

STUDIES

in Philosophical Linguistics

SERIES ONE

to run into snags. I have not taken issue with what I take to be Caton's main point, which is that epistemic qualification is extensive in English and that it must be explained in the deep syntax by the postulation of phrase structure rules which introduce EQs. Although I think that Caton's treatment of these matters can and must be improved, I feel that his approach is essentially correct, and that his interest in the phenomenon of epistemic qualification is more than justified.

Richard T. Garner
The Ohio State University

AUXILIARIES AS MAIN VERBS

0. This paper has two major parts. In paragraph 1, I present ten arguments that indicate that auxiliaries and verbs are really both members of the same lexical category, verb. In paragraph 2, I present two arguments which indicate that they must be main verbs. That is, I will argue that in deep structure, each of the five underlined words in (1)

(1) Boris must have been being examined by the captain,

must be the main verb of some underlying S: all verbs (this term covers what have traditionally been called adjectives, auxiliaries, the copula, and true verbs) are directly dominated by VP in deep structure.

1.

1.1. Under the present analysis of English, there are at least three rules (Subject-Verb Inversion, Neg Placement and VP Deletion) which mention the term shown in (2) as part of their SD:

(2) Tns { M
have
be }

For instance, VP Deletion, which produces sentences like (3),

(3) Mike { built a house
is building a house
may build a house
must have been building a house
has a house
is sick } and Tom { did
is
may
must have been
has
does
is } to

presumably mentions the term shown in (2). In the present theory, this is a double accident: firstly, (2) is a very strange term (it is not even a constituent, and there is no explanation for why such a term should appear in widely separated rules, which appear to have nothing to do with one another); and secondly, the theory makes the claim that the items mentioned in (2) have no similarity which would predispose them to function together - (2) is as natural a term, in this theory, as the one shown in (4)

(4) Prep $\left(\left\{ \begin{array}{c} N \\ \text{toast} \\ \text{and} \end{array} \right\} \right)$

I suggest that (2) should be replaced in all rules which mention it by the entirely natural constituent shown in (5).

(5) $\left[\begin{array}{c} +V \\ +Aux \end{array} \right]$

1.2. The so-called copula, be, should really be analyzed as a true verb and should be assigned the feature [+Aux]. One piece of evidence for this is the fact that in languages whose basic order is SVO, the order in copular sentences is S be O; in SOV languages, the order is SO be. Another is the fact that be undergoes Gapping just as real verbs do:

(6) a. I ate fish, and Bill (ate) steak.
b. I am American, and Bill (is) Canadian.

Furthermore, there is a rule, Q Hopping, which moves quantifiers like all, both, each, etc. over be.

(7) They $\left\{ \begin{array}{c} \text{all} \\ \text{both} \\ \text{each} \\ \text{etc.} \end{array} \right\}$ are handsome \rightarrow They are $\left\{ \begin{array}{c} \text{all} \\ \text{both} \\ \text{each} \\ \text{etc.} \end{array} \right\}$ handsome.

Q Hopping also moves quantifiers over auxiliaries (under various conditions) - they have all gone, they must both have left, etc. Since be is a verb, and since this rule groups be and the auxiliaries, it provides some evidence that the latter are also verbs. I propose that both be treated as having the feature analysis shown in (5).

1.3. For many speakers, there is a difference in acceptability between (8a) and (8b),

(8) a. He₁ forced me to be examined by Dr. Hito.
b.* He₁ forced me to be examined by him₁.

although other speakers do not make this distinction. This appears to be due to a transformational constraint, of a very mysterious sort, which may be able to extend indefinitely far down into embedded sentences, if (9) is ungrammatical.

(9) ?? I want Mary to convince Tom to get Peter to try to force Jack to be examined by me.

The constraint seems to be that no agent in a for-to or Poss-Ing complement can be identical to the subject of a higher sentence, as long as only for-to or Poss-Ing sentences intervene between this agent and the subject.

Given this very rough statement of the constraint, the ungrammaticality of (10b) provides some evidence that the may of permission is a true verb, which has a first person subject, when used as a performative, as in (10a), or an unspecified NP

subject, as in Bars may stay open until 5 in England, and which undergoes the rule of Flip.

- (10) a. You may gladly be examined by Dr. Hito.
b. *You may gladly be examined by me.

(Notice also the expected switch of first to second person in questions: *May Tom be examined by you?)

If the sentences in (10) are derived from roughly the structures that underlie (11), the ungrammaticality of (10b) can be explained by the constraint mentioned above.

- (11) a. I gladly allow you to be examined by Dr. Hito.
b. *I gladly allow you to be examined by me.

But the rule of Flip applies only to verbs - hence the fact that it must apply to may argues that this modal is also a verb.

1.4. The verb force requires a [-stative] verb as the main verb of its complement sentence, while the verb seem, with a for-to complement, requires a [+stative] main verb.

- (12) a. I forced Dr. Mensch to $\left\{ \begin{array}{l} \text{learn} \\ *know \end{array} \right\}$ the answer.
b. Dr. Mensch seems to $\left\{ \begin{array}{l} *learn \\ \text{know} \end{array} \right\}$ the answer.

If the full range of auxiliaries which appear in the complements of these verbs is studied, the interesting complementarity shown in (13) comes to light:

- (13) I forced him to $\left\{ \begin{array}{l} \text{learn the answer} \\ *know \text{ the answer} \\ *be \text{ sleeping} \\ *have \text{ slept} \\ *be \text{ allowed to leave} \\ *be \text{ bald} \end{array} \right\}$ -He seems to $\left\{ \begin{array}{l} *learn \text{ the answer} \\ \text{know the answer} \\ \text{be sleeping} \\ \text{have slept} \\ \text{be allowed to leave} \\ \text{be bald} \end{array} \right\}$

If the auxiliaries be(ing) and have(en), the passive auxiliary be(en) and the copula be are analyzed as being true verbs, with the features [+Aux] and [+stative], then the facts in (13) can all be subsumed under the generalizations expressed in (14).

- (14) force (also coax, avoid, etc.) requires a [-stative] verb in the next lowest sentence

seem (also be reported, turn out, happen, etc.), when used with a for-to complement, require a [+stative] verb in the next sentence down.

The problems raised by such sentences as (15) require special treatment.

- (15) a. Max forced me to be photographed.
b. I forced John to be reading when Judy left.
c. Dr. Mensch seems to learn the answers.

In order to state (14) in a maximally simple way, it is necessary to analyze the auxiliaries of (13) not only as verbs, but as main verbs. This argument, therefore, belongs in part in §2 below.

1.5. The word so is a pro-S (cf. (16)).

- (16) a. I hope that we will win in Vietnam, but no sane man hopes so.
b. It may seem that we will win, to our glorious president, but it doesn't seem so to me.

Thus the fact that so can replace what follows auxiliaries indicates that this constituent is a sentence.

(17)

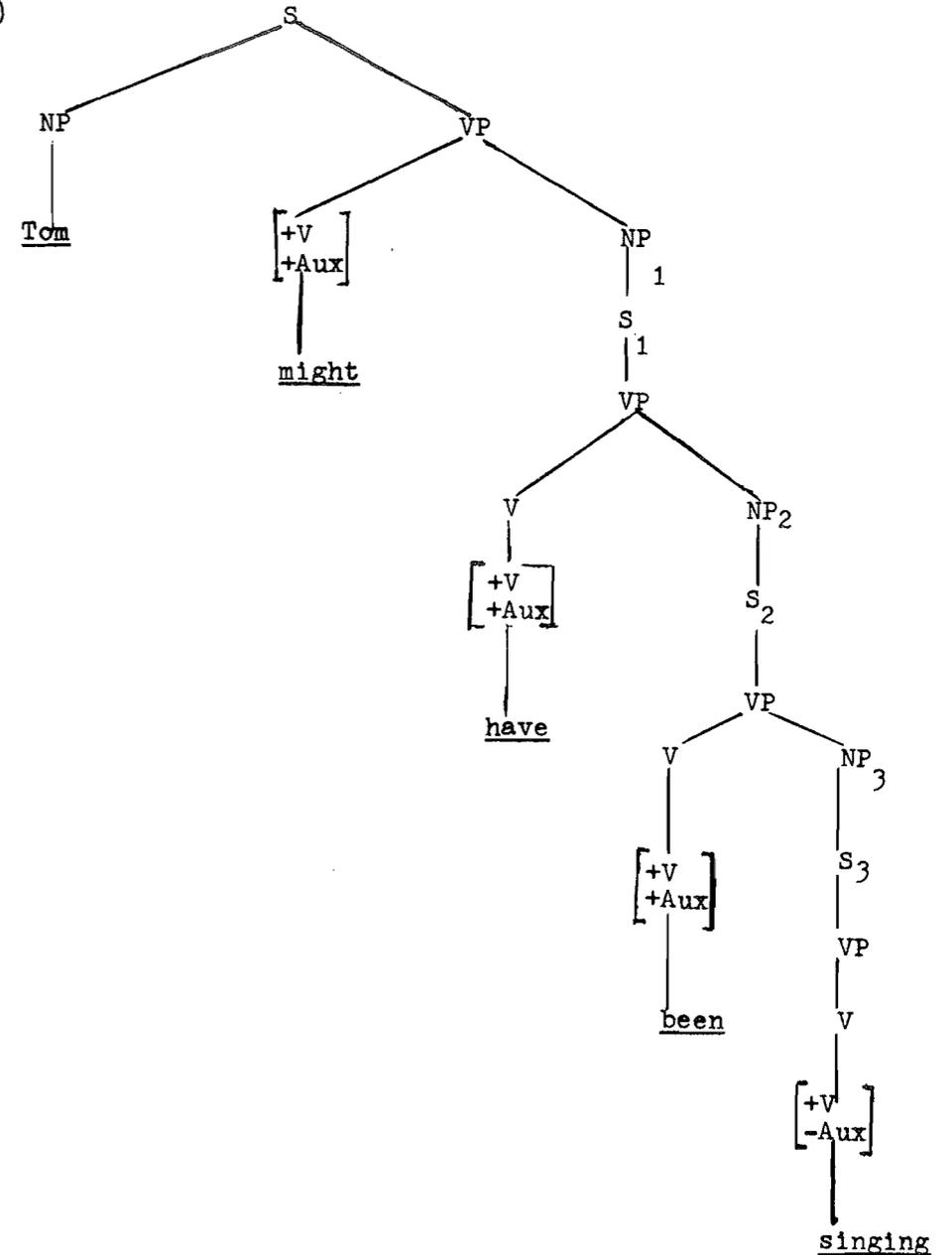
They said that Tom { likes ice cream
may be here
is working hard
had left
might have been singing } and so he

1 1

{ does
may
is
{ has
had }
{ might have been }
might have
might }
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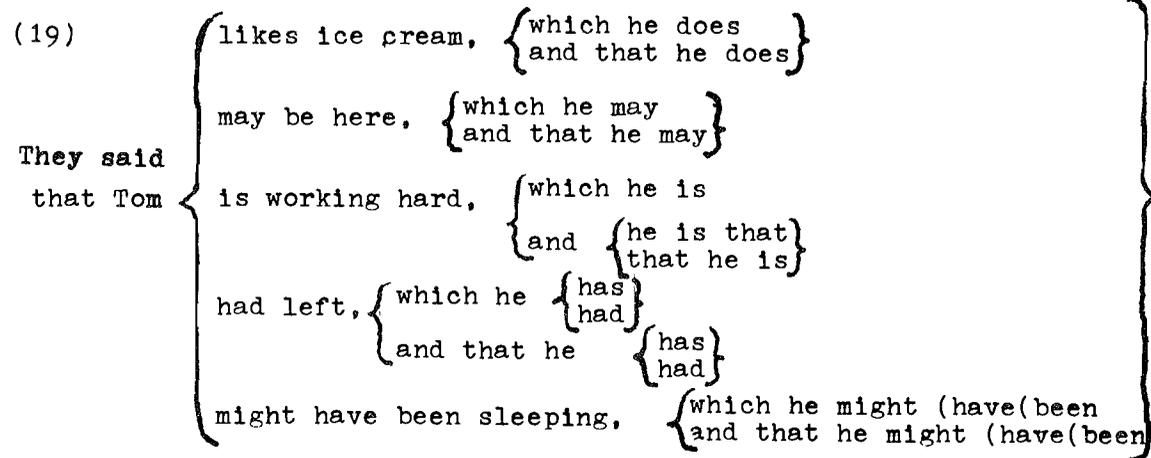
The fact that so can replace either singing, or been singing, or have been singing, in the last line of (17) constitutes a particularly telling criticism of the analysis of auxiliaries in Chomsky's Aspects of the Theory of Syntax, for in that analysis, neither of these last two phrases is even a constituent, let alone being a sentence. In my analysis, however, the derived structure of the embedded sentence in this last line would be approximately that shown in (18).

(18)



and since exactly the same structure would appear in the second conjunct of the last line in (17), the rule which substitutes so for an identical sentence would be able to replace S_3 , S_2 , or S_1 , thus yielding the three possible output sentences, after the so has been permuted to the front of the second conjunct. The reason that S_3 , S_2 , and S_1 do not prune will be discussed in Chapter 3 of my forthcoming monograph Variables in Syntax.

1.6. The NP nodes in (18) are motivated by the appearance of which and that in (19),



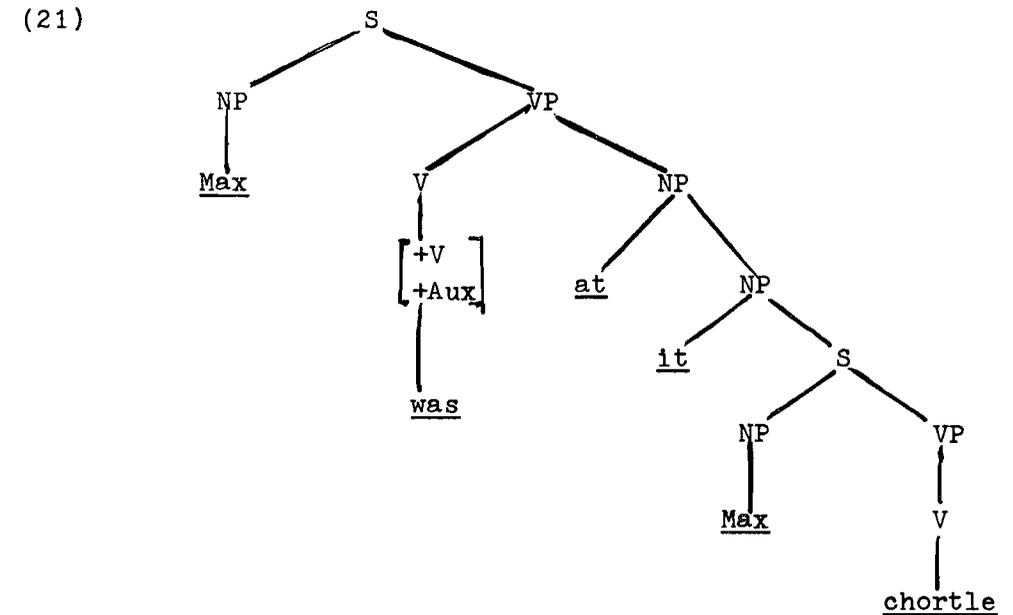
for in other sentences, which and that replace NP. Thus, this argument and the one in paragraph 1.5 both show auxiliaries to manifest synthetic phenomena characteristic of true verbs with sentential complements.

1.7 The rule of S Deletion converts (20a) into (20b).

- (20)
- a. I know that our cause is lost, but no one else knows that our cause is lost.
 - b. I know that our cause is lost, but no one else knows it.

If the deep structure of Max was chortling is that shown in (21), where the verb be requires the participle ing to be added to the

next verb down,

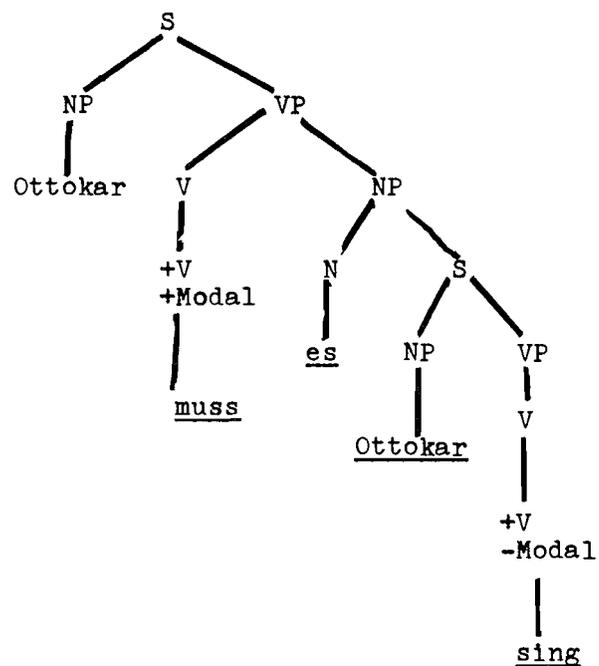


then the same rule of S Deletion can be used to produce (22).

- (22) Max was chortling when I got up yesterday morning
and he was still at it when I went to bed that night.

1.8. The rule of S Deletion appears in the grammar of German, and if the deep structure of Ottokar muss singen, 'Ottokar must sing', is that shown in (23),

(23)



sentence (24) can be produced with already available rules.

(24) Ottokar muss singen, und du musst es auch
 das musst du auch
 'Ottokar must sing, and you must (it) too.'

There are sentences which are identical to (24) except that forms of the verb müssen 'must' have been replaced by forms of können 'can', wollen 'want to', sollen 'ought to', or dürfen 'be allowed to', which indicates that these elements which have been analyzed as modal auxiliaries in the past, should really be analyzed as being true verbs, differing from 'real' verbs like versuchen 'try' only in having the feature [+Modal], where the latter has the feature [-Modal].

The fact that (25) is ungrammatical

(25) *Ottokar muss Krebs haben, und { du musst es auch
 das musst du auch }

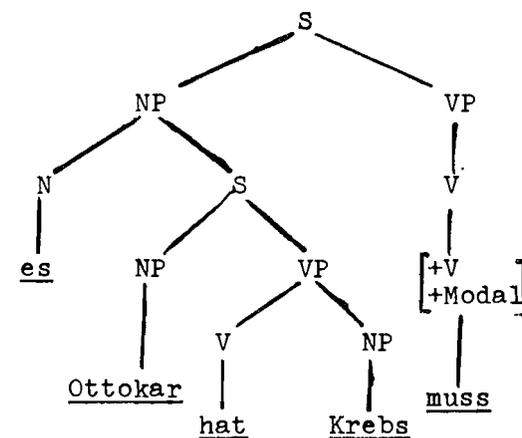
(Ottokar must have cancer and you must (it) too.)

is related to the fact that (26) is grammatical:

(26) Es muss sein, dass Ottokar Krebs hat.
 'It must be that Ottokar has cancer.'

I would claim that both come from roughly the same deep structure, a structure containing an intransitive verb müssen, such as the one shown in (27), which underlies the first clause of (25).

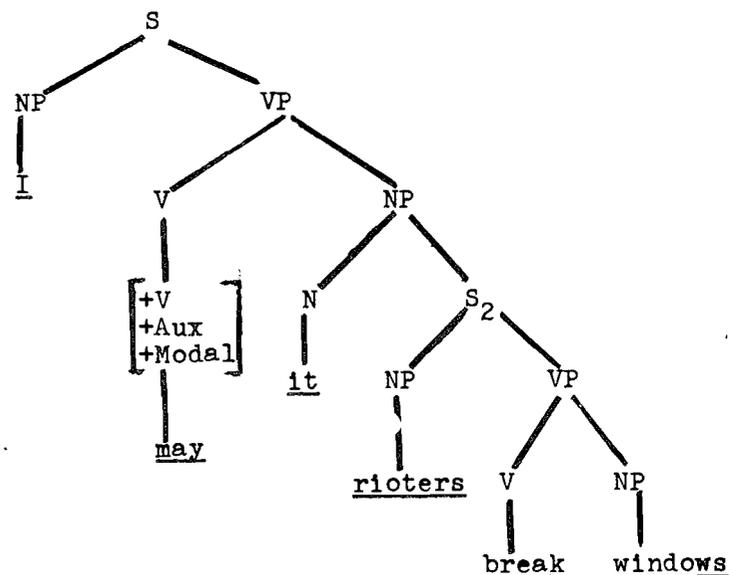
(27)



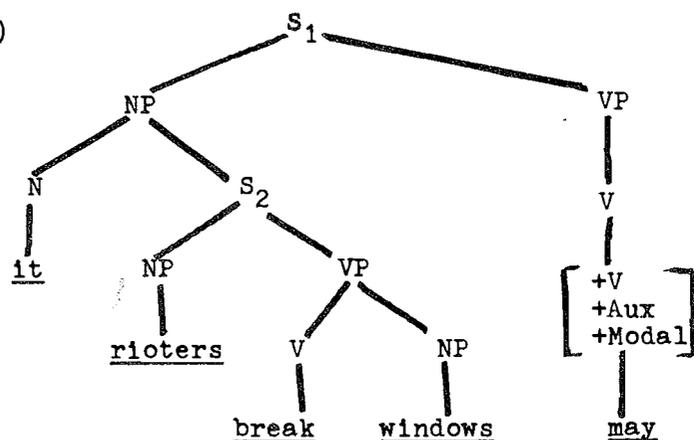
1.9. There are such transitive-intransitive verb pairs in English, too; the syntax of these will be investigated in detail in David M. Perlmutter's forthcoming dissertation (M.I.T. 1967). In particular, the verb may appears both transitively and intransitively in deep structures. Sentence (28) is ambiguous: one structure which underlies it is shown in (29), the other in (30).

(28) Windows may be broken by rioters.

(29)



(30)



Sentence (28) can be disambiguated by the adverbs gladly and possibly: (31a) can only derive from a structure like (29), and (31b) from one like (30).

- (31) a. Windows may gladly be broken by rioters.
 b. Windows may possibly be broken by rioters.

The fact that (31b), but not (31a), has a version which begins with the expletive there

- (32) a. *There may gladly be windows broken by rioters.
 b. There may possibly be windows broken by rioters.

seems to parallel the fact that sentences with intransitive verbs like happen, turn out, etc. can also start with this expletive.

- (33) a. There happened to be a commissar present.
 b. There turned out to be a catfish in the drain.

This could be accounted for by making the rule which inserts there cyclic. It would apply on S₂ in (30) after the passive had been formed. Then, when It Replacement applies, on S₁, the derived subject there would end up as the superficial subject of the intransitive verb may. It is not clear to me at present how (32a) is to be excluded, for if the rules of Passive and There Insertion apply to S₂ in (29), and this derived subject there is then made a constituent of the higher sentence by It Replacement on S₁, the rule of Flip should be able to apply, resulting in the ungrammatical (32a). I include a discussion of this case here not because I have an analysis which can account for the ungrammaticality of this sentence, but only because I feel that it is significant that the sense of (28) for which There Insertion can apply is the one related to sentence (34), which contains may as an intransitive.

- (34) It may be that windows will be broken.

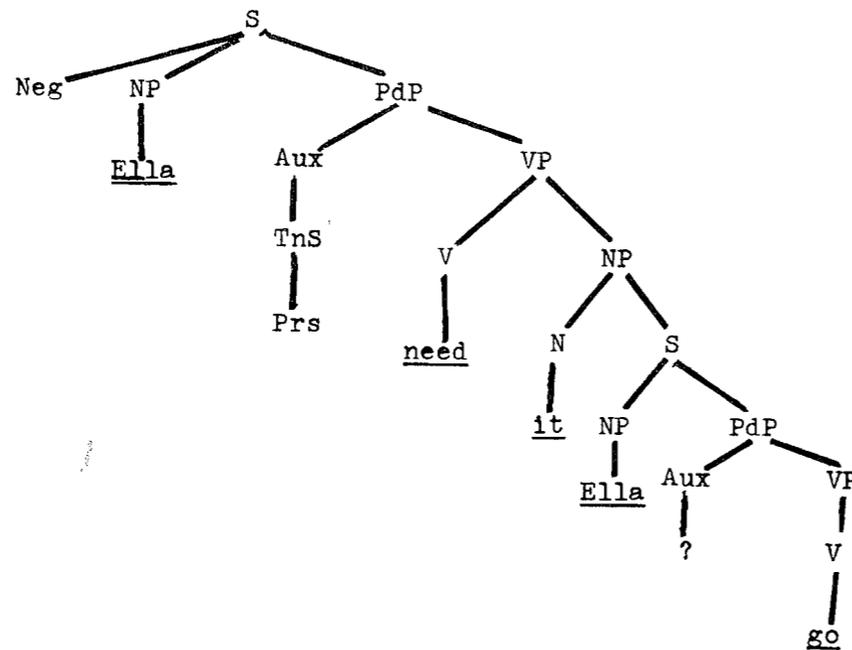
But many problems remain, and at present I cannot account for them satisfactorily with my analysis.

1.10. The sentences in (35) are felt to be variants of one another.

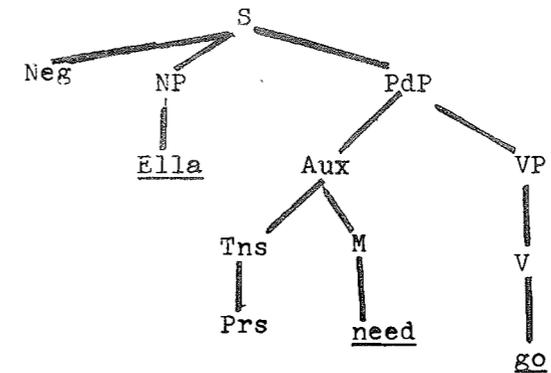
- (35) a. Ella doesn't need to go.
b. Ella need not go.

Yet in the Aspects analysis, these sentences come from totally different deep structures: (36) for (35a), and (37) for (35b)

(36)



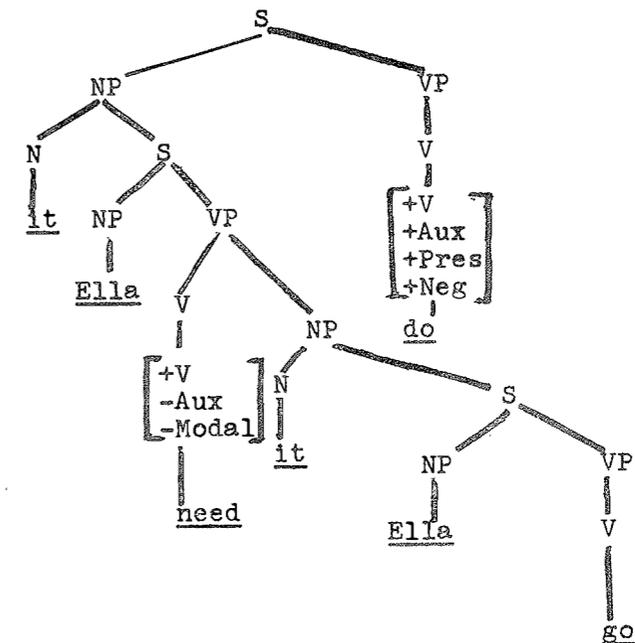
(37)



In this analysis, then, the only similarity between the sentences in (35) is phonological - it is a phonetic accident that there is a modal which is a homonym of a true verb, an accident which requires no more comment than the fact that the modal may is also homonymous with the name of a month.

In my analysis, however, both sentences in (35) would be derived from (38).

(38)



I am not sure of the deep structure source of negation, and so I have temporized by analyzing it as a feature of the highest $\left[\begin{smallmatrix} +V \\ +Aux \end{smallmatrix} \right]$, which carries the tense. To this structure, the optional rule in (39) can apply.

(39) $\left\{ \begin{smallmatrix} \underline{\text{dare}} \\ \underline{\text{need}} \end{smallmatrix} \right\} \xrightarrow{\text{OPT}} \left[\begin{smallmatrix} +Aux \\ +Modal \end{smallmatrix} \right] / \text{negative contexts}$

This rule is of course only a mnemonic for the correct rule - in particular, I have not tried to reconstruct the phrase "negative contexts". But (39) should apply to produce the sentences in (40), but not those in (41).

- (40)
- a. Willy need not leave.
 - b. How long need he fear your wrath?
 - c. Need he be so cruel?
 - d. He was crueler than he need have been.
 - e. I don't think he need have eaten so much.
 - f. I dare eat only what my doctor allows me to eat.

- (41)
- a. *Who need telephone her?
 - b. *If she need leave, she's to call me.
 - c. ??It's too bad that he need be so heartless.
 - d. *I don't think he dare eat so much.

Clearly much detail must be filled in to convert (39) into an adequate rule, but the outlines, at least, seem to be reasonably clear.

If (39) does not apply to (38), the infinitival complementizer, to, will not be deleted; and, after $[+Neg]$ has been spelled out as not, to the right of do, the verb on which it is marked, the rule which substitutes the next lowest verb for do, when this verb immediately follows do, will not apply. But if (39) does apply, a rule substituting modals for the tense verb will apply, and the not will again get spelled out to the right of the verb

on which it is marked, which is now the new modal need. The rules, then, must be ordered as shown in (42).

(42) $\left\{ \begin{smallmatrix} \underline{\text{dare}} \\ \underline{\text{need}} \end{smallmatrix} \right\} \rightarrow \left[\begin{smallmatrix} +Aux \\ +Modal \end{smallmatrix} \right]$

Modal Substitution for Tense Verb
 Negative Spelling Out
 Subject Verb Inversion
 Verb Substitution for Tense Verb
 Q Hopping

One final rule must apply to delete the infinitival complementizer to in (35b). It is possible that this rule can be made to be the same as the independently necessary rule which deletes to after the active forms of make, see, and hear (contrast (43a) with (43b)).

- (43)
- a. The FBI $\left\{ \begin{smallmatrix} \text{made} \\ \text{saw} \\ \text{heard} \end{smallmatrix} \right\}$ Peter curse.
 - b. Peter was $\left\{ \begin{smallmatrix} \text{made} \\ \text{seen} \\ \text{heard} \end{smallmatrix} \right\}$ to curse by the FBI.

Although many details remain to be filled in, the broad outlines of this analysis should be clear. In the Aspects analysis, however, not only would no rules directly relate (35a) and (35b) (it would only be possible to exhibit their relatedness by claiming that the lexical entry for the verb need and the one for the modal need are somehow similar), but it would be difficult to exclude sentences like (44).

- (44) *James $\left\{ \begin{smallmatrix} \text{dare} \\ \text{need} \end{smallmatrix} \right\}$ read this book.

Presumably some new kind of deep structure constraint would have to be devised to exclude (44). This is possible only if the term "negative context" turns out to be definable in terms of deep structure properties - not derived structure ones. Whether this is possible is not known at present.

2.

2.1. The first piece of evidence for the stronger hypothesis, that not only are auxiliaries [+V], but they are each the head V of some VP, comes from German. In my forthcoming paper "Gapping and the Order of Constituents", I argue that the direction in which the rule of Gapping operates depends on the phrase-structure configurations which are the input to the rule. In languages like English, verbs gap forwards, because the V is on the left branch of a VP. Thus (45a) is grammatical, but not (45b).

- (45) a. I ordered peaches, and Tom cream, and Bill Sterno.
 b. *I peaches, and Tom cream, and Bill ordered Sterno.

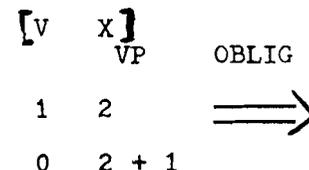
In languages like Japanese, where the underlying order is SOV, the reverse is true: Gapping operates backwards because the V is on a right branch of VP. Thus what corresponds to (46b) is grammatical, but (46a) is not.

- (46) a. *I peaches ordered, and Tom cream, and Bill Sterno.
 b. I peaches, and Tom cream, and Bill Sterno ordered.

German exhibits SVO word order in main clauses, and only sentences like (45a) can be the result of Gapping. In dependent clauses, however, both sentences like (46b), in which Gapping operates backward, and sentences like (46a), in which

it operates forward, are possible. Since Gapping can operate forward even in dependent clauses, I argue that basic order in German is not SOV, as has previously been held, but SVO; and that there is a rule, Verb Final, which obligatorily moves verbs in dependent clauses to the end of their VP. This rule is stated in (47)

(47) Verb Final



Condition: this rule works only in dependent clauses.

In languages with "free" word order, such as Latin, Russian, etc., where both SOV and SVO are possible output strings, sentences corresponding to (45a), (46a), and (46b) exist. No language exhibits sentences like (45b). These facts can be accounted for if it is assumed that Gapping is an "anywhere" rule, and can operate at any stage of a derivation, and that the underlying order of all free word-order languages is SVO. Thus the effective order of the rules of Gapping and Scrambling, the rule which permutes major elements within clauses, would be that shown in (48).

- (48) a. Gapping (OPT)
 b. Scrambling (OPT)
 c. Gapping (OPT)

Sentences like (45a) would be derived by merely applying Gapping to the underlying SVO order. Those like (46b)

would be derived by first applying Scrambling, which could give conjuncts of the form SOV, and then gapping backward. And sentences like (46a) would be derived by first gapping forward, yielding a string like (45a), and then applying Scrambling to the first conjunct, converting SVO to SOV order. It is impossible to derive (45b) with these rules.

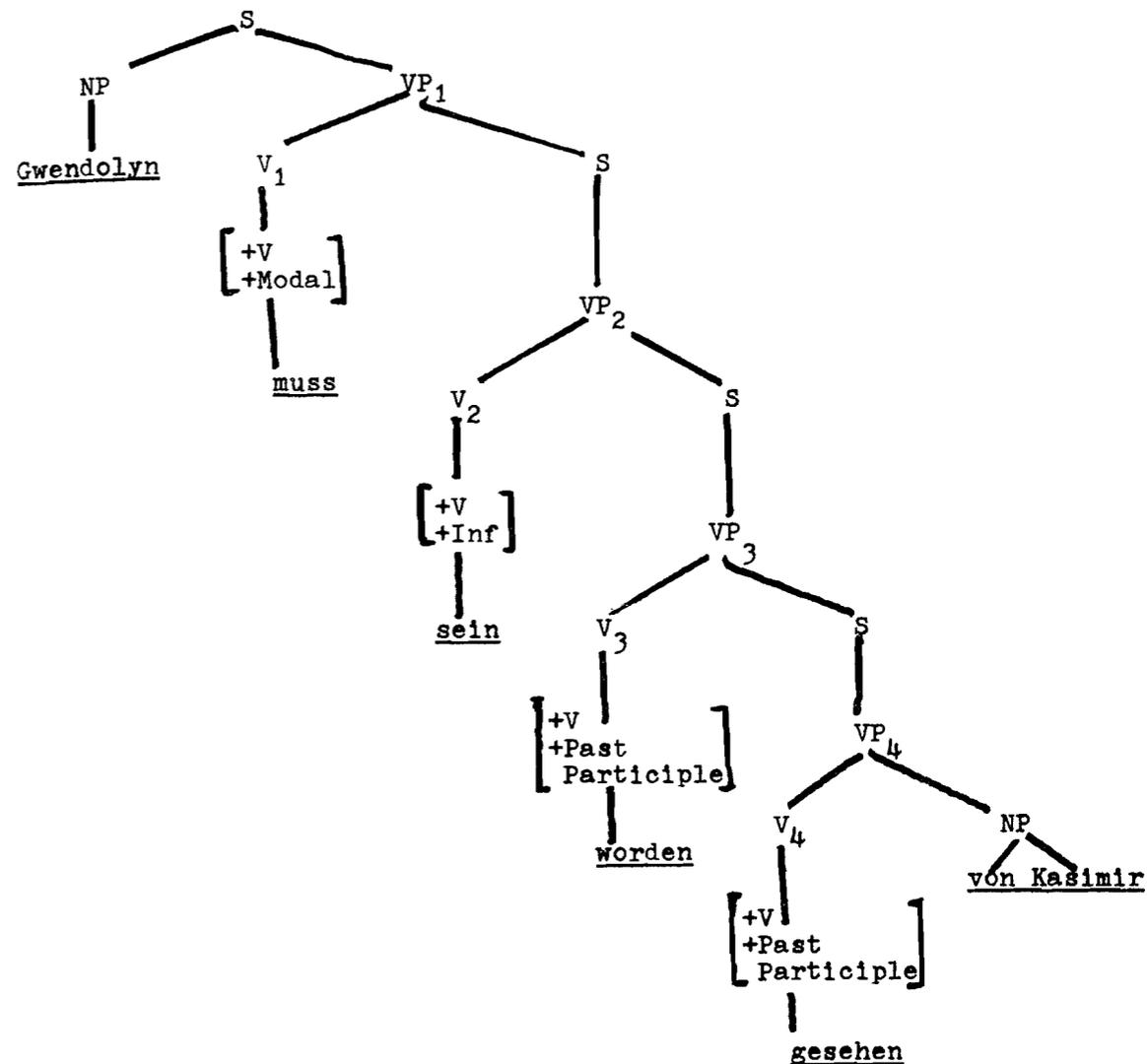
It is easy to see that a parallel explanation of the German facts can be given if the rules in German are ordered as in (49) and the underlying order of constituents in SVC.

- (49)
- a. Gapping (OPT)
 - b. Verb Final (CBLIG)
 - c. Gapping (OPT)

In order to derive sentences like (50), which contain many "Hilfsverben" (=auxiliary verbs), the structure of (50) at the time Verb Final applies must be roughly that shown in (51).

- (50)
- Gwendolyn muss von Kasimir gesehen worden sein
 Gwendolyn must by Casimir seen been be (=have)
 'Gwendolyn must have been seen by Casimir.'

(51)



Verb Final will move V_2 to the end of VP_2 , V_3 to the end of VP_3 , and V_4 to the end of VP_4 , thus reversing the order of the bottom three verbs. (Note that the order before the application of this rule corresponds exactly to the order of the corresponding verbs in English.) If (51) were itself in a dependent clause, Verb Final would also have to move V_1 to the end of VP_1 , as has happened in (52).

(52) weil Gwendolyn von Kasimir gesehen worden sein muss.
'because Gwendolyn must have been seen by Casimir'

It is absolutely necessary to postulate four verb phrases in (51), because there are other main clause-dependent clause pairs which show that the rule of Verb Final must produce order alternations with the main verb sehen 'see' (cf. (53)), with the passive "auxiliary" werden 'become' (cf. (54)), with the past tense verb sein 'be' (cf. (55)), and with the "modal auxiliary" müssen 'must'. (Compare (50) and (52)).

(53) a. Kasimir sieht Gwendolyn.
'Casimir sees Gwendolyn.'
b. weil Kasimir Gwendolyn sieht
because Casimir Gwendolyn sees
'because Casimir sees Gwendolyn'

(54) a. Gwendolyn wurde von Kasimir gesehen
Gwendolyn became by Casimir seen
'Gwendolyn was seen by Casimir'
b. weil Gwendolyn von Kasimir gesehen wurde
because Gwendolyn by Casimir seen became
'because Gwendolyn was seen by Casimir'

(55) a. Gwendolyn ist von Kasimir gesehen worden.
Gwendolyn is by Casimir seen become.
'Gwendolyn has been seen by Casimir'.
b. weil Gwendolyn von Kasim'r gesehen worden ist.
because Gwendolyn by Casimir seen become is.
'because Gwendolyn has been seen by Casimir'.

These facts provide evidence of the strongest kind that there is no category difference between German auxiliaries and other verbs, and that each auxiliary must be immediately dominated by VP. In passing it should perhaps be noted that the copula sein 'be' behaves just like all other verbs with respect to the rule of Verb Final; (56a) must be converted by this rule into (56b).

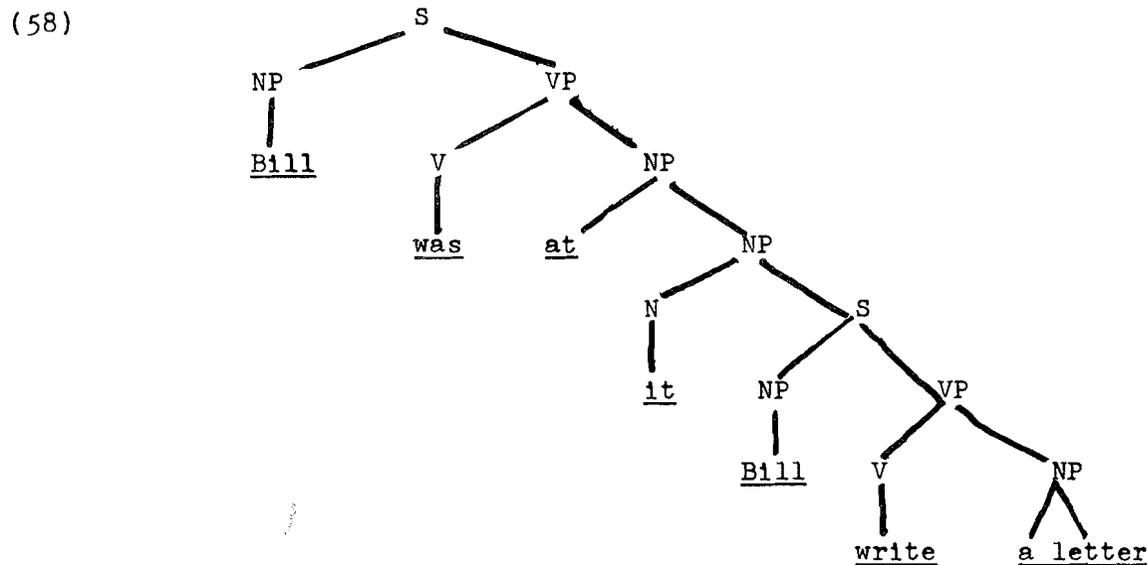
(56) a. Hans ist { im Knast
ekelhaft
ein Scheisskopf }
'Hans is { in the clink
repulsive'
a bounder' }
b. weil Hans { im Knast
ekelhaft
ein Scheisskopf } ist
'because Hans is { in the clink'
repulsive'
a bounder' }

2.2. The second argument that auxiliaries are main verbs comes from Greenberg (cf. his "Some universals of grammar" in his Universals of Language, M.I.T. Press), who notes that in languages whose basic order is SOV, if there is an auxiliary, it follows the verb, while in languages whose basic order is SVO, if there is an auxiliary, it precedes the verb. (Guarani, a language of South America, provides the only counterexample to this latter claim - according to Greenberg, it exhibits the

order SV Aux O.) These facts, which Greenberg merely notes, can be explained under the hypothesis that auxiliaries are main verbs: stating that the auxiliary was precedes writing a letter in (57).

(57) Bill was writing a letter.

is equivalent to stating that verbs precede their objects in English. I propose to derive (57) from (58).

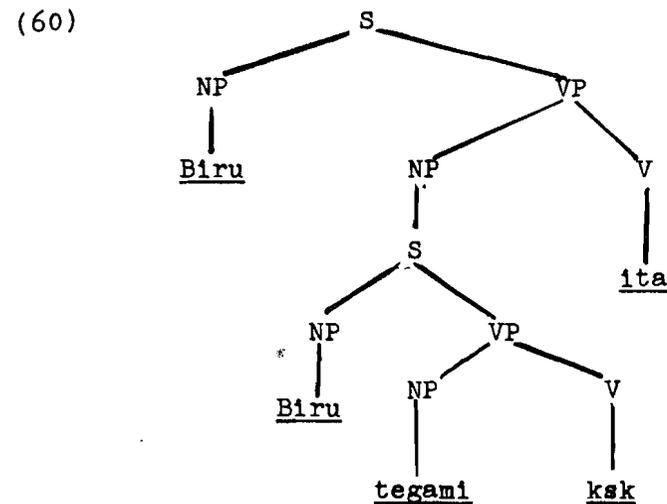


so the fact that was precedes its object, writing a letter, is the same as the fact that writing precedes its object, a letter, and these facts need only be stated once.

Similarly, in Japanese, where the basic order is SOV, we find the auxiliary ita 'was' following the verb kaite 'writing' in (59), which corresponds to (57).

(59) Biru ga tegami o kaite ita.
Bill (particle) letter (particle) writing was
'Bill was writing a letter.'

This sentence would derive from (60):



Once again, the fact that the phrase tegami o kaite precedes ita is the same as the fact that tegami o precedes kaite: all objects precede their verbs in Japanese.

The fact that auxiliaries which derive from intransitive verbs, like müssen 'must' in (27), behave like the transitive auxiliaries just discussed is accounted for by the fact that the rule of It Replacement, which converts (27) into (25), is formulated in such a way that it always adjoins the infinitive phrase to the same side of the VP as the side on which the other objects appear. In other words, It Replacement, just like Gapping, operates in different directions in different languages, the direction in particular languages being dependent on the input phrase-structure configuration.

3. This concludes this brief survey of the reasons I now know for claiming that auxiliaries belong to the same major category as verbs, and are introduced into deep structures the same way other verbs are. There are many problems which I have only discussed cursorily in this preliminary version, and some I have not touched at all, such as, for instance, the problem of insuring that the verbs in (1) are embedded into one another in the right order. Still, it seems to me that I have given enough evidence in support of my original hypothesis to justify the hope that the problems which are still outstanding will be able to be accounted for without it being necessary to abandon the basic points of the analysis I have proposed.

John Robert Ross

Massachusetts Institute of Technology