Guess Who?
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0. I will be concerned in this paper with describing the operation of a rule which I will refer to as Sluicing. This rule converts sentences like those in (1) to the corresponding sentences in (2).

(1) a. Somebody just left -- guess who just left.

b. Ralph is going to invite somebody from Kankakee to the party, but they don't know who he's going to invite to the party.

c. He is writing (something), but you can't imagine { what / where / why / how (fast) / { to / with / for / etc. } whom } he is writing.

(2) a. Somebody just left -- guess who.

b. Ralph is going to invite somebody from Kankakee to the party, but they don't know who.

c. He is writing something, but you can't imagine { what / where / why / how (fast) / { to / with / for / etc. } whom }

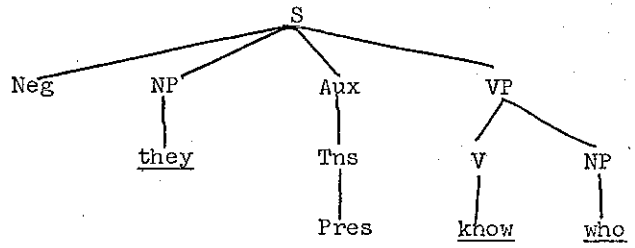
This rule has the effect of deleting everything but the preposed constituent of an embedded question, under the condition that the remainder of the question is identical to some other part of the sentence, or of a preceding sentence.

In §1, I will present three arguments to the effect that the sentences in (1) and (2) must be related, and that the sentences in (2) are less basic than those in (1) -- that in fact the remainders of the embedded questions in (1) must be "sluiced" to produce the sentences in (2). In §2, I will argue that the rule in question must apply after the rule of Question Formation has preposed the various "question-words" to the beginning of the embedded clauses in (1). Finally, in §3, I will discuss briefly the other, broader implications for the theory of language which will follow from the adoption of Sluicing as a grammatical deletion transformation.

§1.
§1.1.
§1.1.1 In this section, I will argue against a man that is presently made of straw, since no other grammarian, to the best

of my knowledge, has discussed such sentences as those in (2) in detail. No one, therefore, has yet proposed an alternative analysis which runs directly counter to the derivation I have suggested -- that the sentences of (2) result from the application of a rule of deletion to the sentences of (1). However, recent work, by Akmajian, Chomsky, Dougherty, Jackendoff, and others[1], has suggested the logical possibility of a different source for the second clauses of the sentences of (2) -- namely, essentially their surface structures. That is, it might be argued that the second clause of (2b) should be derived not directly from the second clause of (1b), but rather from the approximate structure shown in (3).

(3)



The fact that (2b) is synonymous with (1b) would, in such an analysis, not be accounted for by deriving both from the same deep structure, which is the account of this fact that I would give, but rather by proposing an interpretive semantic rule, which would inspect the structures in the environment of (3) and determine that the NP who must bear the grammatical relation of object to the verb invite. Let me refer, in the following discussion, to any theory of the sentences in (2) which does not analyze the question-words there as being the last remnants of full question clauses as an "interpretive" theory.

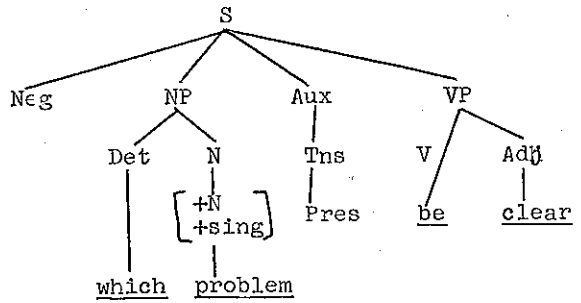
1.1. The first argument against an interpretive theory of the facts of (2) was suggested by facts pointed out to me by George Williams. He observed that in German, where sentences paralleling those in (2) are to be found, the question-word must, under certain conditions, agree in case with some NP in a preceding clause. Thus in (4), only wem (dative) "whom" is possible, because the verb schmeicheln "to flatter" takes only dative objects.

(4) Er will | jemandem (dat.) | schmeicheln, aber sie wissen nicht { *wen / wem }
He wants to | someone | flatter but they know not whom

"He wants to flatter somebody, but they don't know who."

An interpretive theory would postulate, as the deep structure of the second clause of (10), the structure in (11).

(11)



But what of such sentences as (12)?

(12) He's going to give us some old problems for the test, but which problems isn't clear.

The importance of this sentence, as far as any interpretive theory is concerned, is of course the fact that it manifests singular number agreement, despite the fact that its subject is superficially plural. Since the deep structure of the second clause of (12), under such a view, would be identical to (11), except that [-sing] would replace [+sing], two problems will arise. First of all, some way must be found to distinguish between the second clause of (12) and the unrelated, though superficially highly similar (13), which manifests plural number agreement.

(13) Which problems aren't clear and easy to do?

Secondly, it is not sufficient for the interpretive rule to look at (12) and determine that the NP which problems must bear the grammatical relation of direct object to the verb give: in addition, it must somehow provide an output that the rule of Number Agreement can apply to to yield the desired singular form of the verb. I can see only two possibilities for this, neither of them being very palatable.

The first is for the interpretive rule to mark any question-word it operates on with some ad hoc feature, and to state the rule of Number Agreement in such a way as to make reference to this ad hoc feature and to treat any NP bearing this feature as a singular NP, irrespective of the value of the feature [± singular] which the NP bears.

The major defect in this proposal should be obvious: it makes

accidental the fact that the Number Agreement rule chooses to interpret the ad hoc feature as singular, instead of plural. But this fact should follow automatically, in any correct analysis, from the fact that complement sentences generally behave like singular NP's, as the sentences in (14) attest.

(14) a. That Bill left {is / *are} tragic.

b. Why he did it {is / *are} a puzzle.

c. Being drunk {gives / *give} me a kick.

The second possible way of accounting for the singular agreement in (12) would be, for the interpretive rule not to merely plug in (somehow) which problems as the direct object of give in the left helf of (12), but for it to reconstruct, by the inverse operation of Sluicing, in effect, an embedded question in subject position in the right-hand clause of (12). The rule of Number Agreement could then be stated in a general form, but a major new problem would have arisen: what to do with this new subject, from a semantic point of view? If it must be interpreted, then, since it can be of any desired degree of transformational complexity, interpretive rules which undo the effects of virtually all transformations will have to be added to the semantic component, as far as I can see. It may be, of course, that I have not been able to imagine a resourceful enough interpretivist as a straw man, but I would be surprised if the twin difficulties posed by sentence (12) and by sentence (13) could be satisfactorily overcome within an interpretive theory.

1.1.3. A third argument that what is involved in the generation of such sentences as those in (2) is a deletion transformation, and not an interpretive rule, is provided by such sentences as those in (15).

(15) a. She says she's inviting some men -- I wonder how many men?

b. *I wonder {those old men / the centerfielder for the Cardiac Kids / your uncle Casimir}

If phrase structure rules are to generate as a well-formed deep structure the second clause of (15a), I can see no natural way of preventing the same phrase structure rules from generating the ungrammatical strings of (15b). Therefore, any linguist wishing to maintain an interpretive theory hare will be forced to give up a rather natural characterization of the possible objects of the verb wonder -- namely, that this

In (5), by contrast, only wen (accusative) "whom" is possible, because the verb loben "to praise" takes only accusative objects.

(5) Er will jemanden loben, aber sie wissen nicht {*wem / wen}.
"He wants to praise someone (acc.), but they don't know who."

Similar facts can be adduced for that dialect of English which distinguishes between who and whom. For this dialect, whom would appear in (1b) and (2b), but who in (6).

(6) a. Somebody from Kankakee is going to be invited to the party by Ralph, but they don't know {*whom / who} is going to be invited to the party by Ralph.

b. Somebody from Kankakee is going to be invited to the party by Ralph, but they don't know {*whom / who}.

Excluding for the moment the facts of (2b) and (6b), the English rule of Case Marking would seem to be approximately that stated in (7).[2]

(7) Case Marking [3]

X - NP - Y

1 2 3 ⟹ (OBL)

1 [2] 3
+objective

Condition: 2 is not dominated immediately by S.[4,5]

But now observe that the facts of (2b) and (6b) cause grave difficulties with respect to Case Marking, for an interpretive theory, at least. For in such a theory, the deep structure of the second clause of (2b) is identical to the surface structure of the second clause of (2b), namely (3). How can such a theory account for the fact that rule (7) must apply to (3) in (2b) (and, to complicate matters, in the derivation of (8)),

(8) Whom don't they know?

but not in the derivation of (6b)?

At least part of the answer to this question is evident:

rule (7) would have to apply to the output of the interpretive semantic rule, That is, whether or not who or whom was appropriate could not be established until the interpretive rule had determined how the question-word functioned in the preceding clause.

But now note that the output of the interpretive rule cannot be the semantic representation itself, for the question-word is a semantic direct object of invite, regardless of whether it shows up in the nominative or in the objective case. Thus the interpretive rule must produce an output structure which is in the form aof a passive, for it is only to such a structure that Case Marking can be correctly applied.

Unfortunately, however, if the output of the first interpretive semantic rule has the form of a passive, then a second interpretive rule, Anti-Passive, will be necessary to convert this intermediate form to its active form, so that other interpretive semantic rules will be able to apply to the output of Anti-Passive in the desired fashion. I am doubtful that the prospect of postulating a grammatical rule of Passive and a semantic rule of Anti-Passive, or, alternatively, of only postulating the latter rule, and of generating passives as deep structures, would be embraced with relish by any interpretivist. And, of course, this argument generalizes easily. For example, if there is a rule of Tough Movement,[6] which converts (9a) into (9b),

(9) a. It was tough to get the marbles away from one of your kid sisters.

b. One of your kid sisters was tough to get the marbles away from.

then the fact that guess whom? can follow (9a), but not (9b), indicates the need for an interpretive rule of Anti-Tpugh Movement. In fact, if any interpretive theory of the sentences in (2) is correct, either there are no transformational rules which produce derived subjects, or for each such rule there is an equal and opposite interpretive rule which reverses its effects, after Case Marking has applied.

To be sure, no interpretive theory of the sentences in (2) exists, so I may be beating a dead horse, but I think it is perhaps of some value to catalog the additional assumptions that ppoponents of any such theory would have to make.

1.1.2. Consider next such sentences as those in (10).

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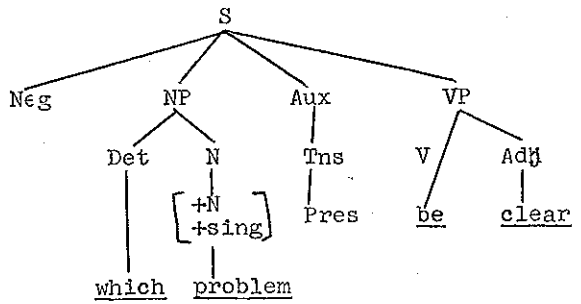

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verb must be followed in deep structure by an embedded question,[7] a restriction which correctly excludes the non-sentences of (15b). Instead, such a linguist, in order to generate the second clause of (15a), will have to generate the sentences of (15b) as syntactically well-formed, but semantically anomalous.

But, it might be countered, selectional violations are indeed semantic violations,[8] so there is nothing wrong with this claim. Unfortunately, however, the linguist willing to give up this bath-water will also have to jettison the baby, for he will not only have to claim that (16a) and (16b) are both syntactically well-formed, the latter being semantically deviant, but also that (16c) is syntactically well-formed, and only semantically deviant.

(16) a. I polished my tongue.
b. *I polished my liberty.
c. *I polished valid.

To see why this is so, consider the sentences in (17).

(17) a. He says that her objections are valid, but I wonder how valid?
b. *I wonder valid.

Since in all sets of phrase structure rules proposed to date, adverbs of degree (and how in (17a) is one) are optional constituents of adjective phrases, there is no non-ad hoc way of allowing the second clause of (17a) as a well-formed deep structure, but excluding (17b). Thus one advocating an interpretive theory must abandon the claim made in Chomsky (1965) that while choosing incorrect subcategories of the same lexical category cannot lead to ungrammaticality, in general (Cf. Chomsky (1965), Chapter 2, for a more precise exposition of this claim), choosing incorrect lexical categories always results in ungrammatical strings.

It is not my purpose here to argue for or against Chomsky's claim. I regard the issues as open (cf. Lakoff and Ross (in preparation) for further discussion). Rather, I merely wish to point out that anyone wishing to maintain an interpretive theory of the sentences in (2) must reject Chomsky's claim, and defend the claim that all the sentences in (18) are only semantically deviant.

(18) a. I wonder valid.
b. Hoarse wonder valid.
c. Hoarse obscure valid.

1.2. Let us now consider the sentences in (19) and (20), which would also pose serious problems for an interpretive theory in which the second clause of (2b) is derived from (3).

(19) a. We know that he was eating, but what isn't clear.
b. We know that he was eating, but with whom isn't clear.
c. We know that he was eating, but how rapidly isn't clear.

(20) a. We know that he was eating, but it isn't clear what.
b. We know that he was eating, but it isn't clear with whom.
c. We know that he was eating, but it isn't clear how rapidly.

Intuitively, it is obvious that the second clauses of (20) should be derived from the corresponding second clauses of (19) by the rule of Extraposition, which I have stated approximately in (21). (Cf. Rosenbaum (1967) and Ross (1967), Ch. 5, for discussion of this rule).

(21) Extraposition

X - [it - S] - Y

1 2 3 4 $\xrightarrow{\text{OPT}}$

1 2 0 4 + 3

Condition: 3 ≠ Poss NP Ing X

However, if the deep structures of the second clauses of (19) parallel (11), in which there is no NP of the form $[\text{it S}]_{NP}$, obviously Extraposition will not be able to apply to (19), unless the structural description of this rule is complicated in some ad hoc way, so that the rule will not only extrapose a sentence following an it, but also a question-word, where this latter branch of the rule will also have to insert the pronoun it under the NP which used to dominate the question-word.

Unfortunately, the difficulties in accounting for the sentences of (20) under an interpretive theory will still not be avoided, even with this ad hoc complication of Extraposition. For because the question-words which remain after Sluicing applies can be homophonous with question-words which did not appear as constituents of embedded clauses (thus the second clause of (10) is ambiguous), the extended rule of Extraposition would have to be restricted in some way from converting (22a), whose subject

cannot be interpreted as a constituent of an embedded question (cf. the ungrammaticality of (23)), into the ungrammatical (22b).

(22) a. Who is hoarse?

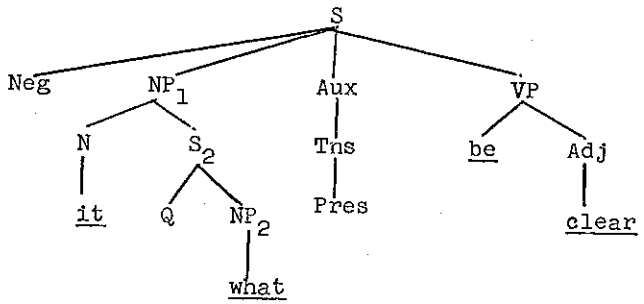
b. *It is hoarse who?

(23) * { Who left / Why he did it / How long the stew cooked / Whether the moon's a balloon } is hoarse.

Thus, a condition would have to be placed on the extended rule of Extraposition which restricted the extraposing of question-words to those sentences whose main verb or adjective allowed embedded questions in deep structure, an obviously ad hoc and repetitious "solution" to the problem posed by (20).

Confronted with such a problem, one wishing to deny the existence of a rule of Sluicing, and to maintain a version of an interpretive theory, might propose (24) as the deep structure of the second clause of (19a).

(24)



To this structure, the rule of Expraposition stated in (21) could apply, without ad hoc extensions being necessary. An additional advantage of (24) is that the problem of getting singular number agreement in sentences like (12) would be solved. The node NP_1 in (24) would determine number agreement, and it would be singular by virtue of the generalization underlying (14). It would probably also be possible to avoid the arguments in §1.1.3 above, which derived from the deviance of such sentences as those in (15b), (16b), (16c), and (18), for an interpretivist could require that every constituent appearing in place of NP_2 in (24) would have to be a question-word.

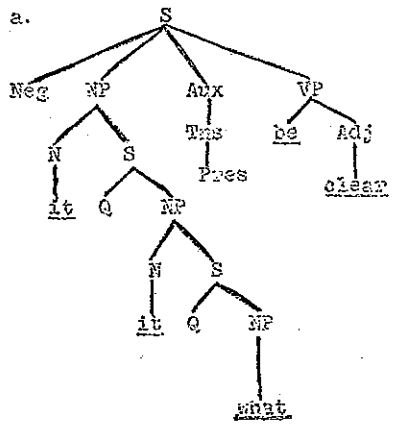
The argument in §1.1.1, however, is still valid, as far as I can see: the impossibility of whom in (6b) could not be accounted for with the general rule of Case Marking which is given in (7). In addition, the deep structure shown in (24), which implies the existence of a phrase structure rule like that shown in (25),

(25) a. $S \rightarrow$ { Q NP / it ___ }

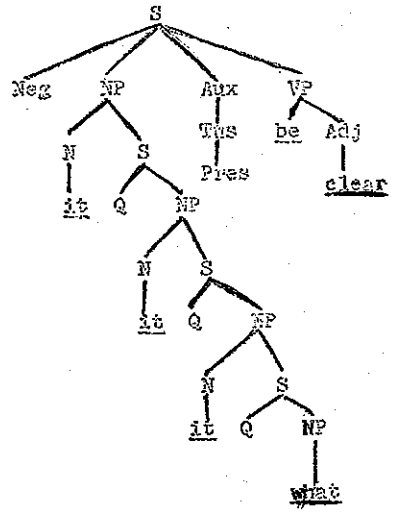
b. $S \rightarrow$ { (Q / Imp) (Neg) NP Aux VP }

raises additional problems, for the rule in (25a) can be iterated. Thus the second clause in (19a) could be derived from (24), or from (26a), or from (26b).

(26) a.



b.



In fact, every sentence containing a sluiced question would be derivable from an infinite number of distinct deep structures. This undesirable result could only be avoided by some ad hoc restriction which prohibited such deep structures as those in (26). The adhocness of any such restriction, coupled with the fact that the argument in §1.1.1 appears to remain valid, indicates that (24) cannot be regarded as a viable alternative to an analysis incorporating a transformational rule of Sluicing. In addition, the arguments to be given in §2 below, which suggest that Sluicing

must be ordered after the rule of Question Formation, pose equally grave problems for an interpretive theory, whether based on (3) or on (24).

2. The three phenomena that I will discuss in this section are not only further arguments for the existence of a transformational rule of Sluicing -- they also constitute evidence that the rule of Sluicing must follow the rule of Question Formation.

2.1. Consider first the sentences in (27).

(27) I know he has { a picture of somebody, but I don't know { who / of whom / *a picture of whom } / somebody's picture, but I don't know whose picture }

An interpretive theory must treat the fact that NP's like who, of whom[9], and whose picture may appear as the deep objects of verbs like know, wonder, guess, etc., while the NP a picture of whom may not, as an accidental fact. However, an analysis which derives the sentences in (2) from those in (1) by a deletion rule can make use of the fact that precisely the same set of NP's can appear at the head of embedded questions, as (28) shows.

(28) I don't know { who he has a picture of / of whom he has a picture / *a picture of whom he has / whose picture he has }

However, the facts of (27) and (28) do not merely support the derivation of the sentences in (2) by a deletion rule, as opposed to an interpretive rule. In addition, they argue strongly against a third logically possible source for such sentences. That is, it might be argued that (2b), for instance, derives not from (1b), but rather from (29), a stage derivationally prior to (1b).

(29) Ralph is going to invite somebody from Kankakee to the party, but they don't know $_S[$Q Ralph is going to invite WH + somebody to the party$]_S$.

The rule effecting this conversion might be stated somewhat as in (30).

(30) Z_1 - [X - NP - Y]$_S$ - Z_2 - [Q - X - NP - Y]$_S$ - Z_3

1 2 3 4 5 6 7 8 9 10

OPT ⇒

1 2 3 4 5 0 0 8 0 10

Condition: 2 = 7, 4 = 9, 8 > WH + some

In applying this rule to the structures underlying the sentences of (27), the variables in terms 2 and 4 could be chosen in such a way as to make the NP of term 3 be somebody, of somebody, a picture of somebody, or somebody's picture. Since the third of these choices of variables would lead to the ungrammatical sentence in (27), some further adhoc restriction would have to be imposed upon rule (30).

While I do not wish to argue that (30) is basically incorrect, it does seem to me that it should be reformulated to follow the rule of Question Formation, which can be stated in a preliminary fashion as in (31), for reasons which will appear shortly.

(31) Q - X - NP - Y

1 2 3 4

OBLIG ⇒

3 2 0 4

Condition: 3 = WH + some + X

As was discussed in detail in Ross (1967), §4.3, by the universal convention of Pied Piping, when some NP which is mentioned in the structural description of a rule is flanked by variables, if the structural change of the rule specifies that this NP is to be reordered, then, when carrying out this reordering, either the mentioned NP or any higher NP meeting certain additional conditions can be moved. If it is a higher NP that moves, the constituents of this NP are said to "pied pipe" with the movement of the mentioned NP. Thus although the mentioned NP in Question Formation is the one that starts with WH (i.e., who(m)), by Pied Piping, the higher NP $_{NP}[$ of$_{NP}[$whom$]_{NP}]_{NP}$ may instead be preposed.

Exactly what types of constituents may pied pipe varies from language to language, from rule to rule, and even from dialect to dialect. In particular, while it is possible to

pied pipe NP's of the form a picture of whom in forming relative clauses, as (32c) shows,

(32) a. J. Edgar Hoover, who I have a picture of in my locket, is a cutie.

b. J. Edgar Hoover, of whom I have a picture in my locket, is a cutie.

c. J. Edgar Hoover, a picture of whom I have in my locket, is a cutie.

this type of NP must be prevented from pied piping in the rule of Question Formation, as the ungrammatical sentence of (28) shows.[10]

The conclusion is obvious: if the rule of Sluicing, appropriately revised, follows the rule of Question Formation, then the ad hoc restriction on this latter rule which prevents the pied piping of NP's like a picture of whom need not be repeated, as would be the case if the reverse ordering obtained. Therefore, I claim, the sentences in (2) are to be derived by a deletion transformation, not from such more basic strings as that in (29), but rather from such strings as those in (1), which are the output of the rule of Question Formation.

2.2. A second argument for this ordering can be derived from the following considerations. Normally, the pied piping of a preposition, when its NP object is questioned, is optional, as the variants in (27) suggest. However, there are conditions under which prepositions may not pied pipe, and must be stranded by any rule which moves the NP which follows the preposition (cf. Ross (1967), §4.3 for some discussion of this phenomenon). Thus, in my speech (there is much dialectal variation with respect to these facts), while the a - sentences in (33) - (35) are grammatical, the b - sentences, in which the prepositions have pied piped, are not.

(33) a. Who are you going to do away with?

b. *With whom are you going to do away?

(34) a. What will we have to make do with?

b. *With what will we have to make do?

(35) a. Which plot did the FBI get wind of first?

b. *Of which plot did the FBI get wind first?

The restriction I proposed (cf. Ross (1967)), namely that all prepositions must be stranded when following an idiomatic sequence

VA, where A is any single constituent (e.g., particle, verb, adjective, etc.), may or may not stand up under further investigation, but whatever the correct restriction to exclude the b - sentences above turns out to be, if the rule of Sluicing follows Question Formation, the latter rule's operation being subject to this restriction, then the contrast between the a -sentences and the b -sentences in (36) - (38) will follow automatically.

(36) a. Bill's planning on doing away with one of his inlaws, but I don't know which.

b. *Bill's planning on doing away with one of his inlaws, but I don't know with which.

(37) a. We'll have to make do with some kind of vile 3.2 beer for our punch, but I don't know exactly what kind.

b. *We'll have to make do with some kind of vile 3.2 beer for our punch, but I don't know with exactly what kind.

(38) a. The FBI got wind of one of the many plots to smoke draft cards, but I can't remember which.

b. *The FBI got wind of one of the many plots to smoke draft cards, but I can't remember of which.

It is not obvious to me how any interpretive theory of sluiced questions can make use of a restriction on pied piping to account for such contrasts as those in (36) - (38), for in such theories, the second clauses of these sentences do not undergo any movement rules in their derivations. Thus I regard these sentences as constituting strong evidence for the existence of a transformational rule of Sluicing.

2.3. A third argument, which exactly complements the one just discussed, can be adduced from sentences of a type not considered so far -- (39b).

(39) a. She was dancing, but I don't know with whom.

b. She was dancing, but I don't know who with.

Under certain conditions, which I will not go into in detail here, it is possible to delete everything in an embedded question except the question-word and a stranded preposition. This kind of Sluicing is the source of the elliptical question What for?, and of many other sentences like (39b).

One of the conditions under which this kind of Sluicing is not possible is when the stranded preposition introduces any one

of a number of types of adverbial prepositional phrases.[11] An example of this restriction is the impossibility of (40b).

(40) a. He would report me under some circumstances, but I can only guess under which.

b. *He would report me (under some circumstances), but I can only guess which under.

If Sluicing follows Question Formation, the ungrammaticality of (40b) can be made a consequence of the fact that the preposition of prepositional phrases of condition which begin with under must pied pipe -- such sentences as (41b) are impossible.

(41) a. Under what circumstances will the moon implode?

b. *What circumstances will the moon implode under?

Of course, if these two rules appear in the reverse order, the fact that just those prepositions which cannot be stranded by Question Formation cannot follow the question-word in a sluiced embedded question will have to be mentioned in the statement of the rule of Sluicing, as well as being mentioned as a constraint on Pied Piping, where it is independently motivated. Thus the facts of (40) and (41) again argue strongly for the ordering Question Formation -- Sluicing.

Obviously, these same facts also constitute strong counter-evidence for any interpretive theory of the sentences in (2), since any such theory would have to mention the idiosyncratic behavior of such prepositions as under in the rule which "interprets" the question-word as a full embedded clause.

Actually, however, the existence of such sentences as (40b) constitutes a far graver problem for any interpretive theory, for such a theory will have to add either the malodorous phrase structure rule (42) to the grammar of English, or the equally unappetizing reordering transformation in (43), in order to generate the surface constituents NP and preposition, in that order.

(42) $NP \rightarrow NP + \overline{P}$

(43) $X - [\ P - NP\ ]_{NP} - Y$

1 2 3 4 OPT ⇒

1 0 3 + 2 4

Condition: 2 = WH + X

It is apparent that the greatest difficulty with these rules is limiting their usefulness. Without severe and ad hoc restrictions, strings like those in (44a) and (44b) will be converted, by (42) or by (43), respectively, into (45a) and (45b).

(44) a. NP Aux V NP NP

b. Who talked to whom about what?

(45) a. *[Joe of]$_{NP}$ will talk [Bill to]$_{NP}$ [his investments about]$_{NP}$

b. *Who talked whom to what about?

Summing up, I think that the three arguments in §1, and the three in the present section, demonstrate conslusively that the deep structure of such sentences as those of (2) are not identical to their surface structures, but rather, that they derive from sentences such as those in (1), by a transformational rule of Sluicing, which, furthermore, must be ordered after Question Formation. In the next section, I will sketch some of the consequences of these conclusions.

3.

3.1. A preliminary formulation of the rule of Sluicing appears in (46).[12]

(46)

Sluicing

$W - [X - ([-Def])_{NP} - Y]_S - Z - [_S\ NP - [_S\ X - (P) - Y_S]_S] - R$

1 2 3 4 5 6 7 8 9 10 OPT ⇒

1 2 3 4 5 6 0 8 0 10

Conditions: 2 = 7

4 = 9

6 7 8 9 is an embedded question

The first thing to note about this rule is that it applies to non-constituents, a property distinguishing it from most other transformational rules. However, it may be only necessary to weaken the natural and desirable constraint that all transformations can only effect constituents to the extent specified in (47b).[13]

(47) a. Only nodes may be transformationally adjoined or substituted.

b. Terms which are transformationally adjoined to or substituted for (deletion being a special case of the latter) must be either nodes or variables.

The second fact of importance about rule (46) is that the variable in term 5 must be able to range over sentence boundaries, if this rule is to convert sentence sequences like (48a) into sequences like (48b).

(48) a. We're going somewhere today. Who knows where we're going today?

b. We're going somewhere today. Who knows where?

3.2. A third fact of importance has to do with the ambiguity of such sentences as (49).

(49) Harold scratched his arm and so did I.

Most speakers find that (49) can mean either that the speaker scratched Harold's arm, or that the speaker scratched his own arm. That is, (49) seems to have to be derivable from either (50a) or from (50b).

(50) a. Harold_i scratched his_i arm and I_j scratched his_i arm too.

b. Harold_i scratched his_i arm and I_j scratched my_j arm too.

The problem is, of course, that the two verb phrases in (50b) are not strictly identical, so any theory in which (49) can be derived from (50b) must contain a definition of "sloppy" identity, in which it is specified exactly what differences can be disregarded. A very preliminary definition was given in Ross (1967) §5.2, in which it was suggested that two otherwise identical strings which differed only in commanded pronouns (as is the case with scratch his, arm and scratch my, arm in (50b)) could be regarded as identical for the purposes of deletion.[14]

Recently, an alternative to this solution, involving interpretive rules for pro-forms like do so, do it, so do, etc., has been proposed (cf. Akmajian (1968)). Essentially, Akmajian suggests that (49) should be derived from a structure very close to its surface structure, and that the interpretive rule for so did should either "plug in" the NP I into both the subject

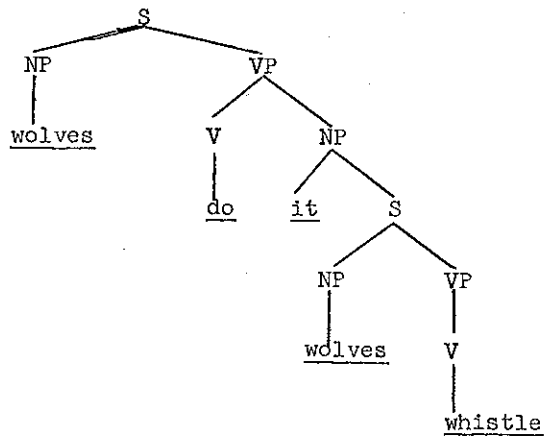
and possessive pronoun positions of the clause on the left, or only into the subject position, thus accounting for both possible meanings. Akmajian extends his proposal to deal with more complicated examples, such as (51),

(51) Bellwether hoisted Furbelow up into a pine tree and poured paint on him, and I want to do it to Peapod, using a cactus and catsup.

where he claims that the pro-form do it must stand for the discontinuous chunk ...hoist...up into...and poured...on.... While I do not disagree with Akmajian's intuition as to the meaning of this pro-form, I would reject the claim that the pronoun it must refer back to a non-constituent. For if the underlying structure of all activity sentences, such as (52a), contains a higher verb do, as in (52b), an analysis which is supported on many independent grounds,[15]

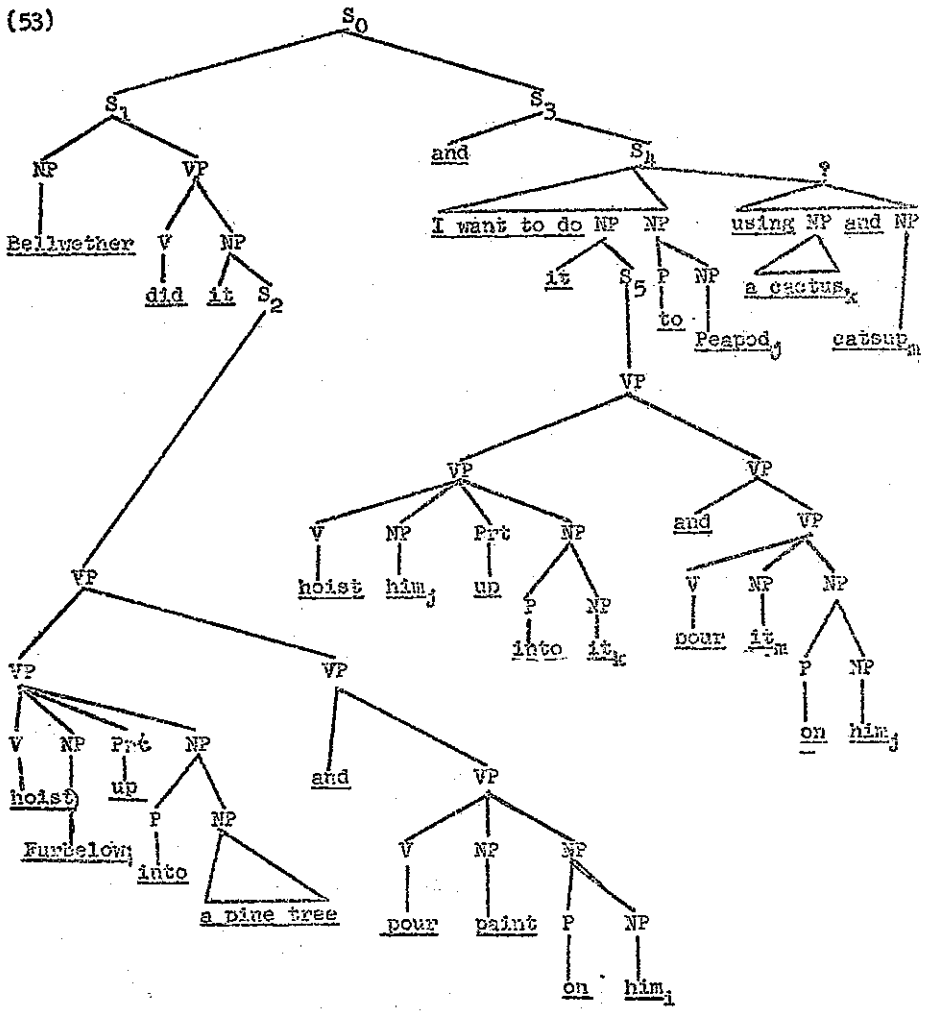
(52) a. Wolves whistle.

b.



then the structure immediately underlying (51) will be that shown in (53).

(53)



Under the proposed definition of sloppy identity, S_5 and S_2 are identical in (53), so the independently motivated rule of S Deletion, which converts sentences like (54a) into (54b), can apply to delete the constituent S_5.

(54) a. Jack believes maple syrup is fattening, but I don't believe maple syrup is fattening.

b. Jack believes maple syrup is fattening, but I don't believe it.

Thus, such sentences as (51) do not force the abandonment of the important limitation on pronominalization operations stated in (47b): in converting (53) to (51), only a constituent is deleted.[16]

Thus it appears that such sentences as (49) and (51) could in principle be generated either by some kind of interpretive rule, or by incorporating the notion of sloppy identity into linguistic theory. It would be desirable if outside evidence as to which of these alternatives is correct could be brought to bear on this issue, so that the theory will not have to contain both of these highly complex mechanisms.

Sluiced questions provide just such evidence. Consider the sentences in (55).

(55) Bob knows {how / when / where / how long / *why} to crane his neck, but I don't know {how / when / where / how long / *why}

My claim is that (55) has undergone Sluicing. Another possible source, suggested to me by Barbara Hall Partee, might appear to be VP Deletion, the rule that converts (50) into (49). This rule would convert sentences like (56a) into sentences like (56b). A second rule would then produce (56c), which has the form of a sluiced question.

(56) a. Jack knows how to [play chess]$_{VP}$, but I don't know how to [play chess]$_{VP}$.

b. Jack knows how to play chess, but I don't know how to.

c. Jack knows how to play chess, but I don't know how.

While I do not contest the derivation of (56b) from (56a), I see no reason to assume the existence of the rule of To Deletion that would be necessary to convert (56b) to (56c). Several facts argue against such a rule. First, the rule of Sluicing can never operate on embedded whether -clauses, as the sentences in (57) show.

(57) Ralph knows that I went, but his wife doesn't know { when / why / where / how / *whether }

If a rule of To Deletion existed, it would have to be constrained not to convert (58a) into (58b), a restriction which obviously would duplicate the one necessary to exclude the ungrammatical sentence in (57).

(58) a. Buff doesn't know whether to punt or not, and I don't know whether to, either.

b. *Buff doesn't know whether to punt or not, and I don't know whether, either.

The second reason, which is to my mind far more compelling than the first, is that the putative rule of To Deletion would be totally superfluous, if Sluicing is in the grammar. That is, the sentences in (55) and (56c) would automatically be generated by the simplest formulation of Sluicing, so there are no sentences that only To Deletion can generate. I conclude that no rule of To Deletion should appear in the grammar.

Let us suppose, however, that my arguments against To Deletion can be shown to be invalid. Sloppy identity will still be required, in order to convert (59a) to (59b), the latter being the input to To Deletion.

(59) a. I know how to [crane my neck]$_{VP}$, but you don't know how to [crane your neck]$_{VP}$.

b. I know how to crane my neck, but you don't know how to.

Observe that the VP crane my neck here deletes the VP crane your neck, which can only be identical if some definition of sloppy identity appears in the theory of grammar.

A last ditch attempt at keeping sloppy identity out of the theory of grammar could be made, if one were to deny the existence of a rule of VP Deletion. Such sentences as those in (60) indicate the scope of the problems confronting any such analysis.

(60) a. Some people think there are no such rules, but there { are / *is }.

b. He knows how to dress, but I don't know how to.

c. *He knows how to get high, but he doesn't know why to.

d. Paul Anderson's fat, and I { am / *I'm } too.

If there is no rule of VP Deletion, but rather some such interpretive rule as Akmajian proposes, then such VP-less sentences as the underlined phrases in (60) will have to be generated as deep structures. Particularly troublesome will be the problem of limiting the deep structure position of the NP expansion there (cf. (60a)), in such a way that the (presumably) necessary transformational rule of There Insertion is not duplicated in essence by the necessary phrase structure rules. Also, number agreement will have to be by an interpretive convention (cf. (60a)), a theoretical choice which will entail the unusual assertion that *he are fat is only semantically anomalous.

In (60b), some rules like those proposed in (25a) above will have to be devised, with provision being made for the complementizer to to follow the NP in (25a). Of course, no analysis containing such a revised phrase structure rule can explain why it is to that appears in this rule, rather than some other morpheme, such as ing or Winnebago.

If there is a rule of VP Deletion, the impossibility of (60c) is an automatic consequence of the strange fact, pointed out to me by Joseph Emonds, that in embedded questions consisting of a questioned constituent and an infinitive, all question words are possible except why.[17]

(61) I wondered { what / when / where / how long / whether / *why } to eat.

If phrase structure rules generate how to directly, as they would seem to have to, if (60b) is to be produced, they must be constrained so as not to generate why to. Any such constraint will duplicate the one which excludes the ungrammatical sentence in (61).

The most telling argument for a rule of VP Deletion has to do with the impossibility of contraction evidenced in (60d). Harold King has pointed out[18] that the general fact about contraction in English is that the auxiliary verbs can never contract when their object has been deleted, unless the auxiliary is later inverted. Some examples of this restriction are shown in (62).

(62) a. Tall though Lew {is / *'s}, we can beat the Bears.

b. I am taller than Lew {is / *'s}.

c. I wonder how much wine there {is / *'s} in the bottle.

d. Ready I {am / *'m} to help you.

The generalization linking the sentences in (62) to (60d) is clear: in all cases, it is a transformational rule of deletion that makes subsequent contraction impossible. This fact, in conjunction with those having to do with (60a) - (60c), indicates strongly that there is a rule of VP Deletion.

Thus whether it is argued that the sentence in (55) is to be derived via Sluicing, or via VP Deletion and To Deletion, it is obvious that the theory of grammar must contain some definition of sloppy identity, for either derivational route for (55) involves deletion under identity. But equally obviously, the deleted phrase must be to crane my neck, because of the impossibility of (63).

(63) *I don't know how to crane his neck.

The only way I can see to avoid the argument for sloppy identity provided by (55) is to claim that the relevant VP in (55) is crane neck until some very late, post-deletion, stage of the derivation, thus necessitating no theory of sloppy identity. But even this apparent way out can be closed off by a consideration of such sentences as (64).

(64) I know how to say I'm sorry, and Bill knows how, too.

If the second clause of (64) has the meaning of (65), and for the present, let us disregard the possibility of any other meanings, if any in fact exist,

(65) Bill knows how to say he's sorry.

then it is obviously unlikely that the subject of be sorry does not appear in deep structure, being filled in only later.

To summarize, my conclusions from the above are:

(66) a. There is no rule of To Deletion.

b. There is a rule of VP Deletion.

c. The theory of grammar must contain some definition of the notion of sloppy identity.

d. No evidence exists that such interpretive rules for pro-forms as those proposed by Akmajian are necessary, above and beyond the definition of sloppy identity. Therefore no such rules exist.

3.3. Consider next such sentences as those in (67).

(67) Bill seems to be doing away with someone, but he won't say {who / *with whom}.

The impossibility of with whom in (67) clearly indicates that Sluicing is at work here (recall the argument in § 2.2.). But if Sluicing is at work, then something must be deleting under identity. Semantically, it is clear that the source for the second clause of (67) must be (68a), not (68b).

(68) a. Bill won't say who he is doing away with.

b. *Bill won't say who he seems to be doing away with.

But this means that the tensed VP is doing away with is deleting under identity with the infinitival VP to be doing away with.[19] This suggests that these phrases should be absolutely identical at some point in derivations, unless sloppy identity is to be defined in such a way that some grammatical morphemes, like the infinitive marker to, can also be disregarded in checking for identity. In either case, it suggests a closer relationship between non-finite clauses and finite clauses than has previously been demonstrable.

A similar close relationship between derived nominals (cf. Chomsky (1967) for discussion of this term) and finite clauses can be adduced, on the basis of such sentences as those in (69).

(69) Bill mentioned his plans to do away with someone, but he didn't mention {who / *with whom}[20].

Clearly, Sluicing is involved here, and equally clearly, the source for the second clause of (69) must be (70).

(70) Bill didn't mention who he plans to do away with.

Thus Sluicing provides evidence against any theory of grammar in which his plans to do away with someone is not identical, at some stage, to he plans to do away with someone.

3.4. The most interesting consequence of Sluicing has to do with the sentences in (71).

(71) a. *Irv and someone were dancing together, but I don't know who Irv and were dancing together.

b. ??Irv and someone were dancing together, but I don't know who.

(71a) is ungrammatical because the Coordinate Structure Constraint (cf. Ross (1967), § 4.2., for some discussion of this constraint) has been violated: a conjunct has been questioned. The interesting sentence is (71b). Most speakers find this sentence ungrammatical to some extent, and in the most interesting dialects, it is perceived to be less ungrammatical than (71a).

What this means is the following: the constraints on chopping rules proposed in Ross (1967) cannot be locally defined -- rather, they must be derivational constraints, in the sense of Lakoff (1969). That is, whether or not Sluicing, an optional rule which applies after Question Formation (cf. § 2 above), applies to a string in which the Coordinate Structure Constraint has been violated, affects the degree of ungrammaticality of the string. The sequence of rules Question Formation - Sluicing produces a less deviant sentence than Question Formation alone does, assuming, in each case, that Question Formation has applied in some way that violates one of the constraints on chopping rules. That other constraints are affected can be seen from the sentences in (72)-(74).

(72) The Complex NP Constraint (cf. Ross (1967), § 4.1)

a. *She kissed a man who bit one of my friends, but Tom doesn't realize which one of my friends she kissed a man who bit.

b. ?She kissed a man who bit one of my friends, but Tom doesn't realize which one of my friends.

c. I believe {*the claim / 1 ——— 1} that he bit someone, but they don't know who I believe {*the claim / 1 ——— 1} that he bit.

d. I believe (??the claim) that he bit someone, but they don't know who.

(73) The Sentential Subject Constraint (cf. Ross (1967) § 4.4)

a. It is possible that he'll hire someone, but I won't divulge who (it is possible that he'll hire).

b. That he'll hire someone is possible, but I won't divulge {*who that he'll fire is possible / ??who}.

(74) The Left Branch Condition (cf. Ross (1967) § 4.4)

a. *I know that he must be proud of it, but I don't know how he must be proud of it.

b. *I know that he must be proud of it, but I don't know how.[21]

The facts of (71)-(74) provide additional evidence for there being a rule of Sluicing involved in the derivation of sentences like (2), for it is not obvious how an interpretive theory can make use of the constraints on variables in excluding the ungrammatical sentences in (71b), (72b,d), (73b), and (74b). In addition, however, they provide evidence of the strongest kind that the theoretical power of derivational constraints is needed in linguistic theory, for it appears that the way the constraints proposed in Ross (1967) should be restated is, informally, something like (75).

(75) If a node is moved out of its island[22], an ungrammatical sentence will result. If the island-forming node does not appear in surface structure, violations of lesser severity will (in general) ensue.

This statement makes it clear that the degree of ungrammaticality which is attendant on the violation of a constraint on variables cannot be ascertained except by inspection of the whole subsequent derivation. In short, ungrammaticality is a property not of merely deep or surface structures, or of pairs of trees which are related by rules, but rather of derivations.

3.5. In summary, I have argued in § 1 that there must be a transformational rule of deletion, Sluicing, involved in the derivation of such sentences as (2). In § 2, I presented evidence that Sluicing must follow Question Formation, and in § 3 I have tried to show that if Sluicing is a rule, then transformations must be able to apply across sentence boundaries, and they must be able to delete variables under identity. Furthermore, sloppy identity must be defined in the theory of grammar, and finite clauses appear to be related more closely to various non-finite constructions than has been previously argued for. Finally, all constraints on chopping rules appear to be derivational constraints.

Footnotes

The research on which this paper was based was supported in part by NIMH Grant MH-13390. Due to considerations of space and time, the version of this paper which appears in this volume has been truncated radically, in particular in § 3, where the consequences of postulating a transformational rule of Sluicing have only been touched on very briefly. A more detailed exposition can be found in the Jacobovits and Steinberg volume.

I would like to express my thanks to Joan Bresnan and George Williams for many helpful comments; to Bruce Fraser, Morris Halle, and David Perlmutter for reading and making many improvements on an earlier version; and especially to George Lakoff, whose penetrating criticisms and insightful suggestions have led directly to some of the major conclusions of the paper.

1. Cf. the references cited in the bibliography.

2. I say "approximately" because of the existence of people who profess to say such bizarre strings as It is we; and the like. If such people do exist, rule (7) can be modified in a trivial way.

3. Note that the existence of such variants as Big O is taller than { I / me } is not to be attributed to different statements of Case Marking, but rather to the way this rule is ordered with respect to the rule which deletes elements in than - clauses. That is, since all speakers agree in accepting Big O is taller than I am and rejecting *Big O is taller than me am, dialects which have nominative pronouns after than can be accounted for by ordering Case Marking before the rule which deletes am in the than - clause. On the other hand, dialects which exhibit oblique pronouns after than can be accounted for by reversing the order of these two rules, for when am has been deleted, the node S which used to dominate the than-clause will be pruned (for a discussion of this operation on trees, cf. Ross (1967), Chapter 3, especially § 3.1.5.), and the subject of the than-phrase, being no longer dominated immediately by S, will not be protected from being converted into an oblique pronoun by the condition on Case Marking.

4. This condition is not stateable in the present theory of grammar, which only allows Boolean conditions on analyzability in the statement of language-particular transformational rules, unless the inventory of basic predicates in which such conditions can be stated is expanded to include $A \geq B$ ("A immediately dominates B") in addition to $A > B$ ("A (weakly) dominates B") and $A = B$ ("A is identical to B"). I submit, therefore, that the correctness of rule (7) argues strongly for the need of adding this predicate to the list of basic predicates.

5. The condition is more complicated, due to the fact that conjoined subject NP's, even though they are not immediately dominated by S, must remain in the nominative case: God and I are similar. I will not go into the changes of rule (7) that follow from this fact.

6. This term is Paul Postal's (cf. Postal (1968a)). Postal expresses doubt, and I agree with him, as to whether such a rule can be assumed to exist.

7. I ignore here the homophonous verb wonder that appears in such sentences as I wonder that you survived. This verb, though intuitively closely related to the wonder of (15a), must apparently differ from it in at least some features, for while the wonder of (15a) can appear with the progressive auxiliary, this wonder cannot. Also, whereas Bill didn't wonder whether you had left is perfectly natural, ?*Bill didn't wonder that you had left strikes me as decidedly peculiar. I also do not intend the above characterization of possible objects of wonder to apply to wonder about, which seems to differ from both of the other wonder's, despite the strong intuition that I have that we are dealing here with variants of the same lexical entity. I can see no way of capturing this intuition, at present.

8. This position, with which I agree, was first defended by Jackendoff (cf. Jackendoff (1966)), and then, independently, by McCawley (cf. McCawley (1968)).

9. I here accept the identification, at the level of deep structure, of prepositional phrases and noun phrases, which was suggested first by Paul Postal, in classes at MIT and at the Linguistic Institute at the University of Indiana in 1964 (cf. also Postal (1968a)) and later proposed, on independent grounds, by Charles Fillmore (cf. Fillmore (1968)).

10. Joan Bresnan has called to my attention such sentences as He has a picture of somebody, but a picture of whom (*he has) I don't know, which are obvious counterexamples to this generalization. I confess to being totally baffled by such sentences, which may well totally invalidate this first argument. I can do nothing but call the attention of future researchers to this problem, in the hope that they will be able to solve it.

11. This restriction was first observed by Yuki Kuroda (Cf. Kuroda (1968)).

12. That the formulation in (46) is inadequate should be obvious enough not to require extensive scomment. The major difficulty with (46) is term 8, which is necessary so that sentences like (40b) can be generated. But clearly, in any correct statement of Sluicing, no such term should appear. The fact that a preposition can follow the question-word in a sluiced question should follow automatically from the fact that prepositions can be stranded in English. In French, German, Russian, and in many other languages, where prepositions cannot be stranded, sentences like (40b) do not exist. Thus to state term 8 in a rule of Sluicing is to miss a generalization. I will attempt a more adequate formal statement of this rule in the revised version of this paper which will appear in Jakobovits and Steinberg (to appear).

13. Two recent unpublished papers, Burt (1969) and Pope (to appear), present additional evidence that rules must be able to delete non-constituents. The former paper argues that sentences like After Bill, John spoke to Mary about sloppiness must derive from the fuller structure underlying.

In addition, Sluicing must be allowed to operate backwards, so that all of the sentences below can be generated.

Although I don't know who, I know he wants to see someone.

Although I know he wants to see someone, I don't know who.

I know he wants to see someone, although I don't know who.

?*I don't know who, although I know that he wants to see someone.

This last sentence is decidedly strange, in my speech, unless the subordinate clause is separated by an extra-long pause. Thus Sluicing would appear to have to be formulated as a bidirectional rule of deletion under identity. The fact that

it obeys the basic pronominalization constraint (that pronouns cannot both precede and command the NP they refer to.), as can be seen by the four sentences above, thus provides one more piece of evidence that such sentences as (2) are derived by a rule of deletion; for a transformational process of deletion is involved, the fact that it obeys the basic pronominalization constraint is an automatic consequence of the generalization stated in § 5.? of Ross (1967), which specifies that all deletions are subject to the pronominalization constraint. It is not apparent how any interpretive theory of sluiced sentences could make use of this restriction. After John spoke to Bill about sloppiness, John spoke to Mary about sloppiness. The latter paper argues that the difference in the intonation of the phrase Yes, happily (namely, falling or rising pitch), when used as a short answer to the question Is Bluebeard married?, is to be accounted for by allowing a transformation which can delete variables to apply after the output of the intonation rules that produce the differences in pitch between the sentences Yes, John is happily married (falling pitch) and Yes, John is married, happily (rising pitch).

14. This definition may provide a necessary condition for deletion under sloppy identity, but it is far from providing a sufficient one, as cases like the following show.

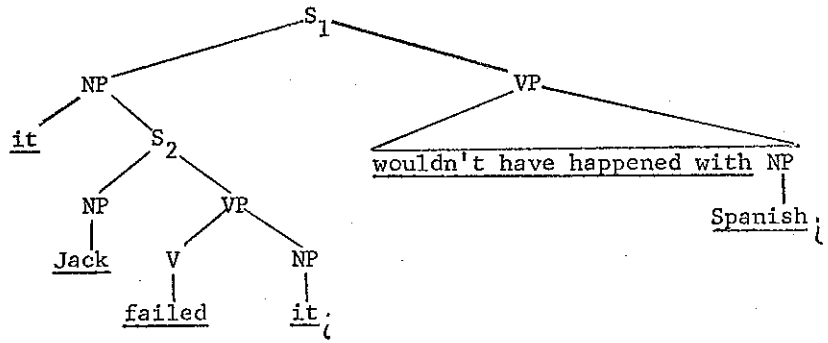
I told you that you would be famous, and Jack told Betty
(that $\left\{\begin{matrix}\text{you}\\ \text{she}\\ \text{he}\end{matrix}\right\}$ would be famous).

As the parentheses suggest, the that-clause in the second half of the above sentence can be deleted. If the underlying subject was you, the definition of sloppy identity is not called into play, for the string that you would be famous is repeated in both clauses. However, the string that she would be famous can also be deleted, for its only difference from the former string is the difference between the pronouns you and she , both of which are commanded by their antecedents.

The problem is that the proposed definition would also allow the deletion of the string that he would be famous, for the pronouns he is also commanded by its antecedent. Since the sentence can never have this meaning when the that-clause is deleted, it is obvious that further restrictions, probably having to do with the notion "corresponding" command pronoun, must be incorporated into the definition of sloppy identity. The problem of improving upon the proposed definition appears to be staggeringly complex, and it has thus far been unresolved.

15. Cf. Lakoff and Ross (in preparation) for discussion of this analysis.

16. Exactly the same is true of sentences like Jack failed French, but it wouldn't have happened with Spanish, which Chomsky suggests as a counterexample to the claim that only constituents can be pronominalized (cf. Chomsky (1968)). Given the definition of sloppy identity, and the following structure for the second clause of the above sentence,

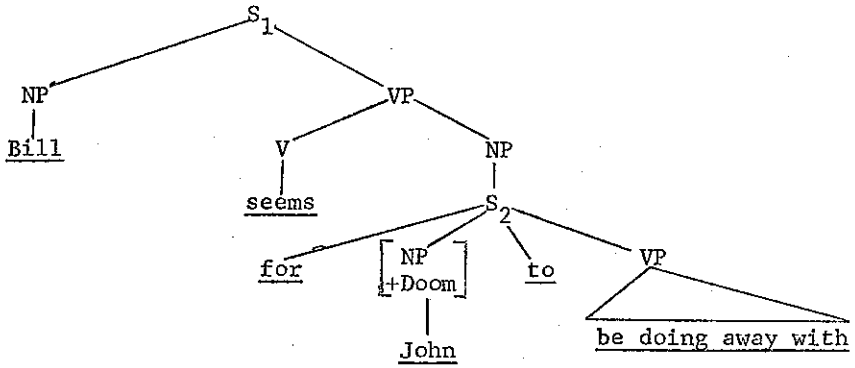


it can readily be seen that only the constituent S_2 need be deleted under identity.

17. And, of course, its underlying source for what $\left\{\begin{matrix}\text{reason}\\ \text{purpose}\\ \text{etc.}\end{matrix}\right\}$

18. Cf. King (to appear). The consequences of King's observation for the theory of grammar are elaborated in Lakoff (in preparation).

19. In addition, of course, it suggests that the rule variously called Pronoun Replacement (cf. Rosenbaum (1967)), It Replacement, Subject Raising, etc. must be formulated as a copying rule, not as a chopping rule, as previously believed, because it is the entire clause he is doing away with in (68a) that must be deleted under identity with a previous clause. That is, the derived constituent structure of the first clause of (67), at the time Sluicing applies, must be as shown below.



The feature [+Doom], first proposed by Postal in Postal (1968), will cause the subject of S_2 to delete at some later point.

The advisability of making Subject Raising a copying rule, where the original NP is doomed, is suggested by such sentences as

John is said to be smart, but I don't believe it.

20. This phrase may be grammatical if construed as a modifier of plan, a reading which I will disregard here.

21. The fact that Johnny stole someone's wallet, but I forget whose (wallet) is fully grammatical with or without wallet suggests to me not that the Left Branch Condition is not operative in this sentence, but rather that wallet has become one by a general rule of pronominalization, and that the resulting ungrammatical sequence *whose one is then obligatorily converted to whose.

22. Cf. Ross (1967), § 6.4 for a definition of this term.

Bibliography

Akmajian, Adrian. 1968. "An interpretive principle for certain anaphoric expressions," unpublished MIT ditto.

Bach, Emmon, and Robert Harms. (eds.) 1968. Universals in Linguistic Theory. New York, New York: Holt, Rinehart, and Winston.

Burt, Kim. 1969. "Some rules of non-constituent deletion," unpublished MIT ditto.

Chomsky, Noam. 1965. Aspects of the Theory of Syntax. Cambridge, Massachusetts: M.I.T. Press.

_____. 1967. "Remarks on nominalization," in Jacobs, Roderick and Peter S. Rosenbaum (eds.), Readings in English Transformational Grammar, Waltham, Massachusetts: Blaisdell-Ginn.

_____. 1968. "Deep structure, surface structure, and semantic interpretation," in Jakobovits and Steinberg (to appear).

Dougherty, Raymond C. 1968. "Two theories of pronominalization," unpublished MIT ditto.

Fillmore, Charles J. 1968. "The case for case," in Bach and Harms (1968).

Jackendoff, Ray S. 1966. "A note on selectional restrictions," unpublished MIT paper.

_____. 1969. Some Rules for English Semantic Interpretation. unpublished MIT doctoral dissertation.

Jakobovits, Leon, and Danny Steinberg. (to appear). Semantics: An Interdisciplinary Reader in Philosophy, Psychology, Linguistics and Anthropology. Urbana, Illinois: University of Illinois Press.

King, Harold V. (to appear). "On blocking the rules for contraction in English," in Linguistic Inquiry, Volume I.

Kuroda, Sige-Yuki. 1968. "English relativization and certain related problems," Language, Volume 44, Number 2, Part 2, pp. 244-266.

Lakoff, George. 1969. "On derivational constraints," this volume.

_____. (in preparation) Generative Semantics.

_____ and John Robert Ross. (in preparation) Abstract Syntax.

Mc Cawley, James D. 1968. "The role of semantics in grammar," in Bach and Harms (1968).

Pope, Emily. (to appear) "Answers to yes-no questions," in Linguistic Inquiry, Volume 1.

Postal, Paul M. 1968. Cross-Over Phenomena: A Study in the Grammar of Coreference. Yorktown Heights, New York: IBM Scientific Report.

Rosenbaum, Peter S. 1967. The Grammar of English Predicate Complement Constructions. Cambridge, Massachusetts: MIT Press.

Ross, John Robert. 1967. Constraints on Variables in Syntax. unpublished MIT doctoral dissertation.

The English Comparative Adjective Construction

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It has often been noticed in the past few years that a sentence like 1a is ungrammatical, while the perfectly parallel sentence 1b is grammatical. Intuitively, it seems clear that 1a is bad since it presupposes that Mary is a man. 1b is acceptable since the corresponding presupposition, that Bill is a man, is acceptable. It also seems clear that these are syntactic facts, not semantic ones. To see this, note that 1c, which is grammatical, differs from the ungrammatical 1a only by the preposing of the compared adjective "more energetic." This difference, application vs. non-application of the late syntactic rule of adjective preposing, could hardly form the basis for a semantic explanation of these facts.

(1a)*A more energetic man than Mary would be hard to find.
(1b) A more energetic man than Bill would be hard to find.
(1c) A man more energetic than Mary would be hard to find.

An obvious way to solve the problem would be to build the sentence "Bill is a man" into the deep structure of 1b, since then it would be explicit that 1b presupposes that Bill is a man. 1a would have to have the sentence "Mary is a man" in its deep structure, and this would be desirable since the oddity of 1a would be linked to the oddity of this component of its deep structure. The trouble with this approach is that it seems to provide no way of marking 1a as ungrammatical while still allowing 1c to be grammatical. Nevertheless, I will show that there is a very simple analysis along these lines that avoids this trouble in a natural way.

First consider the simplest comparative constructions, those of the form 2a. For these the deep structure is straightforward, on the order of 2b. The two morphemes that mark the comparative construction, "more" and "than," are discontinuous in 2b; still an analysis where they started off as continuous would not be essentially different. The node E is an adverbial "extent" node; in addition to containing comparatives, E would be the source of measure phrases such as "six feet" in a sentence such as "John is six feet tall." The symbol S_t will be used throughout to denote the sentence dominated by the node E, and S_c will be used to denote the sentence that contains the node E. Note that S_c may contain the node E directly, as in 2b, or in a relative clause, as in 5b below.

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