
Gapping and Related Rules

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Gapping and Related Rules

The English rule of *Gapping* was first discussed from the point of view of generative grammar by Ross (1967a); subsequent discussion has appeared in Ross (1967b), Langacker (1969), and Dingwall (1969). This paper is an attempt to relate it to other rules of English.

The simplest cases of Gapping delete¹ the verb of one or more clauses conjoined to the right of a clause containing the same verb:

- (1) a. Max ate the apple and Sally the hamburgers.
- b. Ivan plays krummhorn, Boris fluegelhorn, and Schwarz bassethorn.

This rule differs from the rule of Conjunction Reduction in that the latter deletes material only from the ends of conjoined clauses, not from the middle. (2) illustrates typical cases of Conjunction Reduction:

- (2) a. Jack hates Sue and is loved by Mary. (Left-hand end of second clause deleted).
- b. Vera sent a baby alligator to Max and a leather dinosaur to Phyllis. (Left-hand end of second clause deleted.)
- c. Mary is believed to be, and Sue definitely is (,) pregnant. (Right-hand end of first clause deleted.)

If Gapping were merely an extension of Conjunction Reduction, we might expect sentences like (3) to be good as well, in which an NP is deleted out of the middle of the second clause.

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

The difference between the two rules will be confirmed as we investigate the Gapping rule further, so we will feel justified in treating Gapping as an entirely independent process.

¹ One might instead conceive of Gapping as a rule of semantic interpretation which supplies a reading for one or more unexpanded nonterminal nodes, along the lines suggested in Jackendoff (1969a, Chapter 3, §2). However, since the choice between this and a transformational account seems immaterial to the main points to be made, I will remain in the more familiar transformational framework.

The conditions on Gapping can be conveniently divided into two types: those concerning the connection between the two clauses, and those concerning the structure and permissible deletions in the second clause. The former are fairly easy to specify: Gapping occurs only when the clauses are connected by the coordinating conjunctions *and*, *or*, and *nor*:

- (4) a. Sam plays the sousaphone, and Max the saxophone.
 b. Either Sam plays the sousaphone or Jekyll the heckelphone.
 c. Sam doesn't play sousaphone, nor Medusa sarrussophone.

Many speakers also find *but* an acceptable conjunction:

- (5) ?Bill ate the peaches, but Harry the grapes.

Gapping does not occur with subordinating conjunctions:

- (6) a. *Sam played tuba whenever Max sax.
 b. *McTavish plays bagpipe despite the fact that McCawley the contra-fagotto d'amore.

A surface structure resembling gapped sentences appears in (7):

- (7) I no more could have stolen that steak than Jack the diamonds.

However, the deletion possibilities in this context are much freer than in the normal Gapping contexts (4)–(5):

- (8) a. Bill ate more peaches than $\left. \begin{array}{l} \text{Harry} \\ \text{Harry did} \\ \text{Harry did grapes} \\ \text{Harry grapes} \\ \text{Harry will grapes} \end{array} \right\}$.
 b. Bill ate the peaches and $\left. \begin{array}{l} * \text{Harry} \\ * \text{Harry did} \\ * \text{Harry did the grapes} \\ \text{Harry the grapes} \\ * \text{Harry will the grapes} \end{array} \right\}$.

Since a rather free deletion rule is known to be associated with comparative constructions, we will assume that (7) is a special case of comparative deletion rather than Gapping.

One more case that might be considered an instance of Gapping is in the relative clause of (9), where a verb has been deleted, leaving the subjects and objects intact:

- (9) I met the girl who Dave and who Tom kissed.

To call this an instance of Gapping would involve a considerable complication of the English Gapping rule, since, contrary to usual procedure, the verb in the left-hand conjunct has been deleted. However, after *wh*-preposing, the verbs are on the extreme

right-hand end of their clauses, so Conjunction Reduction will correctly delete the left-hand verb (assuming the proper ordering of transformations). Thus there is no need to extend Gapping to handle this case.

Now let us observe conditions on the rule which involve the content of the gapped clause. For convenience, call the material deleted "the gap". Gapping cannot take place if there are unlike auxiliaries:

- (10) a. *John has written the words, and Paul $\left\{ \begin{array}{l} \text{will} \\ \text{is} \end{array} \right\}$ the music.
 b. *Tom will smoke the grass, and Reuben $\left\{ \begin{array}{l} \text{might} \\ \text{has} \\ \text{is} \end{array} \right\}$ the hash.

If the auxiliaries are alike, Gapping must delete the second auxiliary as well as the verb: if the auxiliaries in the second clause of (10)–(11) are removed, the interpretation of the gap includes both the verb and the auxiliary of the first clause:

- (11) a. John has written the words, and Paul (*has) the music.
 b. If the ants were called elephants and elephants (*were) ants, I'd be able to squash an elephant.

Gapping cannot tolerate unlike adverbs preceding the verb, either:

- (12) a. *Simon quickly dropped the gold, and Jack suddenly the diamonds.
 b. *Max sometimes beats his wife, and Ted frequently his dog.

But at least sometimes the gap must include an adverb of the first clause. The gaps in (13) are *quickly drops* and *sometimes beats*, not just *dropped* and *beats*:

- (13) a. Simon quickly dropped the gold, and Jack the diamonds.
 b. Max sometimes beats his wife, and Ted his dog.

Not everything in the VP to the left of the verb can gap, however. Ross points out that a negation in the auxiliary cannot gap; (14a) does not become (14b):

- (14) a. I didn't eat fish, Bill didn't eat rice, and Harry didn't eat roast beef.
 b. *I didn't eat fish, Bill rice, and Harry roast beef.

Rather the form with *nor* must be used, as in (4c).²

² If Gapping is a transformation, rather than an interpretative rule, judicious ordering of rules can account for the restriction on negation. Gapping must precede subject-aux inversion and *do*-support in order to produce *Did Bill eat the peaches, or Harry the grapes?* The inverse ordering would predict instead **Did Bill eat the peaches or did Harry the grapes?* With Gapping before inversion, (9) would have the form (i) at the time Gapping applies:

(i) Bill past neg eat the peaches, nor Harry past eat the grapes.

This will account for the absence of *do* in the second clause, but the material in the VP to the left of the verb is still not the same in the two clauses. We can remedy this by adopting Klima's (1964) account of negation, which generates *neg* at the front of the sentence and moves it into the auxiliary by a transformation which precedes subject-aux inversion. If Gapping is ordered before *neg*-placement, (9) will have the form (ii) when Gapping applies:

Gapping possibilities are affected by the material to the right of the verb as well. Note first of all that identical NPs or PPs next to the verb can gap, if followed by another constituent:

- (15) a. John writes poetry in the garden, and Max in the bathroom.
 b. Paul Schachter has informed me that the basic order in Tagalog and related languages is VOS; Ives Goddard that the unmarked order in Algonkian is OVS; and Guy Carden that the basic order in Aleut is OSV. (Ross 1967a)
 c. Charlie went into the bedroom at 5:30, and Lola at 5:31.

One exception seems to be the case where the verb is followed by a noun phrase or prepositional phrase and an infinitive. As Ross points out, Gapping of the NP or PP is unacceptable:

- (16) a. *I want Bob to shave himself, and Mary to wash himself.
 b. *Bill is depending on Harry to find the way to the party, and Sue to find the way home. (where the gap is *is depending on Harry*)

Note that if the verbal complement is only an infinitive, Gapping of the verb is permitted:

- (17) Bob tried to wash himself, and Mary to read the funnies.

Somewhat more remarkable is the fact that identical NPs, PPs, clauses, and infinitives not adjacent to the verb can gap, given proper contrastive stress in the first clause:

- (18) a. Arizona elected Goldwater Senator, and Pennsylvania (,) Schweiker.
 b. Max writes poetry in the bathroom, and Schwarz radical pamphlets.
 c. Maytag will give a brand new dryer to the winner of the Mrs. Albania contest, and General Electric (,) four hundred light bulbs.
 d. Ralph told Dick Deadeye that Little Buttercup sold treacle, and Sir Joseph (,) the Captain.
 e. Jack begged Elsie to get married, and Wilfred (,) Phoebe.

In this respect Gapping again differs from Conjunction Reduction. Conjunction Reduction applying to the right-hand end of a sentence invariably deletes material from

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- (ii) *neg* Bill past eat the peaches, and *neg* Harry past eat the grapes.

Gapping will delete *past eat* in the second clause, and *neg* will have to attach to *and* to form *nor*. Thus this analysis of the rules and their ordering automatically predicts the existence of (9) and the nonexistence of (28). On the other hand, if there is a rule positioning adverbs in the auxiliary, Gapping must follow it to predict (23)–(26).

Note that for this argument to be good, there must be a stage in the derivation where *neg* is at the front of the negated clause. This means that in a grammar deriving negation from higher sentences, the initial reduction rule must produce Klima's base form.

Also notice that under this argument Gapping cannot be an optional "anywhere" rule, as Ross would like to claim. This is particularly true if it must be ordered after an adverb placement transformation, essential to the view that adverbs are derived from higher sentences.

the left-hand conjunct, as in (2c), while Gapping deletes material from the right-hand conjunct, as in (18). We can produce more or less equally felicitous sentences from (19a) by applying Gapping to both the verb and the complement sentences, as in (19b), or by applying Conjunction Reduction to the complement, then Gapping to the verb, as in (19c):

- (19) a. Harry told Sue that Albania is a lovely place for a vacation, and Tom told Sally that Albania is a lovely place for a vacation.
 b. Harry told Sue that Albania is a lovely place for a vacation, and Tom Sally.
 c. Harry told Sue, and Tom Sally, that Albania is a lovely place for a vacation.

One more unusual property of Gapping has been pointed out by Ross (in a Forum Lecture at the 1969 Linguistic Institute). Any number of embedded infinitives can delete, as long as one unlike constituent remains:

- (20) Max seemed to be trying to begin to love Harriet, and Fred (((to be trying) to begin) to love) Sue.

What Ross did not point out is that the unlike constituent may be an NP somewhere among the infinitives, given proper stress:

- (21) Max seemed to be trying to force Ted to leave the room, and Walt (,) Ira.

The constraint noted in (16) seems to apply here too: if among the embedded infinitival complements there is one of the form *NP-VP*, only the NP can remain. Contrast (21) with (22), where the infinitive remains:

- (22) *Max seemed to be trying to force Ted to leave the room, and Walt to stay a little longer. (where the gap is *seemed to be trying to force Ted*)

These examples appear to show that Gapping cannot be simply formulated as deletion of a variable, as Ross hoped. Rather the rule seems to require an unlike constituent somewhere in the VP. I offer no suggestions as to how this can be stated for examples like (20)–(22), however.

So far we have only looked at examples with one unlike constituent to the right of the verb. With two unlike constituents, the acceptability of Gapping varies. With two NPs the result is marginal at best:

- (23) a. *Arizona elected Goldwater Senator, and Massachusetts (,) McCormack (,) Congressman.
 b. *Millie will send the President an obscene telegram, and Paul (,) the Queen (,) a pregnant duck.

Likewise with a noun phrase plus a clause or infinitive:

- (24) a. ?*Schachter informed Haj that Tagalog is VOS, and Goddard George that Algonkian is OVS.
 b. *Frank forced Tom to shave himself, and Sam (,) Harry (,) to watch.

With a complement NP-PP, sentences with gapped verbs are rather poor if the PP is strictly subcategorized by the verb (25a, b), somewhat better if the PP is not strictly subcategorized (25c, d):

- (25) a. ?*Willy put the flowers in a vase, and Charlie the book on the table.
 b. ?*Maytag will give a brand-new dryer to the winner of the Mrs. Albania contest, and General Electric four hundred light bulbs to the loser.
 c. ??Ivan writes plays in the bedroom and Schwarz radical pamphlets in the bathroom.
 d. ??Charlie entered the bedroom at 5:30, and Vera the kitchen at 6:00.

In by far the most acceptable examples of Gapping, then, there is only one unlike constituent in the second verb phrase, and all the rest must delete. To handle (23)–(25), we could conceivably add a fairly complex set of conditions, with each condition marked with a degree of grammaticality. This solution would not reveal anything interesting, but only state the facts. Alternatively, we could account for the lower acceptability of (23)–(25) by not having the grammar produce them at all, thus enabling us to state the Gapping rule more simply. The fact that they are at all good would be attributed to an illegitimate mixture of the effects of Gapping and Conjunction Reduction. (23a), for example, could be treated as a confusion of the fully grammatical gapped construction (26a) and the fully grammatical conjunction reduction construction (26b).

- (26) a. Arizona elected Goldwater Senator and Massachusetts McCormack.
 b. Arizona elected Goldwater Senator and McCormack Congressman.

Under this analysis we can simplify the statement of the Gapping rule and at the same time account for the lower acceptability of (23)–(25) (though we have not yet accounted for the differences between them). Objections about “appeals to performance without a theory of performance” seem to me unreasonable here: we must have some examples of what we want a theory of performance to account for before we can formulate one.

What if the verb phrases are entirely identical? (27a) is certainly out; but notice that its presumed source (27b) is not so good either, except perhaps with special stress:

- (27) a. *Bill ate the peaches, and Harry.
 b. ?Bill ate the peaches, and Harry ate the peaches.

If we add *too* to (27b), making it acceptable, the expected output of Gapping, (28), is not terribly bad:

- (28) Bill ate the peaches, and Harry, too.

With *or* as the conjunction, we get a comparable result, but *nor* does not seem to work:

- (29) a. Either Bill ate the peaches, or Harry.
 b. *Bill didn't eat the peaches, nor Harry.

Again the question arises as to whether we should regard these sentences as grammatical instances of Gapping or as derivatively interpreted. It is harder to answer in this case, because there are fewer relevant examples. I will leave the issue open.

The rule that more commonly operates in case the verb phrases are entirely identical is what has been called³ VP-deletion. This rule, unlike Gapping, always leaves behind one or more auxiliary verbs, occasioning *do*-support if only Tense is present in the auxiliary:

- (30) a. Bill ate the peaches, and Harry did, too.
 b. Either Ivan will write the play, or Boris will.
 c. Tom hasn't smoked the grass, nor has Reuben.
 d. Frank may have told Chet, and Joe may have, too.

It does not tolerate unlike adverbs between the auxiliary and the main verb. An identical adverb will be deleted; the missing VP in (31b) is *quickly eat the peaches*, not just *eat the peaches*:

- (31) a. *Bill must quickly eat the peaches, and Harry must slowly.
 b. Bill must quickly eat the peaches, and Harry must, too.

VP-Deletion also differs from Gapping in that it can take place with a relatively wide range of connections between the two sentences:

- (32) a. Charlie will leave town if his mother-in-law doesn't.
 b. Whenever Russia has made a major political blunder, the U.S. has too.
 c. Tom swam the English Channel because he believed that Suzy expected him to show her that he could.

Like pronominalization, VP-Deletion can (at least sometimes) delete the left-hand verb phrase if it is in a subordinate clause.

- (33) a. Anyone who can (,) should show me how to wiggle my ears.
 b. If he hasn't yet, John should try to climb the Eiffel Tower.

Thus VP-Deletion is clearly distinct from Gapping.

We have seen that the characteristic feature of gapped sentences is that material has been deleted from the middle of a phrase. Are there any other instances of such a deletion process in English? The following examples seem to illustrate a similar deletion with a noun phrase:

- (34) a. Bill's story about Sue and Max's about Kathy both amazed me.
 b. I bought three quarts of wine and two of Clorox.

³ In, for example, Ross (1967c).

- c. Scientists at the South Hanoi Institute of Technology have succeeded in raising one dog with five legs, another with a cow's liver, and a third with no head.

Though this construction has not to my knowledge been discussed in the literature, a related, but simpler one is treated in, for example, Perlmutter (1968) and Jackendoff (1968b, 1969b):

(35) Bill's story about Sue may be amazing, but Max's is virtually incredible.

Max's in (35) is generally assumed to be derived from the intermediate form *Max's one*, and with good reason; it fills the gap in the paradigm for *one*-pronominalization:

- (36) a. I like Bill's yellow shirt, but not $\left\{ \begin{array}{l} \text{Max's red one.} \\ * \text{Max's red.} \end{array} \right\}$
 b. I like Bill's yellow shirt, but not $\left\{ \begin{array}{l} * \text{Max's one.} \\ \text{Max's.} \end{array} \right\}$

(36) can be neatly accounted for if there is a rule that deletes *one(s)* when it is adjacent to the determiner.

Unfortunately, as the papers mentioned above point out, there is a serious difficulty with this derivation. *Max's* can stand alone when its antecedent is a mass noun phrase:

(37) I like Bill's wine, but Max's is even better.

This is clearly the same construction as (35); the grammar would be missing a generalization if it did not assign them parallel derivations. But since there is no indefinite pronoun in English for mass nouns,

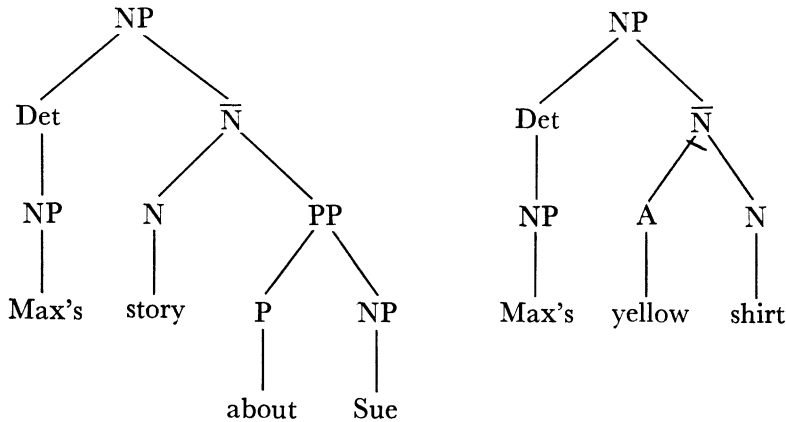
(38) *I like Bill's new wine, but Max's old (stuff?) is even better.

there is no paradigm like (36) which can motivate an intermediate pronominalization step in the derivation of (37).

One way out would be to posit a hypothetical indefinite mass pronoun, which would be required to undergo a deletion rule. Such lexical items have been proposed extensively in recent literature. However, the free use of this device constitutes a powerful extension of linguistic theory; one should try as hard as possible to eliminate the need for it in each individual case. In this particular construction, in fact, the use of a hypothetical lexical item is patently a brute-force attempt to preserve an alleged generalization.

Alternatively, we could interpret the need for a hypothetical lexical item as counterevidence to the generalization. Under this approach, we would give up the claim that *Max's* is a reduction of *Max's one* in (35)–(36), and instead state a deletion rule which produces *Max's* directly from the forms *Max's story about Sue* and *Max's yellow shirt*. Assuming the NP structure suggested in Chomsky (1967), with a node \bar{N} , and assuming that adjectives are dominated by \bar{N} ,

(39)



the rule could simply delete \bar{N} under conditions of identity with some other \bar{N} . An \bar{N} -Deletion rule would automatically account for the occurrence of *Max's* in (37) without the need for an intermediate form involving a hypothetical pronoun. Instead of the two rules *one*-pronominalization and *one*-deletion, then, we will have a more restricted version of *one*-pronominalization and a totally independent \bar{N} -deletion. We are giving up the apparent generalization about the paradigm (36); but since we are interpreting (37)–(38) as a counterexample to the generalization, this move is not without merit. More evidence will appear shortly.

Return to (34). Let us (with malice aforethought) call the rule deriving these sentences \bar{N} -Gapping. Like \bar{N} -Deletion, it must delete adjectives preceding the head noun; otherwise *one(s)* appears. Thus the gap in (40a) is *funny story*, not just *story*; (40b), with unlike adjectives, is unacceptable; (40c), with *one*, is all right:

- (40) a. Bill's funny story about Sue and Max's about Kathy both amazed me.
 b. *Bill's funny story about Sue and Max's boring about Kathy both amazed me.
 c. Bill's funny story about Sue and Max's boring one about Kathy both amazed me.

\bar{N} -Gapping can also delete mass nouns, making the rule difficult to state as a pronoun deletion rule:

- (41) Bill's wine from France and Ted's from California cannot be compared.

\bar{N} -Gapping need not simply delete the head noun and preceding adjectives. The gap can include a PP to the right of the head, preferably adjacent to the head, but not necessarily:

- (42) a. Szell's recording of Beethoven's 6th on Columbia and Klemperer's on Angel both have the wrong tempo in the third movement.

- b. ?I was astounded by Sam's stunning defeat of Ira in the chess tournament and Walt's of Willy.

With a PP and a *that*-clause in the complement, either may delete:

- (43) a. ?We may safely disregard both Nixon's assurances to us that the war will end and Thieu's to South Vietnam.
 b. We may safely disregard both Nixon's assurances to us that the war will end and Agnew's that we are effete.

With a PP and infinitive following the noun, the infinitive can delete, but the PP cannot:

- (44) a. ?As a teacher, you have to deal simultaneously with the administration's pressure on you to succeed, and the parents' on their children.
 b. *As a teacher, you have to deal simultaneously with the administration's pressure on you to succeed, and the children's to be a nice guy.

If there are two unlike PPs following the head noun, \bar{N} -Gapping is marginal:

- (45) a. ?*Ormandy's recording of Ives' 1st on Columbia and Von Karajan's of Mozart's 40th on Angel can be recommended none too highly.
 b. ?*I was astounded by Sam's stunning defeat of Ira in the chess tournament (,) and (by) Walt's of Willy in the hopscotch contest.

I have been treating \bar{N} -Deletion and \bar{N} -Gapping as two separate rules. From what has been said so far, they appear to generalize into a single rule deleting either the entire \bar{N} or all but one constituent of \bar{N} . However, further investigation reveals this generalization to be less plausible: the rules differ in the relations they permit between the two noun phrases involved. \bar{N} -Gapping is most felicitous when the two noun phrases are joined by *and*, *either-or*, or *neither-nor*:

- (46) a. Either Ted's gin from New Jersey or Bill's from Iowa will satisfy the uneducated palates of our guests.
 b. Neither Szell's recording of Beethoven's 6th on Columbia nor Klemperer's on Angel has the right tempo.

It is a good deal worse when the noun phrases are more distantly related, although exaggerated intonation sometimes helps:

- (47) a. ?*Tureck's performance of Bach on the piano doesn't please me anywhere as much as Landowska's on the harpsichord.
 b. *Tom's dog with one eye attacked Frank's with three legs.
 c. *I borrowed Fred's diagram of a snake's fang because Steve's of a spider's eye had been stolen.

\bar{N} -Gapping certainly cannot take place when the gapped NP precedes its antecedent, even if it is in a subordinate clause:

- (48) a. *Anyone who likes Landowska's on the harpsichord should listen to Tureck's version of the *Well-Tempered Clavier* on the piano.
 b. *Because Steve's of a spider's eye had been stolen, I borrowed Fred's diagram of a snake's fang.

By contrast, a full \bar{N} can be deleted in a much wider range of environments. If the two NPs are conjoined by *and* the result has a somewhat archaic flavor:

- (49) ?I like Bill's yellow shirt and Max's.

Either-or and *neither-nor* conjunction are satisfactory:

- (50) a. Either Ted's gin from New Jersey or Bill's will satisfy the uneducated palates of our guests.
 b. Neither Szell's recording of Beethoven's 6th on Columbia nor Klemperer's has the right tempo.

With more distant antecedents, \bar{N} -Deletion is still often acceptable:

- (51) a. Tureck's performance of Bach on the piano doesn't please me as much as Glenn Gould's.
 b. Tom's dog with one eye attacked Fred's.
 c. I borrowed Fred's diagram of a snake's eye because Steve's had been stolen.

Finally, the deleted \bar{N} , if in a subordinate clause, may often be to the left of its antecedent without disturbing acceptability too profoundly:

- (52) ?Because Steve's had been stolen, I borrowed Fred's diagram of a snake's eye.

Thus we conclude that \bar{N} -Gapping and \bar{N} -Deletion do not generalize completely.

In fact, a much more striking generalization lurks in the data. Compare Gapping to \bar{N} -Gapping, and VP-Deletion to \bar{N} -Deletion. Both Gapping and \bar{N} -Gapping delete the head of a phrase, all the material to the left of the head, and all but one constituent to the right of the head. Both have the (unexplained) condition that the constituent remaining may not be an infinitive if there is a preceding NP or PP. Furthermore, both are at their best when the antecedent is connected to the gapped phrase by *and*, *or*, or *nor*. (Since NPs do not conjoin with *but*, (5) is not a counterinstance to the generalization.)

On the other hand, both VP-Deletion and \bar{N} -Deletion delete the head of a phrase and everything to the right of it. VP-Deletion leaves the auxiliary behind, but no adverbs between the auxiliary and the head. Since there is nothing in a noun phrase corresponding to the auxiliary, the fact that adjectives to the left of the head must delete under \bar{N} -Deletion constitutes the proper generalization. Finally, VP-Deletion and \bar{N} Deletion operate in a wide variety of contexts, including backwards into subordinate clauses.

It is clear that the similarities between Gapping and \bar{N} -Gapping and between VP-Deletion and \bar{N} -Deletion are far more thorough than the similarities between the two \bar{N} rules or between the two VP rules, since they extend to all aspects of the structural description and structural change. In fact, if we accept \bar{N} -Deletion as an NP counterpart of VP-Deletion, we see that the apparent generalization of the \bar{N} rules is illusory; the absence of anything in NPs corresponding to the auxiliary merely makes the rules harder to distinguish than the two VP rules, which can be separated clearly by reference to the auxiliary.

How can these generalizations be captured in the grammar? They certainly cannot be expressed by having VP-Gapping and VP-Deletion precede a nominalizing transformation, since \bar{N} -Gapping and \bar{N} -Deletion can take place with head nouns such as *dog* and *wine* and with determiners such as *two* and *another*, none of which can be the result of the usual nominalizing transformations. Nor would one want to suggest that noun phrases are some special kind of sentence (or vice versa), since the differences between sentences and noun phrases are all too apparent. What is needed is a mechanism which allows us to treat sentences and noun phrases alike with respect to some rules and differently with respect to others.

One such mechanism is given by the theory that syntactic nodes are to be represented as matrices of distinctive features, proposed in Chomsky (1967). In this theory, the major categories N and V are taken to share a feature, say $[+F_1]$; but N is $[+F_2]$ and V is $[-F_2]$. Adjectives, adverbs, prepositions, and conjunctions are all $[-F_1]$; I will not speculate here on their other features. The nodes \bar{N} and NP over N also carry the partial feature matrix $[+F_1, +F_2]$, and the nodes VP and S^4 over V carry the

features $[+F_1, -F_2]$. Thus there are two configurations of nodes, VP and \bar{N} , which

S	NP
VP	\bar{N}
V	N

are claimed to behave similarly with respect to some rules of the grammar (those which leave F_2 unspecified), but differently with respect to other rules (those which mention a particular value of F_2). Chomsky shows that the passive transformation generalizes to derived nominal constructions, and that this generalization can be captured by leaving the feature F_2 unspecified.

Of course, many rules must refer to a particular value of F_2 . For example, $[-F_2]$ is mentioned in the base rule for the auxiliary, the dative shift transformation, and the subject raising transformation. $[+F_2]$ is mentioned in the base rule that generates articles and quantifiers, the transformation inserting 's after pronominal

⁴ Actually, it is not settled whether S is the counterpart of NP in this system, or whether there is a node \bar{V} and possibly more intervening between VP and S. In Jackendoff (1968a) I argue that the notion of *subject* and the corresponding projection rules generalize best if S does correspond to NP. On the other hand, Dougherty (1968) makes extensive use of intervening \bar{V} and \bar{V} nodes.

NPs, and the transformation inserting *of* before postnominal NPs (as in *the defeat of Germany*).

On the other hand, a number of rules besides the passive can take advantage of the feature mechanism. For example, the rule deleting complement subjects (Equi-NP Deletion) takes place in both Ss and NPs:

- (53) a. Jerry attempted to blow up the Pentagon.
 b. Jerry's attempt to blow up the Pentagon

The generalization in (53) has traditionally been expressed by deriving (53b) from (53a), using a nominalizing transformation. However, the use of syntactic distinctive features suggests another way: in the structural description of the deletion rule, the feature $[-F_2]$ on the matrix clause can simply be removed, and deletion in (53b) will follow automatically.

A less well-known case is noted by Bowers (1968), who points out the striking similarity of the constructions in (54):

- (54) a. So fast did he run that nobody could catch him.
 b. so tall a man that nobody could reach his nose.

The generalization cannot be captured by ordering the transformations producing these constructions before a nominalizing transformation, since *man* in (54b) is hardly a nominalization. Hence the rules preposing *so* $\begin{Bmatrix} Adj \\ Adv \end{Bmatrix}$ can only be generalized by using features. The α notation for phonological rules seems appropriate for this case: it can be used to correlate the feature distinguishing nouns from verbs with the features distinguishing adjectives from adverbs.⁵

Finally, the feature notation gives us a way to make the proper generalization of the Gapping and Deletion rules discussed here. The four rules can be collapsed into two, X -Gapping and X -Deletion, by leaving the feature F_2 unspecified in the structural descriptions of the rules (where X is the complex of features shared by VP and \bar{N} , including $[+F_1]$). It is of course necessary to make provision for the fact that these rules delete preverbal adverbs in sentences but prenominal adjectives in NPs. But

⁵ Assuming adjectives are $[-F_1, +F_3]$, and adverbs are $[-F_1, -F_3]$ (where F_3 may or may not be distinct from F_2), the rule would have roughly the following form:

$$\begin{array}{c} \begin{array}{c} \overline{[+F_1]} \\ \overline{[\alpha F_2]} \end{array} X - \begin{array}{c} \overline{[-F_1]} \\ \overline{[\alpha F_3]} \end{array} \text{ so } - \begin{array}{c} \overline{[-F_1]} \\ \overline{[\alpha F_3]} \end{array} \text{ that } - S \end{array} \implies 2 + 1 - 3$$

$\underbrace{\hspace{10em}}_1 \quad \underbrace{\hspace{10em}}_2 \quad \underbrace{\hspace{10em}}_3$

Following the bar notation of Chomsky (1967), $\overline{[+F_1]}$ denotes NP in this rule, $\overline{[+F_1]}$ denotes S, $\overline{[-F_1]}$ denotes AP, and $\overline{[-F_3]}$ denotes AdvP. What is relevant to the present discussion is of course the use of features in the rule, not the actual mechanics. Note that subject-aux inversion in (54a) can be made a natural consequence of the preposed *so Adv*.

since English has no prenominal adverbs or preverbal adjectives, it is possible to handle this problem simply by leaving the feature distinguishing adjectives from adverbs also unspecified in the deletion condition. Notice that since the generality of the Gapping and Deletion rules cannot be expressed with traditional syntactic formalism, they are strong evidence for the theory of syntactic distinctive features.⁶

The generalization of the Gapping and Deletion rules across the categories NP and S also constitutes a second argument in favor of the analysis of \bar{N} constructions like (35) in terms of direct deletion, and against an analysis involving an intermediate stage of *one(s)* pronominalization. This leaves the problem of accounting for the difference between *Bill's big one* and **Bill's one*. There are a number of conceivable ways to do this. I will suggest two.

First, note that with the assumption of \bar{N} -Deletion and \bar{N} -Gapping rules, the range of environments for *one*-pronominalization is considerably reduced. Not only the obvious cases (34–36) are affected. Let us assume Perlmutter's (1968) account of the indefinite article, in which *a* is a reduced form of the numeral *one*, occurring only in unstressed proclitic position. Then consider sentences such as (55):

(55) Bill bought a (red) house, and Max bought one too.

(55) can be derived by applying \bar{N} -Deletion in the second clause, deleting, as we would expect, (*red*) *house*. Then, since *one* is not functioning as a proclitic, it does not reduce to *a* as it does in the first clause. Thus, what have been taken to be the paradigm cases of *one*-pronominalization can be handled by other rules. This leaves only the cases where an adjective precedes *one*, such as *a blue one*, *Max's revolting one*. To get these, we could simply restrict *one*-pronominalization to environments with an adjective present; or we could leave *one*-pronominalization more general and add a *one*-deletion transformation like Perlmutter's to eliminate the cases without adjectives. I do not have any evidence to decide between these approaches, although the former sounds somewhat simpler. Perhaps some more interesting solution will be found.

References

- Bierwisch, M. and K. E. Heidolph, eds. (to appear) *Recent Developments in Linguistics*, Mouton, The Hague.
- Bowers, J. (1968) "Adjectives and Adverbs in English," Indiana University Linguistics Club, Bloomington, Indiana.
- Chomsky, N. (1967) "Remarks on Nominalization," in R. Jacobs and P. Rosenbaum (to appear).

⁶ For other work which crucially uses the notion of syntactic nodes as distinctive feature matrices, see Dougherty (1968) and Jackendoff (1968a, 1968c, 1969a). Further evidence for this view exists in the literature, but under a rather different interpretation. The arguments that adjectives are deep structure verbs (Lakoff 1965) and that adjectives are dominated by NPs in deep structure (Ross 1969) can instead be taken to show that adjectives share features with both nouns and verbs. Likewise, the widespread idea that prepositional phrases are nothing but some peculiar kind of noun phrase (argued, for example, in Postal 1968) may well be interpretable as a sharing of syntactic features.

- Dingwall, W. O. (1969) "Secondary Conjunction and Universal Grammar," *Papers in Linguistics* 1, 207-230.
- Dougherty, R. C. (1968) *A Transformational Grammar of Coordinate Conjoined Structures*, unpublished Doctoral dissertation, MIT.
- Jacobs, R. A. and P. S. Rosenbaum, eds. (to appear) *Readings in English Transformational Grammar*, Blaisdell-Ginn, Waltham, Mass.
- Jackendoff, R. S. (1968a) "Speculations on Presentences and Determiners," Indiana University Linguistics Club, Bloomington, Indiana.
- Jackendoff, R. S. (1968b) "Quantifiers in English," *Foundations of Language* 4, 422-442.
- Jackendoff, R. S. (1968c) "An Interpretive Theory of Pronouns and Reflexives," Indiana University Linguistics Club, Bloomington, Indiana.
- Jackendoff, R. S. (1969a) *Some Rules of Semantic Interpretation for English*, unpublished Doctoral dissertation, MIT.
- Jackendoff, R. S. (1969b) "Les constructions possessive en anglais," *Langages* 14, 7-27.
- Klima, E. S. (1964) "Negation in English," in J. Fodor and J. J. Katz, eds., *The Structure of Language*, Prentice-Hall, Englewood Cliffs, N.J.
- Lakoff, G. (1965) *On the Nature of Syntactic Irregularity*, in *Mathematical Linguistics and Automatic Translation, Report No. NSF-16*, the Computation Laboratory of Harvard University, Cambridge, Mass.
- Langacker, R. (1969) "Mirror Image Rules I: Syntax," *Language* 45, 575-598.
- Perlmutter, D. (1968) "On the Article in English," in M. Bierwisch and K. E. Heidolph (to appear).
- Postal, P. M. (1968) "Cross-Over Phenomena," in *Specification and Utilization of a Transformational Grammar (Scientific Report No. 3)*, IBM Watson Research Center, Yorktown Heights, N.Y.
- Ross, J. R. (1967a) "Gapping and the Order of Constituents," in M. Bierwisch and K. E. Heidolph (to appear).
- Ross, J. R. (1967b) *Constraints on Variables in Syntax*, Indiana University Linguistics Club, Bloomington, Indiana.
- Ross, J. R. (1967c) "Auxiliaries as Main Verbs," unpublished paper, MIT.
- Ross, J. R. (1969) "Adjectives as Noun Phrases," in D. A. Reibel and S. A. Schane, eds., *Modern Studies in English*, Prentice-Hall, Englewood Cliffs, N.J.

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