(s), and such sentences will be interpreted as if the missing constituents were identical to the corresponding constituents in the leftmost conjunct. It further says that, except for such general conditions, which express regularities of the grammatical relations between sentences, every conjunction of sentences containing identical constituents will be matched by either a sentence containing a conjunction of constituents or by a conjunction of sentences with a constituent missing from the non-leftmost conjunct(s), but never by both.

The empirical nature of these claims is such that counterevidence should be easy to find if they are incorrect. For this reason, in spite of the fact that the investigation which led to their postulation is ad-
mittedly restricted to a few languages and a few phenomena in those languages, I feel justified in proposing their acceptance as postulates of linguistic theory.

Footnotes to Chapter 3


6. A transderivational constraint is a constraint on a derivation which must be stated in terms of an entirely different derivation. I know of no published work of transderivational constraints, although this device has been proposed orally by several people, principally G.

Lakoff; D. Perlmutter has found evidence for very similar constraints on deletion and movement transformations in Slovenian.

7. In Chapter 4, I will suggest a slightly different convention for the pruning of nodes other than S, which will have the same effect.

8. The information for Attic Greek is based on Goodwin (1889).

9. This work is as yet unpublished, but was presented in a course at MIT in Spring 1971.
Letter Footnotes - Chapter Three

a. (p.232) But it seems that the only ones that are really good with more than two constituents remaining in the gapped conjunct are those where, as in (35), we have an NP constituent paired up with a set of roughly parallel adverbial constituents, which may perhaps be interpreted as a conjunction.

b. (p.235) The reader should ignore this, as it makes sense only if (a) one accepts the "surface subject constraint" and (b) one further accepts the pruning proposal which has been deleted from chapter four.

c. (p.244) What I was struggling with in this and the following sections was the fact that Gapping (and other ellipsis rules) cannot delete the complements of verbs in English, leaving the verb behind. A general prohibition against deleting verb complements, however, cannot be imposed, because they can be deleted in such constructions as comparative and relative clauses, by the rules specific to those constructions; and by various Equi-like deletion rules in certain adjectival and adverbial complement constructions.

Since the allowable deletions of verb complements are all by rules that go down into embedded clauses (where the controller of the deletion is in a matrix clause) I was led into the error of thinking of the verb-complement deletion constraint as a constraint sensitive to the difference between embedded and "topmost" (roughly = Emonds' "root") clauses. This was wrong, because Gapping, for example, can apply in conjunctions which are embedded; and such downstairs Gappings are just as sensitive to the constraint on complement deletion as in non-embedded conjunctions. Furthermore Comparative Ellipsis, which applies in comparative clauses and consequently only in embedded context, is subject to the same sort of constraint.

The necessary distinction is not between "topmost" versus embedded clauses, but between two classes of deletion rules. The rules which need constraining are the "ellipsis" rules (called "structure-identity" rules in this thesis) which delete variables in specified domains. The rules which can delete verb complements are "target" rules, which delete a specified target constituent in a particular kind of complement structure. Cf. Chapter four (section 4.4).

d. (p.245) The formulation of this condition as an "output constraint" was entirely wrong-headed. Cf. footnote c.

e. (p.274) I don't know why I said this, since it hardly seems plausible that "reduction" has taken place in (6), or that it would in the selectionally impossible readings of (3) and (5).

f. (p.276) This proposal is developed more fully (and more ambitiously) in Hankamer (1973).

g. (p.278) The hell it does. This case should be exactly like (22), discussed immediately below, in all relevant respects.
CHAPTER FOUR

Formal Properties of Deletion Rules

4.0 In the preceding chapters the properties of one rule, the rule of CD, have been investigated in detail. In this chapter it will be shown that these properties are shared by a class of deletion rules which have certain formal characteristics, the class of structural-identity (SI) rules.

Other classes of deletion rules will be distinguished, and it will be shown that there are correlations between formal characteristics of the statements of these rules and other formal properties, such as boundedness and sensitivity to island constraints.

There are several different types of deletion rules, which can be distinguished in terms of properties of the statement of the rule.

The primary distinction to be recognized is between rules which delete a constituent under "identity" (a precise characterization of this term will be proposed below) with another constituent in the linguistic structure, i.e., rules of the form

(1) a. \[ X A Y B Z \rightarrow X A Y Z \]
   b. \[ X A Y B Z \rightarrow X Y B Z \]

   Condition: \( A = B \)

and rules which effect deletion without reference to an identical constituent elsewhere in the linguistic structure:

(2) \[ X A Y \rightarrow X Y \]

where the segments represented by \( X, Y, \) and \( Z \) in these schemata may or may not be variables, and there may or may not be other conditions on the input or output structures, or on the variables in these rules.

I will refer to rules of type (1) as identity deletion rules, and to rules of type (2) as drop rules. Most of the subsequent discussion will be restricted to identity deletion (ID) rules.

The class of ID rules can be further subclassified. Some ID rules delete in specific structures, so that \( Y \) in (1) is not a variable, but a constant, a representation of a proper analysis of a specific class of structures. An example of such a rule is Equi-NP Deletion, to such rules as close deletion rules.

Other ID rules must be formulated with a variable between the deleted constituent and its "antecedent".

In the following section I will establish a distinction between two types of distant deletion rules: the class of pronominalization rules and the class of wipe-out rules. These two types of rules will be shown to have different properties.

Finally it is necessary to distinguish the class of deletion rules which, like CD, have a structural identity requirement on the whole structure in which deletion takes place. As was noted in § 1.1.1, the rule of CD cannot simply be formulated with a variable: it requires a much stronger formal device in its statement, since the rule cannot apply to delete constituents from a right conjunct, unless that conjunct is structurally identical to a linear constituent with the left conjunct.
The rule of CD is also unusual in that it deletes not a constituent specified in the structural index of the rule, but any (major) constituent identical to the corresponding constituent in the left conjunct. Such rules will be referred to as Blanket rules or Structural Identity (SI) rules.

In this chapter, I will investigate some of the formal properties of these different types of rules. I will show that the class of Blanket rules has special properties different from other deletion rules, such as the property of boundedness. I will also propose a characterization of the class of Pronominalization rules, and show that this class of rules also has characteristic properties. Finally I will propose some generalizations relating formal properties of rules to their sensitivity to island constraints and Recoverability conditions.

4.1 Identity

4.1.0 Clearly, the characterization of various types of deletion rules given in the introductory section presupposes a universal definition of linguistic identity. An adequate characterization of this important notion, however, has never been formulated. In this section I will discuss various kinds of "identity" which are required for the formulation of various deletion rules, and propose a universal generalization relating formal properties of deletion rules to the identity condition required for each type of rule.

The discussion of recoverability in the last chapter led to the formulation of a Recoverability condition on CD which would prevent any case of ambiguity from arising directly from an application of that rule. The No-Ambiguity condition developed there assured that this Recoverability condition would be met by rejecting any derivation resulting in a gapped structure that was indistinguishable from an ungapped one, and furthermore rejecting both derivations if two applications of CD to two different underlying structures result in the same gapped structure.

4.1.1 The Recoverability Requirement

In the preceding chapter it has been shown that the Recoverability condition on deletion in syntax must be formulated in a particularly strong way in order to account for the restrictions on Gapping; the No-Ambiguity requirement proposed there is nothing other than a particular realization of the Recoverability condition.

The structural identity condition on CD rules also has the effect of assuring recoverability. It seems not unlikely that an adequate characterization of the notion "recoverability" would include these two conditions as special cases, and make their separate statement in linguistic theory unnecessary.

Let us consider what formal properties a deletion rule must have in order to be recoverable. In general terms, a deletion is recoverable if, after the deletion has occurred, there remains enough 'information' in the remaining structure so that given this information and the rule which effected the deletion, it is possible to specify the deleted constituent(s).

A particularly strong way of formalizing this is to say that the mapping defined between classes of F-Markers by a deletion rule must be reversible, i.e., it must be one-to-one. This would mean that the application of a deletion rule could never result in ambiguity.
formulation is too strong for at least some deletion rules is clear from the fact that some rules involving deletion, namely pronominalization rules, can result in ambiguity:

(1) Marvin gave Harry a picture of himself.
(2) Marvin gave Harry a picture of his mother.
(3) John wants Harvey to buy a present for his mother.
(4) John asked Harvey to try to persuade Muggsy to buy him a present.
(5) Someone who can, should teach me how to wiggle my ears.

Yet we have seen that ID rules such as CD have exactly this requirement. So it appears that deletion rules of different formal types have different identity requirements.

This also means that the Recoverability condition cannot have a universal formulation applicable to all deletion rules, unless these variations can be accounted for some other way. It appears that "recoverability" must be defined relative to the type of rule effecting deletion.

Chomsky (1965) suggests that there are basically two ways in which a deletion rule can assure recoverability:

(a) it can delete a specific item unconditionally, or it can delete a specific item in a specified structural relation. This is the case in the rule of that-deletion. The deletion is recoverable because the rule deletes only the particular item that and only from a specified position in structure, namely from the leftmost branch of an embedded S. Thus the output of the rule, together with the rule itself, suffices to define the input P-Marker.

(b) it can delete a constituent under "identity" with some other specified constituent. This is the case, for example, with Equi-NP Deletion. This deletion is recoverable because the rule together with the output P-Marker which contains the antecedent NP suffices to determine the input P-Marker.

These two ways of assuring recoverability would serve to divide deletion rules into two classes. Rules of type (a), which mention in the structural index of the rule the particular item to be deleted, will not concern us further. Given the necessity for the SI condition on CD and the No-Ambiguity condition developed in Chapter 3, it is no longer possible to assume, as Chomsky (1965) does, that there are no other types of deletion rules than those which can assure recoverability in one of these two ways.

For the rule of CD, which is a Blanket deletion rule, neither mentions in its structural index a specific item to be deleted, nor deletes an item under identity with another item specified in the structural index of the rule. Thus we must add another class of recoverable deletion rules:

(c) a deletion rule can assure recoverability by satisfying a structural identity condition (and, in certain cases) some form of the No-Ambiguity condition.

It became clear from examination of the properties of CD in the last chapter that a rule formulated like CD, as a Blanket rule, cannot assure recoverability unless its SI requirement is supplemented by some kind of No-Ambiguity condition. In § 4.4 I will discuss several such rules, and show that they all have properties in common with CD; although the
A similar rule exists in many languages. However, in every case that I know of, there is a parallel rule of pronominalization that, under conditions the nature of which is not entirely clear, does have a pro-form in place of the deleted constituent:

(8) Hasan bir salatalık buldu, onu Ayşeye verdi.

"Hasan found a cucumber, (and) gave it to Ayşe."

The "conditions" for such pronominalization appear to be stateable only in terms of such notions as emphasis, disambiguation, and contrast; the introduction of such predicates into the entry conditions of transformations would require an extension of grammatical theory, which we cannot go into here.

The point is that the conditions for pronominalization, other than the special ones involving emphasis of some sort, are exactly the same as those for "NP-Deletion". One of the conditions (there may be others) is the existence of a coreferent NP in preceding discourse. (As indicated above, the question whether there is backward Pronominalization into subordinate clauses is not clearly resolved; but this lack of resolution exists on the same grounds, which we cannot go into here, in both Pronominalization and NP-Deletion.) It is also the case that when the conditions allowing the pronoun to appear obtain, the Deletion rule must be blocked, for Deletion would be anomalous under those circumstances. These facts can be automatically accounted for if Pronominalization precedes Deletion, and Deletion deletes not full NP's, but pronouns, exactly when the conditions of emphasis do not obtain.

There is another reason for doing it this way: first and second person
pronouns, which must be generated in the base and clearly are not inserted by any pronominalization rule, also appear only under the same conditions of emphasis. Thus if NP-Deletion and pronominalization are separate, independent rules, we need a third rule just to delete first and second person pronouns (after the rule of subject-verb Agreement, since verbs agree with subjects in person and number) when conditions of emphasis do not obtain, i.e., exactly where the pronominalization rule must be blocked. But if there is a general pronominalization which inserts a pro-form whenever the general conditions for pronominalization obtain, and a subsequent general pronoun-deletion rule which deletes all pronouns when the conditions of emphasis do not obtain, these facts are accounted for automatically; and what is most convincing about this analysis is that the facts are accounted for by two completely general rules, whereas otherwise we are forced to postulate three rules, each of which requires an extra condition.

So far as I know, a similar argument would lead us, in every other language which has an NP-Deletion rule, to formulate pronominalization generally as here, and let a pronoun-deletion rule delete the pronoun under whatever conditions allow full deletion.

Another consideration which would lead us to consider the proposed formulation correct is that only if we can account for the facts of NP-deletion in languages like Turkish in this fashion will it be possible to formulate pronominalization as a rule of universal grammar, for which it is one of the most likely candidates. Thus to adopt the alternate solution in the case of Turkish would involve not merely an unnecessary complication of the grammar of Turkish, but would also stand in the way of a universal formulation of the pronominalization rule in its most general shape, and thus would contribute to the perpetuation of a considerable and unnecessary weakness in linguistic theory.

There is implicit in the conclusion just drawn an empirical claim, which if disproved would destroy the entire argument to follow: namely that in every language which has an NP-Deletion rule like that of Turkish, there is also a pronominalization rule with exactly the same scope as the Deletion rule, except that the pronouns only appear under special "extra" circumstances; so that a solution like that outlined for Turkish is always possible.

The formal status of such rules, however, remains somewhat obscure. It will be seen below that pronoun-deletion rules constitute an exception to, or at least raise problems for, an otherwise universal generalization about recoverability conditions on deletion rules. Final verification or rejection of many of the generalizations proposed in this chapter will depend on an adequate understanding of rules of this type, which cannot be provided at present.

These rules do not delete under identity, nor do they refer to a particular item, but rather to a class of items, namely the class of pronouns. Such rules clearly cannot by themselves assure recoverability of deletion.

It seems likely that these rules achieve recoverability in some other way, but the situation is complex and I cannot go into a general account of rules of this type. I will only point out that whereas languages like Slovenian, which has a pronoun-deletion rule only for subject pronouns, are not uncommon, no known language has such a rule only for object pro-
nouns. In Turkish, which allows deletion for pronouns in accusative and oblique cases, as well, this option is exercised much more regularly in the case of subject pronouns. Third person object pronouns are generally deleted, but first and second person ones generally are not. The reason for this asymmetry is certainly related to the fact that subject-agreement is marked on the verb in these languages whereas object agreement is not.

An adequate theory of agreement phenomena (which has not been formulated), which accounted, among other things, for the fact that agreement features are the features that are to be found in personal pronouns might provide a basis for the formulation of an identity condition between pronouns and agreement features which would account for the "recoverability" of deleted pronouns in languages like these, or at least allow a precise statement of what "recoverability" amounts to in these cases.  

The Turkish pronoun-Deletion rule, for example, has several conditions which conspire to eliminate possibilities of ambiguity. Deleted subject pronouns are in fact recoverable from the agreement marking on the verb. In the third person, the verb is generally not marked for plural when the subject is non-human; but if the third person plural subject is deleted, the plural marker appears on the verb. This can only mean that the feature [plural] (or the actual plural marker) is placed on the verb by the Agreement rule, and is subsequently deleted only if the subject, with its plural marker, has not been deleted. (Alternatively, but nondistinguishably, it would be possible to say that the plural morpheme is transferred from the subject to the verb by the rule which deletes the subject.) Subject pronouns are at any rate fully recoverable when deleted.

Other pronouns are not recoverable from agreement features; however, there are other restrictions on the pronoun-Deletion rule which conspire to prevent deletions from resulting in ambiguity. In cases other than the nominative, only third person pronouns are regularly deleted. First and second person pronouns are deleted "except under conditions of emphasis or contrast", but "contrast" has to be taken in a very broad sense, for first and second person pronouns appear frequently without Focus or other overt sign of "emphatic" contrast. They seem to appear, in fact, whenever their deletion would not be recoverable from previous linguistic context.

It is quite possible that a thorough investigation would reveal that these pronouns are only deleted by other independently motivated deletion rules such as Stripping, which operates under conditions which assure recoverability, (Stripping will be discussed below); and that the pronoun-Deletion rule actually applies only to third person pronouns in cases other than the nominative. In order to seriously advance such a proposal, however, it would be necessary to argue that such verbs as vermek "to give" in Turkish are not strictly subcategorized for an obligatory indirect object, because such verbs occur without indirect objects in context where no linguistic antecedent could have controlled its deletion:

(9) Ahmetten beş lira isterdim. ...Verdi mi?  
from Ahmet 5  lira I asked (for) (did) he give? i.e., 'did he give it to you?'

unless we can formulate a rule which deletes the second person dative pronoun from the second sentence under referential identity with the first person nominative subject (overtly represented in the agreement affix on the verb) in the first sentence.
In view of the complexity of the situation, I can only throw up my hands. It is nonetheless the case that a diverse and apparently unrelated class of conditions conspire to prevent ambiguity from arising by application of the pronoun-Deletion rule, and I know of no cases where this rule can actually be applied in such a way as to result in ambiguity.

Whether this is due to the finiteness of my knowledge of Turkish, or to some kind of performance constraint like the one that causes people to avoid even syntactically permissible ambiguity, rather than a formal restriction like the No-Ambiguity constraint, is not clear.

4.1.3 It is with rules of type (b) that the discussion of this section will be concerned. I will refer to such rules as Identity-Deletion (ID) rules.

Some rules of this class, like Equi-NP Deletion, involve no variables; such rules delete under identity in a particular structure, and the recoverability condition is easily satisfied. Recoverability becomes problematic only in rules which delete over a variable or under structural identity.

In the following section a distinction will be made between pronominalization rules and other ID rules, which effect full deletion of a constituent and which I will call wipe-out rules. Both types, however, are rules of type (b); they effect deletion under identity with some other constituent. Both types of rules also effect deletion over a variable, and recoverability of deletion is thus not so easily assured as is the case with close deletion rules. Unless constraints are placed on the variable, on the application of the rule itself, or on its output, differing interpretations of the variable in the application of the rule to different P-Markers may result in the same output. We saw that precisely this effect was blocked by a perfectly general recoverability condition in the case of CD; and that this recoverability condition does not apply to pronominalization rules.

In this section I will consider several ID rules and show that they all obey a no-ambiguity condition. I will also discuss close deletion rules like Equi, and argue that these rules never violate the condition either. The generalization will then follow that a general No-Ambiguity condition, which is equivalent to the strong formulation of the recoverability condition, is a requirement on all deletion rules other than pronominalization rules (still possibly excepting pronoun-Deletion rules, which remain outside the present discussion).

Ross (1967b, § 4.1.4.) discusses the Japanese Relative Clause Formation rule. In Japanese, the embedded S in a relative clause structure precedes the head noun and the coreferent noun in the embedded S is simply deleted:

(10) kodomo ga sakane tabete iru.
    child    fish eating is 
    "The child is eating the fish."

(11) Sono sakane wa ookii.
    That fish big
    "That fish is big."

(12) Sono kodomo ga tabete iru sakane wa ookii.
    That child eating is fish big
    "That fish which the child is eating is big."

Ross shows that the rule which effects this deletion in relative clause structures is subject to the Complex NP Constraint (which prohibits deletion or movement of an element out of an embedded sentence dominated
by NP, where the NP also dominates a lexical head noun)\textsuperscript{3} and to some
condition reminiscent of the Crossover Condition:

(13) \textbf{The Crossover Condition}

No NP mentioned in the structural index of a transformation
may be reordered by that rule in such a way as to cross over
a coreferential NP. [Ross 1967b (4.30)]

This condition, as Ross states it, is a more general version of a
condition originally formulated by Postal (1968), to the effect that no
rule may interchange two coreferential NP's. Ross shows that Relativiza-
tion can apply to delete NP\textsubscript{1} in (14), but not NP\textsubscript{2}:

(14)

\[ \begin{array}{c}
S \\
NP \\
\mid \\
NP_{1} \\
\mid \\
N \\
The_1 \\
NP \\
\mid \\
NP \\
\mid \\
V \\
\end{array} \]

So that (15) is grammatical, but not *(16):

(15) \textit{hito\textsubscript{1} ga nagai to itte hito\textsubscript{1}}

\textit{he} \textit{tall} \textit{that said} \textit{man}

"The man who said he was tall"

(16) \textit{hito\textsubscript{1} ga nagai to itte hito\textsubscript{1}}

\textit{man} \textit{tall} \textit{that said} \textit{man}

"The man \textit{he} \textit{said was tall}"

And Ross concludes that some form of the Crossover Condition is operative
in blocking *(16). His conclusion from this is that the Japanese Relative
Clause rule must involve a movement of the relativized NP, since the Cross-
over Condition (and, he says at this point, the island constraints) applies
only to movement rules.

In \S 6.1.3., Ross retracts his claim that island constraints apply
only to movement rules, for there appear to be several rules which cannot
reasonably be supposed to incorporate a movement which do obey the constraints.
It may be that these rules (cf. \S 4.1 of this chapter) can be shown to
incorporate a movement, in which case some very powerful generalizations
about deletion rules will be possible; but at present we must consider
the evidence to indicate that at least some deletion rules (cf. also\S 4.2.)
do obey island constraints.

In this subsection I will argue that the phenomenon which Ross attrib-
utes to some form of the Crossover Condition is in fact due to a No-Ambi-
guity constraint on the Relative Clause rule in Japanese. In \S 4.5 I
will argue that the Crossover Condition is in fact a special case of the
No-Ambiguity condition, which applies not only to deletion rules but to
movement rules as well.
In order to interpret the inability of NP₂ in (14) to relativize as resulting from a Crossover Condition, Ross had to suggest, although he presented no formal restatement of the condition, that the term "crossover" would have to be reinterpreted to take into consideration not only the linear ordering of constituents, but also the hierarchical structure.

Thus in suggesting that the ungrammaticality of *(16) be accounted for in terms of a Crossover Condition, Ross is forced both to generalize the condition as proposed by Postal and to interpret "crossing over" in an entirely new sense. I propose here to reject the assumption that the ungrammaticality of *(16) must be accounted for in terms of a condition on movement rules, since there is no firm syntactic evidence that the Relative Clause rule in Japanese does incorporate any movement; and to develop a more general type of constraint which can account for both crossover phenomena and the blocking of deletion in sentences like *(16).

Note that the No-Ambiguity condition developed in Chapter 3 to account for restrictions on CD can also virtually without modification account for the ungrammaticality of *(16), if it is merely assumed that the Japanese Relative Clause rule is subject to that condition: the deletion NP₂ in (14) would leave a "gap", whereas the deletion of NP₁ would not.

I have no very firm opinion about the correct derived constituent structure for such gapped structures in Japanese: for one thing I doubt the existence of the nodes labelled VP in Ross's representation; so that I cannot maintain that the formulation of the No-Ambiguity condition in terms of surface structure rather than flat structure can be carried over for this purpose. But it is clear that all we need to do to block *(16) is to formulate a condition on the Japanese Relative Clause rule that rejects derivations resulting in a "gap" when a competing derivation results in the same output (in terms of flat structure, at least) without a gap. And this is the same condition that was needed for CD.

There is a way to test the correctness of this proposal. If the ungrammaticality of *(16) is due to a violation of No-Ambiguity condition, it should have nothing to do with coreference. And if a case could be found where both relativizations leave a gap, both should be blocked.

I don't know whether such an example can be found in Japanese. However the same phenomenon occurs in Turkish, which has a Relative Clause rule exactly like the Japanese one, except that the verb is also turned into a participle and the subject of the relative clause, if it is not the relativized constituent, goes into the genitive case.

(17) yılan Hasanı ısırdı.
the snake Hasan was biting
(acc.)
"the snake was biting Hasan"

(16) Ali yılanı öldürdü.
Ali the snake killed
"Ali killed the snake."

(19) Ali, Hasanı ısırdı yılanı öldürdü.
Ali Hasan biting snake killed
(acc.)
"Ali killed the snake which was biting Hasan."

(20) Hasan, yılanı ısırdı.
Hasan the snake was biting
"Hasan was biting the snake."

(21) Ali, Hasanın ısırdığı yılan öldürdü.
Ali Hasan-gén bitten snake killed
"Ali killed the snake that Hasan bit."
If the subject is relativized, the participle in the relative clause is formed with the suffix -an. Otherwise it is formed with the suffix -dik. (Both of these have various harmonic alternants, which are irrelevant for the present discussion.)

Just as in Japanese, if a sentence like (22) (realized as (23)) is embedded as a relative clause, only the subject NP is relativizable:

(22) adam₁ [adam₁ büyük] söyledi.
    man₁ [man₁ (is) big] said

(23) Adam (kendisinin) büyük olduğunu söyledi.
the man his (own) big being (he) said
"The man said that he was big."

so that (24) is grammatical, but not *(25):

(24) (kendisinin) büyük olduğunu söyledi adan.
    his (own) big being saying man
"The man who says he is big."

(25) *(adan₁) büyük olduğunu söyledi adan.
    (the man's) big being saying man
"*The man who he said was big."

Where it is clear in (24) that the relativized NP is the subject (the first adam₁ in (22)) because the subject participle in -an appears. *(25) shows that the other adam₁ cannot be relativized, since it would require a non-subject participle in -dik as in *(25), which is ungrammatical.

But if we try to embed (24) in a structure, we find that neither of the underlying adam₁ 's can be relativized:

(26) Mehmedin (adanın) büyük olduğunu söylemesinden bahsettği adam.
    Mehmet's (the man's) big being saying discussing man
"The man who Mehmet discussed the man's saying the man was big."

This is no good, whether or not the NP adanın is deleted by the pronoun-Deletion rule. If the ungrammaticality of *(25) were due, as Ross argues for a similar case in Japanese, to a violation of the Crossover Condition formulated as a constraint on movement rules, it would be impossible to explain why *(26) is ungrammatical, for if, as Ross claims, the more deeply embedded NP "crosses over" a less deeply embedded coreferent NP in Relativization, no matter which direction it moves, it must be equally true that the less deeply embedded NP does not "cross over" a more deeply embedded one in Relativization. Otherwise (15) would be blocked as well as *(16).

The Turkish examples show that a much more general constraint is at work, one which prevents relative clause formation rules, which, like those of Turkish and Japanese, simply delete the relativized constituent, from resulting in ambiguity; and it does so by rejecting any derivation which results in an ambiguous "gap."

I propose, then, that the No-Ambiguity constraint applies not only to the CD rule but also to the Japanese and Turkish Relative Clause rules.

There are other identity-deletion rules which must be formulated with variables, such as the rule of Comparative Deletion (cf. § 4.4). Most of these rules are so formulated that an application of the rule could not result in ambiguity; however, Comparative Deletion is so formulated:

(27) John is much taller than Bill claims Harry is.
The Comparative Deletion rule, which deletes a constituent (such as the adjective tall in (27)) from a comparative clause under identity with a constituent in the "matrix" clause, can also delete NP's, and from different places in the embedded clause:

(28) John knows more girls than know Harry.
(29) John knows more girls than Harry knows.

But because in English the subject and object are on opposite sides of the verb, these deletions are recoverable. But note that if the deleted NP is adjacent to another NP, as in

(30) John came with more girls than Harry gave invitations.

The resulting sentence is not too good. Note that, if the deleted NP comes out of a PP, the deletion is all right:

(31) John came with more girls than Harry gave invitations to.

And if there is a possible interpretation without deletion, it is preferred and the interpretation with deletion is impossible:

(32) John knows more girls than Harry writes letters.

which means, if anything, that the number of girls John knows is greater than the number of letters Harry writes.

These facts are accounted for automatically if the No-Ambiguity constraint applies to Comparative Deletion, for in (32) the deletion of girls from the comparative clause produces a sentence with a "gap" which is identical to a sentence without a gap; and the derivation producing the gap is rejected. In (30), the structural position of the gap is not determinable, even though there are strong selectional clues that could serve to disambiguate. Thus just as was found to be the case with CD, the condition operating in this case is only sensitive to structure, not to selectional features. The marginality of (30) may be attributable to the fact that (31), which is good, is not much different from (30).

I know of no other ID rules of English which are so formulated that they can produce potential ambiguity, except for pronominalization rules.

Rules such as Equi-NP Deletion, which produces (34) from an underlying (33):

(33) John wants [John go nuts].
(34) John wants to go nuts.

which are formulated without variables, cannot ever result in ambiguity. This rule, for example, refers specifically to the subject of the embedded sentence, and deletes it under identity with the subject or object of the matrix sentence. Whether the antecedent is subject or object in the matrix sentence is an idiosyncratic property of the verb, which must therefore also be mentioned in the rule.

So that such rules do not require the No-Ambiguity condition. Another way to look at it is that they invariably obey the No-Ambiguity condition by virtue of the fact that they never give rise to a situation where the No-Ambiguity condition would find anything to reject.

At this point it becomes necessary to ask whether there is any formal property common to these rules that is correlated with the applicability of this condition. We might hypothesize that:
(a) All deletion rules obey the No-Ambiguity condition.
(some of them, of course, obey it vacuously, since they are so formulated that they cannot ever produce ambiguous results). We have seen, however, that pronominalization rules do not, in general, obey any such constraint although they are deletion rules (i.e., whatever else they do, they involve deletion of constituents or parts of constituents under identity).

A possible weaker hypothesis is:

(b) All deletion rules, except pronominalization rules, obey the No-Ambiguity condition.

The first question is whether this is empirically correct; the second, which this generalization, even if correct, begs, is why should pronominalization rules be exempt from the No-Ambiguity condition? In other words, what formal properties set off pronominalization rules from other deletion rules, and how do these properties correlate with the ability or inability of a rule to produce ambiguity?

In the following sections I will discuss pronominalization rules and show that the only apparent contradiction to the generalization (b), the rule of VP-Deletion, can be reformulated in such a way that this and several other universal generalizations are exceptionless. In the final section I will take up the question which is begged by this statement, and propose a characterization of the class of rules which obey No-Ambiguity conditions.

4.1.4 Before going on to discuss the formal properties of pronominalization rules, however, it remains to consider one more aspect of linguistic identity.

Some deletion rules require that the deleted constituent, if an NP, be coreferent with its antecedent, if the antecedent is referential. This is true of Equi-NP deletion, Relativization in Turkish and Japanese, "definite" Pronominalization, and the deletion involved in Relativization in English. It is clear that C and has this requirement too, for

(35) Alvin cooked and ate the buffalo balls.

is not ambiguous as to whether there are one or two Alvins involved, or one or two sets of buffalo balls.

But at least one rule involving deletion does not have a coreference requirement, namely "indefinite" Pronominalization:

(36) John has a green sucker, and I want one too.

which is derived from

(37) John has a green sucker, and I want a green sucker too.

Although green sucker is certainly referential, coreference is not required for indefinite Pronominalization. If the NP's are coreferential, definite Pronominalization applies to yield

(38) John has a green sucker, and I want it.

I will argue, however, that it is not really necessary, at least not in English, to have two rules for indefinite (identity-of-sense) and
definite (identity-of-reference) Pronominalization. I assume that there is in the grammar of English a rule of Definitivization, which marks an NP as definite if there is a coreferent NP in preceding discourse:

(39) A man called. I took man's name and number.

is converted by this rule into

(40) A man called. I took the man's name and number.

In most transformational treatments the feature [definite] is a choice in the expansion of NP in the base. Arguments that this is at least in some cases incorrect are given in Dean (1966) and in Orešnik and Perlmutter (1972). In line with the general approach taken in this thesis to discourse phenomena, I assume that any adequate account of the discourse function of definiteness will require such a rule.

This rule will automatically mark as definite any NP which would be eligible for definite Pronominalization, e.g., the second instance of man in (38)-(39).

This being the case, I see no reason why the Pronominalization rule should have to refer to coreference at all; it can simply delete NP under identity, leaving behind the "determiner" or (equivalently) the "pronominal features". A spell-out rule such as those postulated in Postal (1959) can then turn the stranded determiner (or bundle of pro-features) into the appropriate pronoun, which will be one of the definite pronouns if the feature [definite] is in the bundle. Otherwise indefinite Pronominalization results.

Orešnik and Perlmutter (1972) observe that in Slovenian, there is no distinction between 'definite' and 'indefinite' Pronominalization:

(41) Stane je videl polavto, in Tone ga je videl tudi.
Stane saw blue car and Tone saw too.
"Stane saw a blue car, and Tone saw it too."
"Stane saw a blue car, and Tone saw one too."

[Orešnik and Perlmutter (1972)]

The fact that English has two Pronominalization rules, one for 'definite' and one for 'indefinite' Pronominalization, while Slovenian has only one, is unexplained.

But Slovenian also has no 'definite' article, so that (42) is ambiguous, or vague, as between the two English glosses:

(42) Stane je videl polavto.
Stane saw blue car
"Stane saw a blue car."
"Stane saw the blue car."

So that it seems unlikely that Slovenian has a Definitivization rule. But if this is the case, my hypothesis about Pronominalization would predict that there would be no distinction in Slovenian between definite and indefinite pronominalization.

If this proposal is accepted, it is possible to state the following tentative generalization:

(43) Pronominalization rules do not require coreference.
This must be too strong, however, for sentence Pronominalization, which is a pronominalization rule (cf. § 4.9) must require coreference of any NP's within the deleted sentence with corresponding NP's in the antecedent sentence:

(44) John_{j} says he_{j} beats his_{k} wife_{k}, but I don't believe it.

The deleted sentence (replaced by it in (52)) is unambiguously taken to be identical in all respects to the sentence embedded under say:

(45) ...but I don't believe he_{j} beats his_{k} wife_{k}.

And in (46), the NP his_{j} worry beads must be coreferent with a similar NP in the deleted complex NP which is pronominalized to him:

(46) John is looking for the scoundrel who swiped his worry beads, and I'm looking for him too.

for I must be looking for the scoundrel who swiped the same worry beads as John is looking for the scoundrel who swiped.

It seems that whether or not the NP undergoing pronominalization requires coreference with its antecedent, any NP's in sentences embedded under it do require coreference with the corresponding NP's in the antecedent. This is true even if the pronominalization is 'indefinite':

(47) John is looking for a scoundrel who said he would be willing to steal Harry's worry beads, and I'm looking for one too.

It has long been recognized that referential indices must be associated with NP nodes, and not with N's or any lower constituent in the NP.

I propose the following generalization, as a refinement of (43):

(48) Pronominalization requires identity, but not coreference, of the pronominalized constituent with its antecedent. Identity means structural identity, in the sense outlined in § 1.1: this includes identity of structure, identity of node labels, identity of lexical items, and coreference of all corresponding nodes below the node-label of the pronominalized constituent.

Thus in (49), which underlies (47):

(49) John is looking for a scoundrel who said he would be willing to steal Harry's worry beads, and I'm looking for a scoundrel who said he would be willing to steal Harry's worry beads too.

Pronominalization requires identity between the antecedent NP and the pronominalized NP. It does not require coreference, so John and I can be looking for different scoundrels. But it does require (by virtue of the definition of identity) coreference between the corresponding NP's in the sentences embedded under the scoundrels: they have to be willing to steal the same worry beads.

"Structural identity", as noted in § 1.1, actually requires far more than this; perhaps we should say absolute identity, for, as noted there, constituents deleted under a structural identity requirement cannot even differ in derivational history. I will not go into this question
here, but it involves important metatheoretical issues, not for the formulation of particular rules in particular grammars, but for the form of universal constraints. For the full specification of the absolute identity condition apparently requires devices far more powerful than any we would contemplate allowing to the grammars of particular languages.

There is one aspect of linguistic identity which appears to violate this "absoluteness", however. Ross (1967b), § 5.2.3.1., observes that under certain conditions, referential identity is not required:

(50) John beats his wife, and so does Harvey.

is ambiguous as to whose wife Harvey beats. Ross attempts to revise the definition of linguistic identity to take such cases into account, but he does not mention coreference, and his proposal is inadequate in any case. He proposes a universal characterization of "sloppy identity", under which pronouns are considered "identical" if they are commanded by their antecedents, and the antecedents are not subject to deletion. Thus in

(51) $\text{John}_i$ beats his$_i$ wife and $\text{Harvey}_j$ beats his$_j$ wife.

the pronouns his$_i$ and his$_j$ are identical under this characterization because they are commanded by their antecedents. That this characterization is inadequate is immediately clear if we consider a sentence in which the command relation holds, but the pronoun is in an embedded sentence below the sentence containing the antecedent.

(52) John beats his wife, and Harvey persuaded Jerome to do so too.

In (52) it can be that Jerome was persuaded to beat his own wife, or to beat John's wife; but not Harvey's wife. Yet by Ross's Sloppy Identity convention, (52) should be derivable from (53):

(53) John$_i$ beats his$_i$ wife, and Harvey$_j$ persuaded Jerome$_k$ to beat his$_j$ wife.

Another difficulty with Ross's proposal is that, as he points out, it cannot account for the unambiguity of

(54) The Poles kissed their wives, and so did the Latvians.

which cannot be taken to mean that the Latvians kissed the Poles' wives.

But in fact this is true only if (54) is taken as a generic statement, i.e., if it is static. Suppose at a party there are two Poles and three Latvians, and only the Poles have wives. Then it would not be ungrammatical to say (54), meaning the Latvians also kissed the Poles' wives. Note the clear ambiguity of (55):

(55) The Poles are kissing their wives, and so are the Latvians.

So whatever explanation we propose to account for the ambiguity of sentences like (50) must also account for the ambiguity of (54) in the case that their wives'is referential; but not when 'their wives' is not referential, i.e., when it contains an indefinite pronoun or an explicit or implicit quantifier.

I do not propose to formulate a replacement for Ross's Sloppy Identity convention; however, it appears that there is a correlation between the phenomenon of sloppy identity and something else: the domain of Reflexi-
visualization. So far as I can determine, it is the case that whenever there is the possibility of ambiguity of reference in sentences like (50) or (52), there are exactly two readings. One is coreferent with the corresponding NP in the antecedent structure, and the other is coreferent with an NP in the same simplex, i.e., with an NP which could control Reflexivization.

I suggest that linguistic identity allows two kinds of relations between a deleted NP and its corresponding NP in the antecedent structure. One is coreference, and the other is a reflexive relation to an NP in its own sentence, identical to that which the corresponding NP of the antecedent structure bears to an NP in its sentence.

The result of the preceding discussion, given acceptance of my pronominalization hypothesis, is that the only deletion rules which do not require coreference are pronominalization rules, which do not require coreference between the pronominalized NP and its antecedent, although all referential constituents under the pronominalized node are under an absolute identity condition. All other identity-deletion rules, and all structural identity rules, are subject to the absolute identity condition, including coreference. In this section I have discussed various types of identity-deletion rules, differing as to the recoverability condition which they meet and the identity requirement which they must incorporate into their statements. It has been shown that pronominalization rules are different from other identity-deletion rules in both respects.

In the following section I will examine pronominalization rules in detail, and propose a precise characterization of the notion "pronominalization rule". Here, however, as a preliminary notion, I will draw a distinction between two types of ID rules which correlates with the results of this section:

(56) A pronominalization rule is an ID rule which substitutes a pro-form for the deleted constituent, or leaves behind the nominal features of the deleted constituent so that the node immediately dominating the deleted material is not erased.

(57) A wipe-out rule is an ID rule which deletes a constituent completely, leaving no pro-form, so that the node immediately dominating the deleted material is erased.

I can now state the generalization that wipe-out rules and SI rules obey the No-Ambiguity condition and have a coreference requirement as well as an identity requirement; pronominalization rules do not obey the No-Ambiguity condition and do not have a coreference requirement although they do have an identity requirement. The common formal property between wipe-out rules and SI rules as opposed to pronominalization rules is apparent, for SI rules are also wipe-out rules—they also effect complete deletion of the affected constituents. I can thus state that rules which delete completely obey the No-Ambiguity condition and require coreference; rules which leave pro-forms do not.

4.2 Pronominalization Rules

4.2.0 In Chapter 5 (§ 5.3) of his thesis, Ross discusses a class of
rules which obey the constraint on Pronominalization:

(1) Pronominalization from right to left is possible only if the
pronominalized constituent is in a subordinate clause which does
not dominate the antecedent.5

The rules of English which obey this constraint are:

(2) a. Identical-reference pronominalization
    (If John comes, let's give him hell.)

b. Identical-sense pronominalization
    (John has a beer belly, and I have one too.)

c. it-Sentence pronominalization
    (Sally is innocent, but nobody believes it.)

d. so-Sentence pronominalization
    (Sally might be innocent, but I don't believe so.
    She won't say so.
    If Sally is innocent, why doesn't she say so?)

e. it-VP pronominalization
    (If John won't get rid of that anaconda, somebody else had
    better do it.)

f. so-VP pronominalization
    (If he hasn't done so already, I would advise John to get
    rid of that snake.)

g. VP-Deletion
    (John really ought to get rid of that snake if he can.)

The similarities between (c)-(f) lead one to suspect that these four
rules might possibly be collapsed into one rule, given a suitable con-
dition on the occurrence of it versus so and an explanation of how these
pro-forms come to substitute for sentences in (c) and (d), and (as com-
plements of the pro-verb do) for VP's in (e) and (f). Ross tentatively
proposes a partial solution along these lines, which will not be con-
sidered further here.

Under Ross's extremely broad characterization of pronominalization
rule as any rule which effects deletion of a constituent across a varia-
ble under identity with some other constituent (which I will hereafter
refer to as the antecedent, whether it precedes or follows the deleted or
pronominalized constituent), the rules in (2) are not the only pronomi-
nalization rules. They constitute a proper subclass of the broader class
of deletion rules involving variables, which under Ross's definition are
all pronominalization rules.

Ross's characterization of this subclass as encompassing those rules
which mark a constituent [fpro] under identity with an antecedent, where
[fpro] is not an ordinary syntactic feature, but rather an instruction
to a later rule to effect deletion of the marked constituent with or
without concomitant insertion of a pro-form, is unenlightening. Presum-
bly any deletion rule could be so formulated, and Ross provides no indi-
cation of what considerations would force us to formulate a given deletion
rule with such an intermediate stage.

In this section I will formulate a general characterization of the
notion pronominalization rule, which encompasses all the ID rules which
have the property that they obey the pronominalization constraint (1),
but are otherwise unbounded and insensitive to structure intervening
between the antecedent and the pronominalized constituent (thus also in-
sensitive to island constraints).

4.2.1 The rules in (2), unlike other deletion rules involving vari-
ables, do not obey the general constraints, hereafter called island con-
straints, which Ross found to constrain the domain of variables in de-
letion and movement rules.

(3) Peter is fat, and from the fact that he denies it I conclude that
he is also hung up about it.

(4) Peter also can’t swim, and he is very envious of anyone who can.
(5) That he became so fat on a diet of lichi nuts amazed and trou-
bled Peter.

(3) shows that identical-reference Pronominalization and it-sentence Pro-
nominalization are insensitive to the Complex NP Constraint; (4) that
VP Deletion is likewise insensitive to the Complex NP Constraint; and
(5) that identity-reference Pronominalization is insensitive to the Senten-
tial Subject Constraint. The reader can easily construct more examples
like these.

These rules are also unusual in that, except for the general constraint
stated in (1), they are completely insensitive to structure. They are
neither upward nor downward bounded, as should be clear from the examples
already given; and in fact these rules operate even across sentence boun-
daries:

(6) There’s only one trouble with your plan, Morris. It stinks.
(7) I’ve lost a small furry black spider. Has anyone seen one?
(8) I’m going to push your face in, Piedmont. —If you think you can Ø,
punk, you just try it.

Since in this section I will be concerned with the formal features
which distinguish rules like those in (2) from other deletion rules, and
since Ross’s terminology is in conflict with standard usage anyway, I
will not use the terms as he does.

For the time being, let me establish the following distinction:

(9) An insensitive deletion rule is any rule that effects deletion
under identity with another constituent over a variable, and
like the rules in (2), is (except for the constraint (1)) struc-
ture-insensitive: i.e., operates across sentence boundaries,
is neither upward not downward bounded, is generally insensi-
tive to clausal connections, and does not obey island constraints.

(10) A sensitive deletion rule is any rule that effects deletion of
a constituent under identity with another constituent over a
variable and is in anyway sensitive to intervening structure;
in particular, such rules obey the island constraints.

Note that as observed above two other types of deletion rules (besides
Blanket rules, which are not under consideration here) are possible:
drop rules like the general pronoun deletion rule in languages such as
Turkish, which effect deletion of a constituent absolutely, without reference to an identical constituent elsewhere; and close deletion rules which effect deletion under identity, but not over a variable, such as Equi-NP Deletion.

The characterization (9) of insensitive deletion rules differs from that offered by Ross for the class of pronominalization rules in a fundamental respect: his refers to a formal property attributed to the statement of the rule; mine refers to the formal properties of the variable of the rule. I.e., the variable in sensitive deletion rules is constrained in a way that the variable in insensitive deletion rules is not constrained. Before Ross’s formulation of the constraints, of course, such a characterization was not even possible.

This characterization is not to be taken as a substitute for a definition of pronominalization rule, but only an interim usage. Clearly we need a better characterization of the notion “pronominalization rule” in terms of formal properties of the statement of the rule: one which does not refer to such an artificial device as the [pro] marking, which says no more than that a pronominalization rule is any rule we decide to call a pronominalization rule. To characterize pronominalization rules as deletion rules which do not obey island constraints likewise begs the question, for the moment, what exactly are the formal characteristics of rules which would allow us to predict their sensitivity to the constraints. It is with an eye toward eventually answering this question that I propose temporarily to employ this unsatisfactory characterization of pronominalization rules as insensitive deletion rules.

There are other features which set off insensitive deletion rules as distinct from sensitive deletion rules. Ross observed that, in all known cases, deletion rules which obey island constraints (my sensitive deletion rules) could be formulated as unidirectional deletion rules; i.e., they effect deletion only from right to left or only from left to right, never in both directions. Insensitive deletion rules in general (although there are exceptions in some languages) appear to be able to effect deletion in both directions, subject to the constraint stated in (1).

This correlation between unidirectionality and sensitivity to the island constraints has remained unexplained. It has also remained unexplained why sensitive deletion rules, movement rules which leave no copy behind (chopping rules), and feature-changing rules should obey island constraints in the first place.

We need a characterization of pronominalization rules in terms of formal properties of its statement. We have rejected Ross’s first characterization in terms of [pro] insertion; and we cannot, as Ross suggested, characterize pronominalization rules as bi-directional deletion rules, because there are languages in which there are pronominalization rules (i.e., insensitive deletion rules by my definition; deletion rules which fail to obey island constraints) which are unidirectional. Ross gives as examples Finnish, Ijo, and Gà.

In languages which have unidirectional insensitive deletion rules, the rules are invariably, by the way, left-to-right.
What we have to ask is this: is there a formal property common to the rules in (2), and to any rules we would want to call pronounalization rules? Note that but for VP-Deletion we could generalize as we did in the last section that pronounalization rules substitute a pro-form for the "deleted" constituent. This would correspond to our intuitive (or pre-judged) notion of what pronounalization rules do. An alternative way of looking at it is to say that VP-Deletion appears to be in the wrong class: other rules that effect complete deletion of the constituent to which they apply generally obey island constraints. VP-Deletion is the only wipe-out rule in the class of insensitive deletion rules.

In the following subsection, I will argue that the formulation of VP-Deletion as a wipe-out rule is incorrect, and that when properly formulated, VP-Deletion has formal characteristics in common with the other insensitive deletion rules, so that the class of pronounalization rules defined in the last section will be coterminous with the class of insensitive deletion rules.

4.2.2 The rule of VP-Deletion, if formulated as a rule which simply deletes VP, and thus as a wipe-out rule, is anomalous in several ways. In the preceding section it was shown that wipe-out rules generally obey the No-Ambiguity condition, whereas pronounalization rules, as defined there, do not. But VP-Deletion, although it appears to be a wipe-out rule, does not obey the No-Ambiguity condition:

Note that in (11) the scope of the gap is ambiguous between the senses of (12) and (13):

(11) Someone who can should show me how to wiggle my ears.
(12) Someone who can wiggle his ears, should show me how to wiggle mine.
(13) Someone who can show me how to wiggle my ears should show me how to wiggle my ears.

VP-Deletion is also the only bi-directional wipe-out rule: so that but for this rule, we could formulate a generalization to the effect that wipe-out rules are unidirectional. Also, but for this rule, we could generalize that wipe-out rules are structure-sensitive, and obey island constraints.

These considerations alone would lead us to consider whether the formulation of VP-Deletion as a wipe-out rule might not be wrong. In this section I will argue that there are also empirical reasons for doing so, albeit empirical reasons of a very general and abstract nature.

It appears at first glance that VP-Deletion consists in simply deleting the node VP and all that it dominates under identity with an antecedent VP:

(14) \[ X \ VP_1 \ Y \ VP_2 \ Z \rightarrow X \ VP_1 \ Y \ Z \]
\[ X \ VP_1 \ Y \ VP_2 \ Z \rightarrow X \ Y \ VP_2 \ Z \]
Condition: \( VP_1 = VP_2 \)
(subject to the pronounalization constraint (1))

This formulation presupposes the existence of a VP-node, and it also presupposes that the VP-node does not dominate auxiliaries, which must therefore have a node of their own: i.e., the presumed structure of a sentence is (15):
It should be noted, however, that there is no evidence whatever for the existence of an AUX node. No transformational rule refers to AUX, and phonological evidence is, if anything, counter to the existence of a separate node dominating auxiliaries.

Furthermore, the only evidence for the existence of a VP-node is provided by the three insensitive deletion rules which refer to VP: do-so / do-it Insertion, and VP-Deletion. And just about the only reason for positing the structure (15) is that it is then easier to formulate VP-Deletion as a wipe-out rule.

Ross (1967c) gives persuasive arguments that the structure of VP is that shown in (16) where V₁ must be an "auxiliary" (which he argues is just a verb which has a highly restricted privilege of occurrence):

This structure is also generally accepted by linguists on many sides of the linguistic battleground, although there is furious debate over the labels of the nodes. Chomsky (1970b) represents the structure of VP as follows:

where [spec, V₁] must be an auxiliary.

In the following discussion I assume such a structure for VP; it does not matter what labels are given to the various nodes, or even whether the "auxiliary" node (labelled V₁ in (16) and [spec, V₁] in (17)) has a node-label distinct from V, although I will for convenience refer to this node as AUX and label it so in diagrams. What is crucial to the following discussion is that the AUX node is dominated by the VP node, and is on the leftmost branch of VP.

Chomsky (1970b) and Jackendoff (1971) have investigated similarities between the structures of NP and VP and adopted an abbreviatory notation to facilitate the formulation of generalizations about these structures. What I propose to do is note another such empirical generalization, and propose a formal analogue for the generalization, which will depend crucially on the assumption that VP's have a structure like (16).

The empirical generalization is based on the following fact, which is one of the unexplained facts about pronominalization: pronominalization is possible only for certain kinds of constituents.

In no language I know of, for example, is it possible to substitute a pro-form for a verb. Thus we get no such sentences as
(18) *Whenever John plays the bugle, Harry does the saxophone.

(19) *Because Mike does Italians, Carmen hates Mike.

(20) *Murphy put the eggplant on the table, and Alf did (it?) (to?) the cucumber in the sink.

It was shown in §1.4.6 that even a language like Turkish, which has no VP, cannot substitute a pro-form for a verb.

It is also impossible to pronominalize an adjective:

(23) *Whenever John wears a red shirt, his brother wears a such vest.

Or an adverb:

(24) *Whenever the mburi beat their drums wildly, Mr. Peaslee rattled his tin can full of marbles so.

In fact, pronominalization rules seem to exist only for S, NP, and VP. Furthermore all S's that ever get pronominalized have to be dominated by NP, so that we can reduce sentence pronominalization to a special case of NP pronominalization. VP-complement S's, for example, don't sentence-pronominalize:

(25) *Alf persuaded Harry that Camel should be hit, but Max can't persuade Jerry so/it.

I believe these facts to be universal; I know of no language in which adjectives or verbs can be pronominalized, and indeed no language in which pronominalization rules exists for any constituent other than NP, VP, and (possibly) S.

Thus the question arises, why are there pro-forms for just these constituents? If the characterization of pronominalization rule is to account for the fact that exactly NP's and VP's can be pronominalized, it must refer to a formal similarity between them. An obvious similarity, which is valid for English and any language which has VP, is that they are the only nonlexical category symbols which ever immediately dominate lexical category symbols. There is, however, another formal similarity, if my assumption about the structure of VP is correct: they both have a "complex" structure which is not found under any other type of node (ignoring suggestions by Chomsky (1970b) and Bresnan (to appear b) that adjectives also have a similar node structure; if these proposals are substantiated, some modification of my characterization of pronominalization rule might be required).

By "complex", I mean that NP and VP dominate both lexical and nonlexical nodes. The nonlexical node is (in English, though this may not be universal) on the left branch under the complex node. This node is traditionally called the "determiner" in the case of NP's and the "Auxiliary" in the case of VP's. Chomsky (1970b) calls them both "specifiers". I will refer to these in general as the left branch under the complex node.

Remember that among the insensitive deletion rules only VP-Deletion seemed to be a wipe-out rule. But if the proposed structure for VP is accepted, VP-Deletion cannot be formulated as a wipe-out rule, for if an
AUX is present, VP-Deletion cannot delete the AUX:

(26) Zeke can run the mile in 3.55, but I doubt that Silas can.
(27) *Zeke can run the mile in 3.55, but I doubt that Silas.

So that however VP-Deletion is formulated, if the structure of VP is as indicated in (16), the result must be (28):

```
VP
   |
   AUX
```

(Unless the VP is pruned by some automatic pruning convention, such as Kuroda's (cf. § 3.3.1), which I will discuss presently.)

This means that VP-Deletion is not a wipe-out rule after all; rather it is a pronominalization rule, in the sense of the last section: it leaves a trace of the complex node under which deletion takes place.

I now propose the following characterization of pronominalization rule:

(29) A pronominalization rule is any rule which effects deletion over a variable under a complex node, which does not delete the leftmost branch. I.e., a pronominalization rule is a deletion rule which operates over a variable and leaves a trace of the affected complex node.

It is now possible to state the generalization that pronominalization rules (i.e., trace-leaving deletion rules) are the only deletion rules operating across a variable that are structure-insensitive, and in particular do not obey island constraints.

4.4 Structural Identity Rules and Target Rules

4.4.0 In this section, I will discuss the properties of structural identity (SI) rules in general and compare them to those of other deletion rules, particularly unbounded wipe-out rules.

A class of rules which delete in embedded structures, called Target rules, will be distinguished, and the properties of target rules in contrast to those of SI rules will be determined. In particular, it will be shown that SI rules are downward bounded, obey the NO-Ambiguity condition, and obey island constraints. Target rules will be shown to obey the island constraints and the NO-Ambiguity condition, but to differ from SI rules.
in being downward unbounded. Thus the property of boundedness will be shown to correlate with the identity condition on the rule. It will also be shown that the only downward unbounded wipe-out rules are target rules.

4.4.1 Comparative Deletion

There is a deletion rule involved in the generation of comparative sentences like

(1) John is smarter than Bill (is).

This rule, called Comparative Deletion, apparently has to delete obligatorily the compared constituent smart, but is optional in the case of the rest of the identical portion of the sentence. Note also that if the compared constituent is in an embedded sentence, deletion of the compared constituent is still obligatory, but deletion of anything else is impossible:

(2) John is smarter than I think Bill is.

(3) *John is smarter than I think Bill.

These facts suggest that the obligatory deletion of the compared constituent is effected by a different rule from the rule which optionally deletes other identical stuff in these constructions. The former rule is not downward bounded, the latter rule apparently is.

I will use the term Comparative Deletion to refer to the deletion of the compared constituent only (smart in (1)); I will call the optional deletion of other identical portions of the comparative sentence Compara-

tive Reduction.

The underlying structure for sentences like (1) is far from clear, and there has been considerable discussion (all of it quite inconclusive) on the subject in recent literature (cf. Bresnan, 1971; to appear b; Ross and Perlmutter, 1970); (cf. also § 4.3.3).

Bresnan (1971) points out that many of the syntactic and semantic peculiarities of comparative constructions are exactly paralleled by peculiarities of relative clauses. She proposes an underlying structure for comparatives which is structurally similar to that of relative clauses:

(4)

```
NP
  Det N S
  the tiredness that S
  Jedd felt WM-tiredness
```

```
AP
  Det A S
  { as } tired { as } S
  Jedd felt WM-tired
```

My structures differ from hers in ways inessential to the present discussion.
I am going to present evidence which supports in part this underlying structure, thus further establishing the relation between comparative and relative clause constructions. Then it will be shown that the Comparative Deletion rule is formally related to the rule of Relative Clause Formation.

In my dialect, sentences like (5) are not uncommon:

(5) John is a lot smarter than what you'd think (he is).

The only conceivable source for this what is a relative clause of some kind. Unfortunately we have no relative clauses that look like this: if this is a relative clause, the relativized constituent is certainly 

smart (or else an NP with a head noun like 'extent' or 'amount' containing smart: the difference is not crucial). What I propose, however, is that this is indeed a relative clause of sorts, with an underlying structure something like (6), which is essentially that proposed by Brennan.

(6) S
   VP
  AP
   be
  more
  smart
  than
  NP
  V
  think
  it
  he be
  WH-smart

(A similar structure would underly as-as comparatives.)

Then my dialect simply has relativization of the WH-ed constituent.

i.e., a rule related to Relative Clause Formation, perhaps a generalized form of the same rule, deletes the lower occurrence of smart and proposes the WH. Standard dialect has, obligatorily, deletion of the what as well in this construction. I propose a similar source for comparative sentences where the compared constituent is an NP, as

(7) John dates more girls than Bill (dates).

The dialectal equivalent of this is:

(8) John dates more girls than what Bill dates.

(not "who Bill dates," suggesting that the relativized constituent is not girls, but rather something neuter like amount: 'John dates more girls than the amount of girls Bill dates (that amount of girls)?

It is perhaps relevant that there are languages in which just such a source for comparative clauses is clearly correct, as in Turkish:

(9) Ahmedin olduğu kadar zenginim.
    Ahmet-gen. being amount rich (I am)

    "I am as rich as Ahmet."

(10) Ahmedin yediği kadar yumurta yedim.
    Ahmet-gen. eating amount eggs (I ate

    "I ate as many eggs as Ahmet."

where the comparative clauses are clearly equivalent to relative clauses embedded under the head noun kadar 'amount'.

One might propose that the relative-like what in my dialect is simply an optionally present extra complementizer, i.e., that my dialect has \text{than what} as a variation of the standard than possibly formed by analogy with such constructions as 'this is bigger than what I want'. That this hypothesis is incorrect, however, can be shown by examining a case where relativization is impossible.

It is possible to form comparative clauses in which there is no constituent identical to the head of the phrase in which the clause is embedded:

(11) John writes more plays than Bill does radical pamphlets.

In such constructions, there is nothing in the comparative clause which the generalized relative clause transformation can relativize; consequently nothing gets deleted from the comparative clause by Comparative Deletion. And in my dialect there is no corresponding sentence with what:

(12) *John writes more plays than what Bill does radical pamphlets.

This indicates clearly that the dialectal what is actually a relative pronoun, since it appears exactly when a constituent identical to the head of the complex phrase disappears from the comparative clause.

These considerations lead to the conclusion that for my dialect, Comparative Deletion proceeds in two stages: first, an application of a generalized version of the relative clause transformation "relativizing" a constituent from the comparative sentence (which cannot apply if there is no constituent in the comparative sentence identical to the head con-

stituent of the comparative construction); followed by an optional deletion of the relative pronoun what.

If both my dialect and Standard English are to be accounted for by a unified hypothesis which accounts for both in the most economical manner, it is clearly necessary to posit for Standard English the same derivation for comparative constructions, with the deletion of what being obligatory for Standard English rather than optional.

In what follows I assume such an analysis of Comparative Deletion. It will be seen that the analysis of Comparative Deletion as a movement followed by deletion, which is paralleled by several other formally similar deletion rules, allows certain generalizations to be stated about the nature of deletion rules. If this analysis (and those to be proposed below for similar rules) is not accepted, the proposed generalizations will hold for deletion rules with the exception of rules of a particular class, which I will call target rules:

(13) A target rule is a rule which effects deletion (with or without an intermediate movement of the deleted constituent) of a constituent embedded at an unbounded depth under some "head" constituent, under conditions of identity with the "head".
The underlying structure of comparative constructions is henceforth assumed to be that proposed by Bresnan, as modified in (6). The comparative clause is embedded under a complex node the head of which may or may not be identical to some constituent in the embedded S, indefinitely far down. If this identity condition is met, a generalized version of the Relative Clause Formation rule applies, transporting the constituent in question to the front of its clause and converting it to the pronoun what, which is subsequently deleted. It does not materially affect the argument to follow, except for one tentative generalization to be proposed in the last section, if the rule is formulated simply as a deletion rule.

If no constituent in the embedded S is identical to the head of the complex phrase, this relativisation rule fails to apply and nothing happens:

(15) John writes more radical pamphlets than Harry sells cadillacs.

If portions of the comparative clause are identical to "corresponding" portions of the matrix clause (in a sense which will be clarified below), however, the rule of Comparative Reduction applies:

(16) John has written more radical pamphlets than Harry has scatological letters to the DM.

This rule does not delete the auxiliary of identical verbs, though, even if the auxiliaries are identical. If there is no auxiliary, do-support applies:

(17) John writes more radical pamphlets than Harry does scatological letters.

(18) "John writes more radical pamphlets than Harry scatological letters."

I have no explanation for why the Comparative Reduction rule should be idiosyncratically constrained not to delete AUX in this case. Some people, in fact, find (18) not too bad; and AUX can definitely be deleted if the rest of the VP is deleted: 'John writes more radical pamphlets than Harry'.

Comparative clauses can also occur without overt "head", but only in adverbial function modifying the verb of the matrix S:

(19) John likes cucumbers more than Harry likes radishes.

A complete analysis of comparative constructions would probably require the postulation of some such head as "amount" or "extent" in the underlying structures of all comparative clauses, these included. Furthermore, more in this sentence is clearly the comparative of much or a lot; so that (19) is exactly parallel to (20):

(20) John eats cucumbers faster than Harry eats radishes.

Whether the formulation of Comparative Deletion proposed above is accepted or not, Comparative Deletion is clearly a target rule. As
Ross (1977b) showed, it is not downward bounded:

(21) John dates more girls than one would ever believe it possible
to claim that Bill even asked for dates.

and it effects deletion only under identity with the specifically "compared"
constituent in the matrix S.

The rule of Comparative Reduction, however, is not a target rule.
It applies optionally to delete that portion of the comparative clause
which is identical to a corresponding portion of the matrix clause, but,
as (3) shows, it is downward bounded (again, I use the term bounded
in a somewhat broader sense than Ross; this deletion goes down into an
embedded S, but only "one step down" and no further; thus it is bounded
in the embedded sentence).

This rule also has the structural identity requirement which was
established as a condition on coordinate deletion: note that asks can be
deleted from the comparative clause in (22), but not in (23):

(22) a. John asks Bill for more favors than Sally asks Michael for.
    b. John asks Bill for more favors than Sally does Michael.

(23) a. John asks Bill for more favors than Sally asks questions.
    b. *John asks Bill for more favors than Sally does questions.
(24) *John has cooked the potatoes for more hours than the stew has.
(25) *John runs his dog faster than Bill can.

This can only be accounted for if the deletion involved in Compara-
tive Reduction requires structural identity between the matrix and compa-
rative S.

And it is clear that (26) can only be interpreted as being derived
from (27), not (28):

(26) John broke more vases with a hammer than Michael
(27) John broke more vases with a hammer than Michael broke with
     a hammer.
(28) John broke more vases with a hammer than Michael broke.

(28) is noncommittal as to how Michael broke the vases, but (26)
implies that Michael broke the vases with a hammer too. This can only
be accounted for if the Comparative Reduction rule requires structural iden-
tity between the matrix and comparative sentences.

Such examples can easily be multiplied. Note that the Comparative
Reduction rule cannot be formulated with reference to any particular con-
stituent, since any constituent in the comparative clause can be deleted
under identity with a "corresponding" constituent in the matrix. It is
now clear what "corresponding" means: it means occupying the corresponding
position in an identical structure.

The Comparative Reduction rule also obeys the No-Ambiguity condition
in a non-trivial manner. In § 4.1.3 it was noted that the rule of Compa-
rative Deletion could produce the following sentences:

(29) John knows more girls than Harry knows.
(30) John knows more girls than know Harry.

But note that if Comparative Reduction applies to delete know, the
resulting sentence is unambiguous, and derivable only from (29):
(31) John knows more girls than Harry.

so that the otherwise possible deletion of the verb from (30), since it creates a gap and results in ambiguity, is rejected.

The Comparative Reduction rule is thus formally similar to the rule of Coordinate Deletion, whereas the Comparative Deletion rule bears a formal resemblance to the rule of Relative Clause Formation (if it is not in fact identical to that rule plus a subsequent close-deletion rule).

The formal difference between Comparative Deletion and Comparative Reduction is manifested in two characteristics: the nature of the identity condition on the rule and the domain of the rule. Comparative Deletion is an unbounded rule which deletes a constituent under identity with a particular constituent; Comparative Reduction is a bounded rule which deletes constituents under identity with corresponding constituents in an identical structure.

Consideration of other deletion rules in subsequent sections will show that this correlation is not accidental. It will be shown that while target rules invariably delete under identity with a particular constituent and are otherwise not sensitive to intervening structure (except for island constraints), blanket rules which have the structural identity condition rather than specifying identity with some particular constituent invariably are downward bounded.

4.4.4 Downward Bounded Identity Deletion (ID) Rules

In this subsection I will examine several ID rules which are not target rules, and show that they are downward bounded.

There are several ID rules which effect deletion of a single constituent under identity with an antecedent other than the head of a relative clause structure. One is the rule which gets (h7) from (h6):

(h6) This rock is too heavy for me to pick up [this rock].
(h7) This rock is too heavy for me to pick up.

This rule seems to require formulation with a variable, as Ross (1967b) showed (§ 6.1.3.):

(h8) This rock is too heavy for me to even begin to think about picking up.

Although with increasing length the option of pronominalization of the redundant NP instead of deletion is more likely to be taken:

(h9) This rock is too heavy for me to even begin to think about picking it up.
However, as Ross also showed, this rule cannot delete from embedded sentences:

(50) *This rock is too heavy to claim I can pick up.

This fact is predicted by the generalization stated in (44); the fact that (49) is OK is accounted for by the pruning convention proposed in § 4.3, which removes the S-node from above an infinitivized verb when the complementizer is deleted.

Another rule of this type, also discussed by Ross, is the one deriving (52) from (51):

(51) These socks are ready for you to put [these socks] on.
(52) These socks are ready for you to put on.

This rule, like the last one, has to be formulated with a variable:

(53) These socks are ready for you to start getting ready to try to put on.

But also cannot go down into embedded sentences:

(54) *These socks are ready for you to pretend that Mary put on.

Thus the situation is exactly as before. The rule is an ID rule, but not a target rule, since it is not defined as deletion in an embedded S under identity with a "head". It is consequently downward bounded.

In the next subsection I will examine several rules which delete not a single constituent, but rather an entire sentence, leaving behind a single constituent. These rules must be formulated with the structural identity condition rather than a simple variable. It will be seen that these rules too are downward bounded.

4.4.5 Structural Identity (SI) Rules: Stripping and Whong

These are rules which, under highly specific circumstances, strip away all but one constituent of a sentence, under the condition that all the deleted constituents are identical to corresponding constituents in a structurally identical antecedent sentence. I will show that these rules are downward bounded.

Stripping

This rule, which has been referred to above in § 3.2, is necessary to account for the following fact: in response to a question with a Wh—, it is possible to reply with an NP that could replace the Wh—:

(55) What's Hasan writing? ...A letter.

Since replies like this are fully equivalent semantically to full sentences identical to the underlying structure of the question except that the NP replaces the Wh-ed constituent, it is reasonable to derive them from such full sentences by a Stripping rule:

(56) Q  [ X₁ WH-some Y₁₁ ][...][ X₂ NP Y₂₂ ]₂ → Q X₁ WH-some Y₁ ¥...NP

Condition: S₁ and S₂ identical in structure, and X₁=Y₁, X₂=Y₂.
In other words, the sentences must be identical in structure, and Wh-some and NP must be "corresponding" constituents in the two sentences.

To state this rule in this way, of course, does violence to the assumptions generally made about the scope of transformations. However, the only way to derive these "stripped" sentences in a motivated way is by reference across sentence boundaries.

There are insurmountable difficulties facing any attempt to derive sentences like "a letter" in the base, i.e., by a rule like \( S \rightarrow NP \).

Not only would such an approach leave completely unresolved the problem of accounting for exactly where such sentences turn up in discourse (leaving this perhaps to some as yet unspecified discourse component), but there are cases where the constituent remaining after Stripping is constrained by certain restrictions which cannot be stated except in terms of the grammar of the Stripped sentence.

In a language with overt case marking, for example, the remaining constituent has the case appropriate to its function in the sentence which has been stripped away:


which follows automatically from the proposed derivation by Stripping, but which cannot be accounted for at all by a hypothesis which attempts to generate stripped sentences in the base.

In Turkish, there is a similar rule of Stripping:

(59) Hasan ne yaziyor? ...bir mektup.

Hasan what is writing? a letter.

"What is Hasan writing?"...a letter.

There is a very general constraint, however, which prohibits the separation of a generic object from the verb by any deletion or movement rule, so that (60) cannot be converted by Stripping to (61):

(60) Hasan ne yaziyor? ...mektup yaziyor.

letter(s) he is writing

(61) Hasan ne yaziyor? ...*mektup.

The generation of *(61) is blocked by a very general constraint if stripped sentences are derived by a rule of Stripping, but if such sentences are supposed to be generated in the base, it is impossible to block *(61) at all, except by some ad hoc "discourse" restriction. Such a restriction would have to refer to the context of Stripping, and in fact would have to refer to the fact that the Wh- ne in the antecedent S is in direct-object relation to the verb, since it is only generic objects that are blocked in this context: generic subjects, for example (which are in no way overtly marked as distinct from generic objects) can be left behind by Stripping.

(62) Hayvanların en aptali ne-dir? ...ay% of the animals the most stupid is what? ...bear
In view of these facts, I think it can be considered established that stripped sentences are derived by a syntactic rule of deletion, or an equivalent device: any "interpretive" or "discourse" rule, in order to account for the facts, would have to have the same formal properties as the Stripping rule proposed here.

What is of interest at this point is the structural identity condition, without which it would be impossible to state such a rule. The rule cannot simply be stated with variables, because it requires the notion of "corresponding" constituent, which is available only if the structural identity condition is met.

This rule is clearly downward bounded:

(63) What's Hasan writing? ... I think that a letter. o
    ... Ali says that a letter.
    ... that a letter is obvious.

It thus a fortiori obeys island constraints:

(64) What's Hasan writing? ... a letter and Mehmet is writing graffiti on the wall. (a juncture after letter makes it good.)
    ... the fact that a letter is obvious.

And, trivially, deletes only from left to right.

Wrong

This rule was also referred to in § 3.2.1. It produces terse or obstreperous contradictory responses by stripping away all but one constituent of a sentence identical (except for that constituent) with an antecedent S. The antecedent may be either a statement or a question:

(65) Did Harry find the anaconda? ... (no), Harry.
(66) Harry found the anaconda! ... (no), Harry.
(67) Did Harry find the anaconda? ... (no), the eggplant.

The arguments for deriving contradictory responses like these by a transformational rule are similar to those given above in the case of Stripping.

The conditions for this rule are somewhat more complex in that it seems there is some interaction with Focus. Consider:

(68) Did Harry find the anaconda? ... No, Harry.

It is difficult to interpret this as a reduced form of (69), rather it seems more like a reduced form of (70):

(69) Harry found the anaconda.
(70) Harry found Harry.

If my intuitions are right about this (and they match those of other people I've asked) it seems that for wrong to apply, the stripped sentence must be not only structurally identical to the antecedent S, but also have identical Focus.

This identity of Focus-placement as part of the structural identity condition was found in Chapter 2 to be required in the case of other ID rules. There I proposed that identity of Focus should be made part
of the universal definition of structural identity. If that proposal is correct, then the rule of Wrong needs no extra condition. Note that the rule of Stripping meets this condition automatically, since the Focus-placement rule will have to place Focus on the constituent which matches the WH-:

(71) What is Harvey writing? ...Harvey is writing a letter.
    ...
    ...
    *Harvey is writing a letter.

Whatever the interaction with Focus, the rule of Wrong clearly cannot be stated without the notion of identity of structure. I give here a formulation which presumes that identity of Focus is also required:

(72) \[ X_1 \hat{A} Y_1 ]_{S_1} \ldots [ X_2 \hat{B} Y_2 ]_{S_2} \Rightarrow X \hat{A} Y \ldots \hat{B} \]

Condition: \( S_1 \equiv S_2 \), \( X_1 = X_2 \), \( Y_1 = Y_2 \), where \( \equiv \) is structural identity.

[NB that \( X_1 = X_2 \), \( Y_1 = Y_2 \), and \( A = B \) suffice to define \( S_1 \equiv S_2 \)]

This rule is downward bounded:

(73) Did Harry find the anaconda? ...I think that the eggplant. \( \hat{P} \)
    ...
    *That the eggplant is obvious.
    ...
    *Aren't you aware of the fact that the eggplant.
    ...
    *The eggplant and he's eaten it.

And, like Stripping, deletes only from left to right.

Summarizing the results of the preceding investigation of SI rules and of this subsection so far, it appears that

(74) Structural identity rules are downward bounded.

Not if

A third rule of this type produces (75) from (76):

(75) Sex is not a sin - not if you enjoy it.
    (76) Sex is not a sin - Sex is not a sin if you enjoy it.

This rule can derive other sentences as well:

(77) Sex is not a sin {only} when {not} you enjoy it.

I assume that (75) is derived from (76) by a deletion rule. I see no other way to account for the synonymy of (75) and (76), and the only alternative entails a rule of the base like (78):

(78) \( S \Rightarrow \) not if...

This rule is clearly a SI rule. Therefore, according to the generalization stated in (74), it should be downward bounded, and it is:

(79) Sex is not a sin - *I think that not if you enjoy it.
    - *That not if you enjoy it is clear.
    - *Anyone who thinks that unless you enjoy it, is nuts.
Thus the generalization (74) is borne out; I propose this generalization as a universal of linguistic theory. I also propose

(80) SI rules delete only from left to right.

These generalizations constitute powerful constraints on the formulation of deletion rules in particular grammars. They predict that no rule in any grammar formulated with the SI condition can ever be downward unbounded.

This implies that any downward unbounded (wipe-out) deletion rule must be a non-SI Deletion rule, and it has been shown that of the non-SI ID rules, only the restricted class of target rules are downward unbounded. So these conditions predict that in no grammar of any natural language will a rule occur which can delete under identity a constituent indefinitely far down, except for rules which delete in complex structures under identity with the head of the complex structure.

The condition that SI rules are universally left-to-right deletion rules also constitutes a powerful constraint. It would reject out of hand, for example, Ross's formulation of Gapping as a bi-directional deletion rule, because Gapping must be formulated with a SI condition and SI rules cannot delete backwards.

4.4.6 Sluicing

Sluicing, proposed by Ross (1969b), is a rule which derives (82) from (81):

(81) John's looking for someone, but he doesn't know who he's looking for.

(82) John's looking for someone, but he doesn't know who.

Ross gives persuasive arguments for the existence of this rule; in particular, it is not possible to advance a counterproposal that sentences like 'he doesn't know who's generated in the base'. The most telling counter-evidence to such a proposal is provided by languages like German, which have overt case marking in the interrogative pronoun; for this case marking always agrees with that of the antecedent in the other sentence:

(83) Hans sucht jemand(en), aber er weiß nicht wen.
    Hans seeks someone (acc.) but he knows not whom(acc.)

(84) Hans folgt jemand(en), aber er weiß nicht wen.
    Hans follows someone but he knows not whom(dat.)
    (dat.)

There is no way, under the hypothesis that these sentences are basic, to prevent the wrong case from turning up:

(85) *Hans folgt jemand(en), aber er weiß nicht wen.
    Hans follows someone but he knows not whom (acc.)
    (dat.)

so that the transformational origin of such reduced sentences must be accepted.

Superficially, the rule which affects this deletion seems to be closely related to the rule of Stripping. But there are deep formal differences. Sluicing is unbounded:
(86) John wants to bring someone to the party, but everyone is surprised that he refuses to allow his mother to tell anybody who.

Not only that, Sluicing does not obey the island constraints:

(87) John wants to bring someone to the party, but everyone is surprised at the fact that he won't tell who.

(88) John is bringing someone to the party, but the phone is busy and we can't find out who.

(89) That John is bringing somebody to the party is obvious, but I want to know who.

And it apparently can operate leftward into subordinate clauses:

(90) Although he won't say who, the fact that John is bringing somebody to the party is well known.

It is furthermore almost completely insensitive to the conjunction and grammatical relation between the matrix and the sluiced sentence:

(91) John wants to bring someone to the party and he won't say who.

...but...

although...

(92) Whenever John wants to bring someone to the party, he refuses to say who.

It can even operate across sentence boundary and across ... (which I use to indicate change of speaker):

(93) John wants to bring someone to the party. He won't say who ... Did he say who?

Sluicing behaves, in short, exactly like a pronomialization rule. Is there any other way to account for this behavior? Let us consider the formal differences between the statement of Stripping and the statement of Sluicing.

Stripping is an SI rule, specifying the deletion of all but one constituent from an S identical in structure to the antecedent S; but the constituent remaining after deletion cannot be specified in the statement of the rule, since it can be virtually any constituent of the sentence.

The rule of Sluicing on the other hand can specify exactly which constituent it is that remains after deletion: the WH- which has been proposed by WH-fronting and occupies the complementizer position in its sentence.

**Sluicing**: [X₁ some-NP Y₁]₁ S₁ Z [WH-NP X₂ Y₂]₂ → S₁ Z WH

**Condition**: X₁ = X₂', Y₁ = Y₂

Recall that the characterization of pronomialization rule proposed in § 4.2.2 specified that any rule which effected deletion under S, NP, or VP nodes leaving behind the left-most branch (and thus, by the pruning convention also proposed, the complex node itself) was a pronomialization rule, and should, if other generalizations proposed there are correct, be unbounded, ignore island constraints, and be structure-insensitive except for the pronominalization constraint.
By that characterization, slauing is a pronounization rule, since it deletes everything from under an S-node except the WH-complementizer, and thus its behavior as a pronounization rule is accounted for. This constitutes empirical support for the characterization of pronounization rules as trace-leaving deletion rules, and the generalization that deletion rules having this property also have the characteristics of unboundedness and structure-insensitivity.

Conclusion

Several deletion rules have been discussed in the preceding section which have the SI requirement. These rules all obey the Deletion Constraint proposed in Chapter 2. The rules of Stripping and Wrng were shown in Chapter 2 to obey the constraints.

In the preceding section it was shown that the rule of Comparative Reduction was an SI rule and downward bounded, and that it obeys the No-Ambiguity condition. This rule also obeys the Deletion Constraint of Chapter 2:

1. John writes Mary more letters than Harvey.
2. John writes Mary more letters than Harvey.
3. John writes Mary more letters than Harvey writes Mary.
4. *John writes Mary more letters than Harvey writes.

(4) cannot be derived from (1) by the rules of Comparative Deletion and Comparative Reduction. This follows automatically from the Deletion constraint, if it is assumed to apply to Comparative Reduction.

The same is true of the other SI rules discussed above, and of all SI rules I know in any language.

4.6 Summary
4.6.0 This section consists of a summary of the results of this chapter.
4.6.1 In § 4.1, the notion of linguistic identity was investigated. It was determined that deletion rules of a certain class (SI rules) were formulated with a SI condition, whereas others (ID rules) were formulated to delete under identity over a variable. The universal recoverability condition was investigated, and it was shown that a strong reformulation of the condition which blocked derivations resulting in ambiguity was necessary to account for the behavior of SI rules.

This reformulation constitutes an important theoretical innovation, for the recoverability condition as formulated by Chomsky (1965) was a condition on the formulation of transformational deletion rules. The strong recoverability condition proposed here is a condition on the mapping defined by the rule. A rule may be formulated in such a way that its application in particular instances could create potential ambiguity; but it has been shown that a general condition (theNo-Ambiguity condition) on the mapping defined by a rule rejects any derivation which produces an unrecoverable gap.

The justification for the addition of this condition to linguistic
need not be stated as a condition on a particular rule or as a condition in a particular grammar; at the same time it allows many deletion rules to be formulated in generality without redundant \textit{ad hoc} conditions. It was argued then that this condition applies not only to the CD rule but also to the Relative Clause rules of Turkish and Japanese.

4.6.2 In § 4.2, I formulated a general characterization of the notion pronominalization rule. It was shown that pronominalization rules could be characterized as "trace-leaving" deletion rules. In order to formulate this characterization it was necessary to adopt a pruning convention to the effect that a complex node is deleted just in case its left branch is deleted. The importance of this discussion is that several generalizations about the nature of deletion rules are possible only if VP-Deletion is formulated as a trace-leaving rule.

4.6.4 In § 4.4, the class of target rules which effect deletion in embedded structures under identity with a "head" is distinguished. It is shown that SI rules are downward bounded, that target rules are the only deletion rules other than pronominalization rules that are not downward bounded.

Footnotes to Chapter 4

1. Cf. the discussion of recoverability in § 0.0 and references cited there. In (a), I am collapsing several of Chomsky's conditions.

2. An approach to such a theory is presented in Orešnik and Perlmutter (1972).

3. For discussion of this and other "island constraints" cf. Ross (1967b).

4. Several such rules are discussed in Ross (1967b, § 6.1.3).

5. There have been claims lately, however, that pronominalization can under some circumstances operate leftward into non-subordinate clauses. Lakoff (1958a) notes that (35) is grammatical, but * (36) is not (these sentences pointed out by Perlmutter):

(35) When he entered the room, Mary kissed John.
(36) *When he entered the room, Mary kissed John.

He concludes that pronominalization leftward is conditioned by the stress borne by the antecedent: a stressed NP cannot be an antecedent. He further concludes that the conditions for well-formed pronoun-antecedent pairs must be stated at a level after the application of the stress rules of the phonological component.
He also cites the following sentence, where leftward pronominalization applies into a nonsubordinate clause:

(37) Mary hit him before John had a chance to get up.

and notes that again the possibility of leftward pronominalization is conditioned by low stress on John.

Lakoff’s treatment of these facts presupposes both sentence-boundedness of Pronominalization and arbitrary stress assignment insensitive to discourse constraints.

Consider (35); it is evident from the position of focus (cf. § 2.2) that the constituent John is presupposed. Thus it must be identical to an occurrence of John in previous discourse. This previous occurrence ought of course be the John underlying he, but then we would have the counterintuitive result that the first John is pronounized by coreference with the second, and the second is destressed by coreference with the first, in short each is presupposed by virtue of the presence of the other. Such nonsense is unnecessary, however, for (35) is impossible as initial sentence in a discourse. In particular, it must be preceded by some discussion of John. Thus both the focus placement and the pronominalization in (35) must be due to presupposition of John from previous discourse.

The question remains why *(35) is out. If right-to-left pronominalization into embedded clauses were really free, we would expect *(35) to be good, but it’s not.

It seems to me that most of the instances of pronominalization attributed to “backwards” pronominalization are really cases of forward pronominalization in discourse. If I am right in attributing the pronominalization in (35) to forward pronominalization with an antecedent in discourse, and if “backward” pronominalization either does not exist or is much more highly restricted than has been thought, an explanation for what is wrong with *(35) is at hand: the pronominalization indicates that there must be a discourse antecedent, and if so, the focus on John is anomalous. *(35) has two instances of John, one of which is marked as presupposed and one as unpresupposed, which is impossible.

Discourse-initial backward pronominalization into embedded sentences does seem to be possible in some cases, however:

(36) Whoever wants it can have this sandwich.

I find that discourse-initial backwards pronominalization is possible (but questionable – none of those feel very good) in clauses which start out to the left of the antecedent: typically in sentential subjects and sentences embedded under the subject NP.

(35) [?] That he is so fat is driving my father out of his mind.

(40) [?] The boy who has been sending her all those presents, ditched Sally.

whereas in a proposed adverbial clause like that in (35) I find discourse-initial “backwards” pronominalization impossible.

To investigate the problem of directionality of pronominalization thoroughly, however, would be far beyond the scope of this thesis. I only suggest that the following possibility be considered:

(b) All pronominalization is from left-to-right.

For even though this may be too strong, I think it is closer to the truth than the hypothesis that leftward pronominalization into embedded clauses is unrestricted.
6. It might be proposed that either it or so in (i) is a pro-adjective:

(i) John is sick but he doesn't look it.

If it or so is a pro-adject, how do you account for the fact that they only turn up after copulative verbs like look and seem, never anywhere else?

(ii) *John looks sick, but he isn't it.

(iii) *John is sick, but he doesn't look like he is it.

And also, why not

(iv) *John is sick, and I look it.

I think these it/so are S-pronomes, and that the underlying structure is (v):

\[ \text{NP} \rightarrow \text{VP} \rightarrow \text{S} \]

This would account for why the "pro-adject." only turns up after certain verbs; it's only possible with verbs that occur in such structures, i.e., verbs which take S-complements: NP V S. This underlying structure for look is supported by the existence of "John looks to be sick," which has to come from such a source.

This also accounts for *(iv), since the S-complement has to have John as subject in 'John looks sick' and I as subject in 'I look sick.' S-pronominalization can't have applied in *(iv).

There are languages like German and Turkish in which there are no such sentences as 'John is sick, but he doesn't look it':

(vi) Hans ist krank, aber er *scheint es nicht.
    *sichet es nicht aus.

(vii) *Nehmet hastas, ana (omu) güzümsiyors.
     Nehmet sick but it doesn't seem

And this would follow from the source I propose for 'he looks it' because these languages also lack verbs like look that take S-complements. German does have:

(viii) Hans ist krank, aber er sieht nicht so aus.

and so might be an adverb of a pro-S, but certainly not a pro-adject.

(ix) Hans ist der reichste Mens. in Dorf, aber er sieht nicht so aus.

Note, finally, that the same objection applies to it in English: if it is a pro-adject in 'but he doesn't look it', what about:

(x) John is the richest man in town, but he doesn't look it.

(xi) John has more money than any of us, but he doesn't look it.

7. This sentence was discovered on the Coming Attractions board of the Crown Theatre in New Haven, Conn.
Comparison of (iii) and (25) indicates that there is, after all, a coreference crossover constraint in these cases, which prevents relativization of a target NP which is commanded by a coreferent NP, as Ross claimed.

c. (p.328) The application of two such rules to different underlying structures can produce ambiguity, as in the well-known example:

(i) The chickens are ready to eat.

This will not be ambiguity of the forbidden sort, if the rule which deletes object NP's in ready constructions is regarded as distinct from the ordinary Equi which deletes subject NP's in such constructions. This seems reasonable, since there certainly are two such distinct rules, with quite different sets of governing verbs (ready appearing to be accidentally a member of both classes).

d. (p.331) This whole discussion strikes me now as somewhat bizarre. I have left it in because it is perfectly consistent with the approach to "pronominalization" rules which I was pursuing, and because embedded in the discussion are some observations which I believe are correct and independently valuable.

e. (p.337) I should have pointed out here that the theory of "pronominalization" rules developed in the next section provides an explanation for this difference. Pronominalization rules are characterized by deletion of all but a fixed remnant of the attacked constituent; identity (including coreference) is required between all deleted segments and corresponding antecedent segments. It is not, of course, required of pronominal remnants.
f. (p.347) This is essentially the proposal of Chomsky (1957). In that system, there are no rules that refer to the phrase category AUX; Rules such as Subject-Aux inversion, Negative placement, etc. must be formulated with reference to "the first element of AUX" (cf. Chomsky (1957), pp. 61-62), or something even more bizarre. Chomsky (1965) proposes a more complex structure for predicate phrases, but the treatment of auxiliaries is essentially the same.

g. (p.347) In fact, do so and do it do not constitute evidence for the existence of a VP category. In these anaphoric expressions, do is the (agentive) main verb do, and the anaphoric substitutes (so, it) replace the complement of this agentive do. Hence they might well be regarded as pro-sentential anaphors rather than pro-VP anaphors.

h. (p.349) Certain comparative constructions look like counter-examples to this claim:

(i) John plays the bugle better than Harry does the saxophone.

Further examination reveals, however, that what happens in general in these cases cannot be described as the substitution of do for the verb of the comparative clause:

(ii) I asked Louise to dance as politely as you did Sue.

(iii) I put the eggs in the bag as carefully as you did the tomatoes.

It appears that this auxiliary do is restricted to comparative and related constructions, and serves the same purpose as do-support, namely to carry tense when the tense-bearing element has been deleted (p 382). The do is thus in no sense a pro-verb.

i. (p.349) Probably such is, in fact, a pro-AP in such sentences as

   (i) It has to be an odd number evenly divisible by four, but there aren't any such numbers.

   and the right generalization is that there are pro forms for phrase categories but not for lexical categories.

   Note that the indefinite nominal pronoun one, although it appears to substitute for a simple N, in general replaces (AP)\textsubscript{o} N or (AP)\textsubscript{o} N (PP), or even (Det)(AP)\textsubscript{o} N (PP):

   (i) John likes the big blonde and I like the little one.

   (ii) I have a narrow red and black tie with polka dots on it, but I need a wide one.

   (iv) He owns a car, but he doesn't need one.

   This indicates that one should be regarded as substituting for a phrase category, and that NP's such as the ones in ex. (iii) have a stacked NP structure.

j. (p.351) The putative rule of "Super-Equi" (cf. Grinder (1970), Neubauer (1970, 1972)), in Grinder's original formulation, would be a counterexample to this claim, since it is supposed to wipe out a subject over a variable, and (according to Neubauer) is not blocked by island constraints. In spite of the considerable attention which it has attracted, the nature of this process remains shrouded in mystery; however, as Neubauer (1972) points out, its properties are not straightforwardly those of an unbounded anaphoric deletion. There is sensitivity to the semantic nature of the predicate immediately containing the clause to be stripped of its subject, and there is an "intervention" effect such that control of the deletion by a particular NP is impossible if another possible controller intervenes between it and the deletion site. Furthermore, this rule seems to require that the antecedent command the deletion site even when the antecedent precedes the target. The rule is consequently not an ordinary "pronounization"-type rule, whatever it is.
k. (p.380) They don't really lead to that conclusion. There could just as easily be two strategies for comparative clause formation in my dialect, one involving movement and the other involving simple deletion, as is probably the case for restrictive relative clauses in English. In that case the "Left Branch Constraint" prevents (12), while (11) is a case of what Bresnan (1975) has called "Subdeletion" (deletion of the [left-branch] QP from the target NP).

The conclusion in the next paragraph, then, would also not follow.

l. (p.382) I failed to notice that there is reason to believe that something does "happen" in the derivation of such sentences:

(i) The door is wider than the table is long.
(ii) *The door is wider than the table's long.

The failure of contraction indicates the presence of a deletion site following the auxiliary; furthermore the "target" AP or NP in these comparatives cannot have an overt measure or determiner phrase. It seems reasonable to assume that such a phrase is deleted by Comparative Deletion in such cases (Bresnan's "Subdeletion"). That would account for the above facts and for the fact that such targets cannot be embedded within islands:

(iii) *The door is wider than we destroyed the evidence that the table is long.

m. (p.386) It is also possible that this fact reflects a parallelism condition, to the effect that unless the Controller and Target of Comparative Deletion are in parallel position, Comparative Reduction cannot take place.

n. (p.392) What (44) said was that wipe-out rules other than target rules (i.e. wipe-out rules where the antecedent is not the head of a complex structure) are always downward bounded. Such rules (again excepting Super-Equi, cf. note j) are generally sensitive to the grammatical relation of the antecedent and the item to be deleted, and have to be cyclic in a cyclic theory, for the same reasons that Equi and Reflexivization do. The pruning proposal referred to here was an attempt to account for, among other things, the observation that some of the rules of this class can operate into infinitival complements (generally Equi/Raising remnants).

I am certain that the deleted pruning proposal is no good, but in these cases I still think I was on the right track. There needs to be some way of characterizing such infinitival phrases as something less than full clauses ("quasi-clauses", as Postal (1974) suggests), and one of their properties is that relation-controlled deletion rules, which are blocked by full clause boundaries, can operate into them.

o. (p.396) There are some pretty good sentences which appear to contradict this, viz:

(i) ... I think a letter.

Upon a little reflection, however, it becomes clear that the "matrix" expressions which are possible in such pretty good cases of apparent downstairs stripping are just the class of "parentheticals" (Hooper and Thompson (1973)). The clauses in which Stripping applies are thus clauses which in many other respects behave as if they were non-embedded, in spite of the fact that they are logically, and superficially appear to be, complements of the "parenthetical" predicate.

Conclusion

The purpose of this investigation has been to discover and formulate empirically motivated constraints on the power of deletion rules in syntax. Much of the investigation was devoted to establishing the properties of Coordinate Deletion, and the majority of the empirical results of the first three chapters are universal constraints on that rule.

In Chapter 6, however, it was shown that many of the properties of CD are shared by other formally similar rules, and that devices required to account for the facts of CD are also required to account for other deletion phenomena.

The goal of any serious linguistic investigation is to discover what language is like, and to state empirically supported conclusions explicitly enough that they make non-vacuous claims about the nature of language. I hope that I have presented the results of my investigation with such a degree of explicitness that where I have drawn a conclusion which is invalid, its invalidity is demonstrable. As I have learned from the work of John Ross, an assertion which is demonstrably wrong is immeasurably more valuable than one which is indeterminable.

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