

Chapter 4

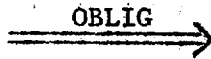
CONSTRAINTS ON REORDERING TRANSFORMATIONS

4.0. In this chapter and the next one, I will propose a set of constraints, some universal, some language-particular, which I will show to have roughly the same effect as the A-over-A principle. That is, I will show that with these constraints, it is possible to account for the six constructions in §2.2 which constitute evidence for the principle, while avoiding the counter-examples of §2.1. The A-over-A principle was postulated to be a constraint on transformational operations of all kinds, but I will attempt to show, in Chapter 6, that the constraints of Chapters 4 and 5 (and hence, the principle as well) should only apply to transformations which exhibit certain well-defined formal properties. The constraints of Chapter 4 only affect what I will refer to informally as reordering transformations -- transformations which have the effect of moving one or more terms of the structural description around some other terms of it. (The precise definition of this notion will not be given until Chapter 6.) Two examples of reordering transformations are the Question Rule and the Relative Clause Formation Rule, which are stated very schematically in (4.1) and (4.2) below.

A over A
 too broad
 movement TS

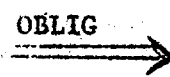
(4.1) Question

Q - X - NP - Y
 1 2 3 4
 1 3+2 0 4
 Condition: 3 dominates WH + some



(4.2) Relative Clause Formation

W - [NP NP - [s X - NP - Y]s] NP - Z
 1 2 3 4 5 6
 1 2 4+3 0 5 6
 Condition: 2 = 4



revised
 on p. 101

I will use ungrammatical questions and relative clauses to illustrate the effects that the constraints of this chapter have on all reordering transformations. In Chapter 6, I will present a list of all the other reordering transformations I know of, and show that they obey the same constraints.

4.1. The Complex NP Constraint

4.1.1. It is to Edward S. Klima that the essential insight underlying my formulation of this constraint is due. Noticing that the NP that man could be questioned in (4.3b), but not in (4.3a) (cf. (4.4)), Klima proposed the constraint stated in (4.5):

- (4.3) a. I read a statement which was about that man.
- b. I read a statement about that man.

- (4.4) a. *The man who I read a statement which was about is sick.
- b. The man who I read a statement about is sick.

* || (4.5) Elements dominated by a sentence which is dominated by a noun phrase cannot be questioned or relativized.

If Klima's constraint is used in conjunction with the principle for S-deletion stated in (3.6), it can explain the difference in grammaticality between (4.4a) and (4.4b), for it is only in (4.3a) that the NP that man is contained in a sentence which is itself contained in an NP: when (4.3a) is converted into (4.4b) by the Relative Clause Reduction Rule, the node S which dominates the clause which was about that man in (4.3a) is pruned by (3.6).

* || Although I do not believe it is possible to maintain (4.5), for reasons I will present immediately below, it will be seen that my final formulation of the Complex NP Constraint makes crucial use of the central idea in Klima's formulation: the idea that node deletion affects the potential of constituents to undergo reordering transformations. This hypothesis may seem obvious, at the present stage of development of the theory of grammar, but when Klima first suggested it, when the theory of tree-pruning was much less well-developed than it is at present, it was far from being obvious. In fact, this idea is really the cornerstone of my research on variables.

4.1.2. As I intimated above, however, I find that (4.5) must be rejected, in its present form. For consider the NP that man in (4.6): as (4.7) shows, it is relativizable,

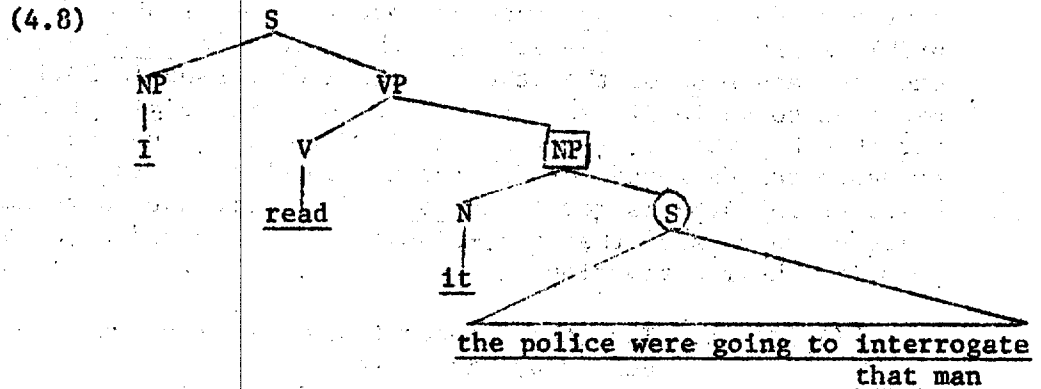
(4.6) I read

NP	[s	that the police were going to interrogate
that man]	S	NP.

(4.7) the man who I read that the police were going to interrogate

and yet the that-clause which contains it would seem to be a noun phrase, as I have indicated in the bracketing of (4.6). Presumably, the approximate deep structure of (4.6) is that shown in (4.8),

*Klima's
1st
approx.*



and unless some way is found of pruning the circled node S or the boxed node NP in (4.8), condition (4.5) will prevent the relativization of that man. There is abundant evidence that the first alternative is not feasible:

- (4.9) a. I read that Bill had seen me.
b. *I read that Bill had seen myself.
- (4.10) a. Evidence that he was drunk will be presented.
b. Evidence will be presented that he was drunk.
- (4.11) a. That Bill_i was unpopular distressed him_i.¹
b. That he_i was unpopular distressed Bill_i.

The Reflexivization Rule does not "go down into" sentences (cf. Lees and Klima (1963), Postal (1966b)); thus the fact that (4.9a) is grammatical, while (4.9b) is not, is evidence that that-clauses are dominated by S at the time that reflexivization takes place. Similarly, the fact that that-clauses may be extraposed, as is the case in (4.10b), indicates that they are dominated by the node S at the time that this rule applies. Finally, the fact that backward pronominalization² into that-clauses is possible (cf. (4.11a)) also argues that they must be dominated by the node S. So it seems implausible that the circled node S should be deleted by some principle which supplements (3.6), and there is no independent support for such an additional pruning principle in any case. Therefore, the only other way to save (4.5) is to claim that the boxed node NP must be deleted in the process of converting (4.8) into the surface structure which underlies (4.6).

Can the node NP be deleted? In §3.2 above, I discussed briefly Kuroda's proposal to generalize the notion of tree-pruning in such a way that any non-branching node whose head had been deleted would be pruned. While it is possible to propose such a generalized version of (3.6), there is as yet no syntactic evidence which indicates

that node deletion must prune out occurrences of NP or VP. The complex problems involving case-marking with respect to amici and eius on the one hand and meus on the other, which I discussed in §3.1.3 above, might be solvable if use were made of some principle of NP deletion, but this has yet to be worked out in detail; and unless some other evidence can be found for NP pruning, invoking it to delete the boxed NP in (4.8) is merely ad hoc. For there are many pieces of evidence which show that that-clauses are dominated by NP at some point in their derivation.

- (4.12) a. That the defendant has been rude was stoutly denied by his lawyer.
 b. What I said was that she was lying.
 c. Bill told me something awful: that ice won't sink.
 d. Muriel said nothing else than that she had been insulted.

That-clauses passivize (4.12a), they occur after the copula in pseudo-cleft sentences (4.12b), after the colon in equative sentences (4.12c), and after than in sentences like (4.12d): in all of these contexts, phrases can occur which are unquestionably noun phrases (e.g., Little Willy, potatoes, flying planes, etc.), and Lakoff and I argue that the syntactic environments defined by (4.12) can only be filled with noun phrases (cf. Lakoff and Ross (in preparation a)). If our arguments are correct, then that-clauses must be dominated by NP at some stage of their derivation. But it might be claimed that the late rule of It Deletion³, which deletes the abstract pronoun it when it immediately precedes a sentence, could change phrase-markers in such a way that the NP node which dominated it S would undergo pruning before Question and Relative Clause Formation had applied. Not enough is known about rule ordering at present for this possibility to be excluded, but it should be noted that even if it should prove to be possible to order It Deletion before all reordering transformations, thereby accounting for the grammaticality of (4.7) by providing for the deletion of the boxed NP of (4.8), it would still be necessary to explain why there is no difference in grammaticality between (4.13a) and (4.13b),

- (4.13) a. This is a hat which I'm going to see to it that my wife buys.
 b. This is a hat which I'm going to see that my wife buys.

After the verb see (to), the deletion of it is optional (in my dialect), and therefore, by the previous argument, while the that-clause in (4.13b) might not be dominated by NP, the that-clause in (4.13a) still would be. So unless some additional convention for NP pruning could be devised for this case too, (4.5) would not allow the generation

of (4.13a). Again, I must reiterate that there is no known evidence for pruning NP under any other circumstances, so the ad hoc character of the explanation which is necessitated if (4.5) is adopted is readily apparent.

But there is an even more compelling reason to reject (4.5) than the ones above: as I pointed out in §2.4.1 above, it is in general the case that elements of reduced relative clauses and elements of full relative clauses behave exactly the same with respect to reordering transformations. This can be seen from the following examples: NP which are in the same position as Maxime in the sentences of (4.14) cannot be questioned (cf. the ungrammaticality of (4.15)),

- (4.14) a. Phineas knows a girl who is jealous of Maxime.
 b. Phineas knows a girl who is behind Maxime.
 c. Phineas knows a girl who is working with Maxime.

- (4.15) a. *Who does Phineas know a girl who is jealous of?
 b. *Who does Phineas know a girl who is behind?
 c. *Who does Phineas know a girl who is working with?

nor can they be questioned, even after the relative clauses of (4.14) have been reduced (this is evidenced by the ungrammaticality of (4.16)).

- (4.16) a. *Who does Phineas know a girl jealous of?
 b. *Who does Phineas know a girl behind?
 c. *Who does Phineas know a girl working with?

It was facts like these which motivated the condition stated in (2.26) above, which I repeat for convenience here.

- * || (2.26) No element of a constituent of an NP which modifies the head noun may be questioned or relativized.

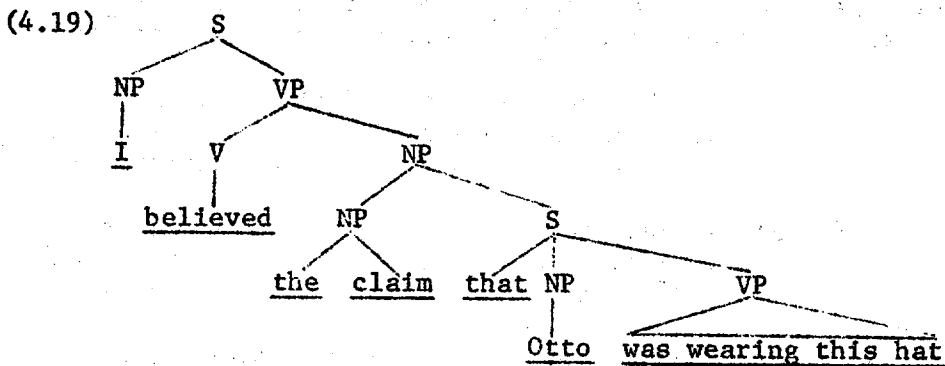
In the light of the facts of (4.15), and (4.16), it would appear that it is the grammaticality of (4.4b) which is problematic, not the ungrammaticality of the sentences in (4.16). And there are parallel facts which have to do with Reflexivization, which I will present in §4.1.6 below, which also support this interpretation. So condition (4.5), which takes the differences between the sentences in (4.4) to be typical, would seem to be a projection to an incorrect general conclusion from a case where special circumstances obtain. In the next section, I will give some evidence which allows the formulation of a broader-based generalization.

4.1.3. The sentences of (4.17), which only differ in that the NP object of believe has a lexical head noun in the first, but not in the second, differ as to relativizability, as the corresponding sentences of (4.13) show.

- (4.17) a. I believed the claim that Otto was wearing this hat.
 b. I believed that Otto was wearing this hat.

- (4.18) a. *The hat which I believed the claim that Otto was wearing is red.
 b. The hat which I believed that Otto was wearing is red.

If the analysis proposed by Lakoff and me (op. cit.) is correct, the d.c.s. of (4.17a) will be roughly that shown in (4.19):



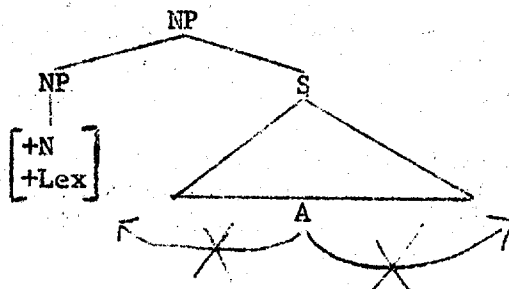
Whether or not we can show it to be correct that abstract nouns followed by sentential clauses in apposition to them have exactly the same $[NP\ S]_{NP}$ structure that we argue relative clauses have, it is clear that these constructions are highly similar. Condition (4.20), the Complex NP Constraint, is formulated in an effort to exploit this similarity to explain the ungrammaticality of sentences like (4.18a) and (4.15) on the same basis.

(4.20) The Complex NP Constraint

No element contained in a sentence dominated by a noun phrase with a lexical head noun may be moved out of that noun phrase by a transformation.

To put it diagrammatically, (4.20) prevents any constituent A from being reordered out of the S in constituents like the NP shown in (4.21),

(4.21)



as the X's on the two arrows pointing left or right from A designate. (Note that (4.20) does not prohibit elements from reordering within the dominated sentence, and in fact, there are many rules which effect such reorderings. Some will be discussed in §5.1 below.)

I have assumed the existence of a feature, [+ Lex], to distinguish between lexical items like claim in (4.17a) or girl in (4.14) on the one hand, and the abstract pronoun it of (4.13a) on the other. Since it is possible to move elements out of sentences in construction with the third of these, as (4.13a) attests, but not out of sentences in construction with the first two ((4.18a) and (4.15) are ungrammatical), it will be necessary for the theory of grammar to keep them distinct somehow. The feature [+ Lexical] may not turn out to be the correct one; I have chosen it not only on the basis of the facts just cited but also with regard to the following parallel case in Japanese.

4.1.4. In Japanese, and I believe in all other languages as well, no elements of a relative clause may be relativized. Japanese relative clauses invariably precede the noun they modify. Superficially, they appear to be formed by simply deleting the occurrence of the identical NP in the matrix sentence. Thus when the sentence (4.22) is embedded as a modifier onto the NP sono sakana wa 'this fish,' which is the subject of (4.23), (4.24) results.

*it's NP
7 in
hel
el
that → φ*

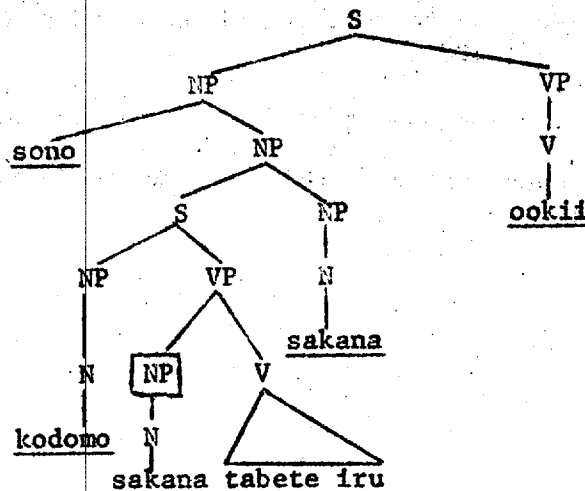
(4.22) kodomo ga⁴ sakana o tabete iru,
child fish eating is
'The child is eating the fish.'

(4.23) Sono sakana wa ookii.
That fish big
'That fish is big.'

(4.24) Sono kodomo ga tabete iru sakana wa ookii.
That [child eating is] fish big
'That fish which the child is eating is big.'

The deep structure of (4.24) is that shown in (4.25)⁵.

(4.25)



In the derivation of (4.24) from (4.25), when the Relative Clause Formation Rule applies, the only apparent change that occurs in (4.25) is that the boxed node NP disappears. It would thus appear that the English version of the Relative Clause Formation Rule, which was stated in (4.2), is fundamentally different from the Japanese version, for in the former, the embedded identical NP is reordered and placed at the front of the matrix sentence, while in Japanese, the embedded NP is merely deleted.

But there are two facts which lead me to believe that this dissimilarity is only superficial. First of all, the Japanese Relative Clause Formation Rule is subject to the Complex NP Constraint and also to the Coordinate Structure Constraint, which will be discussed in §4.2, and I will show, in Chapter 6, that simple deletion transformations are not subject to these two conditions. Secondly, in Japanese, as in all other languages I know of, the crossover condition, which Postal has proposed, obtains.

This condition, as Postal originally stated it,⁶ prevents any transformation from interchanging two coreferential NP. Since the Passive Rule effects such an interchange, reflexive sentences cannot be passivized, as was noted by Lees and Klima (cf. Lees and Klima (1963)).

- (4.26) a. Rutherford understands himself.
 b. *Rutherford is understood by himself.
 c. *Himself is understood by Rutherford.

The condition can be generalized, however. Subjects of sentences which appear as the object of say can normally be relativized: that this is true of the NP pudding in (4.27a) can be seen from the grammaticality of (4.27b):

- (4.27) a. The man who ordered ice cream said the pudding_i would be tasty.
 b. The pudding which the man who ordered ice cream said would be tasty was a horror show.

But if (4.27a) is changed so that the coreferential NP the pudding_i appears not only as the subject of would be tasty but also as the deep object of ordered, and if backward pronominalization has applied, yielding (4.28),

- (4.28) The man who ordered it_i said the pudding_i would be tasty.

then, ^{ok} for many speakers, the subject NP of the embedded sentence is no longer relativizable.

Crossover
 condition
 (Postal)
 *//

(4.29) *The pudding_i which the man who ordered it_i said_^ would be tasty was a horror_{show}.

While (4.29) is an acceptable sentence if the pronoun it refers to some other NP, it is ungrammatical if it has the same referent as the head noun of the subject of (4.29).

These facts can be explained by generalizing the crossover condition as shown in (4.30):

(4.30) The Crossover Condition

No NP mentioned in the structural index of a transformation may be reordered by that rule in such a way as to cross over a coreferential NP.

This condition is strong enough to exclude (4.29), for in carrying out the Relative Clause Formation Rule to form (4.29), it would have been necessary to move the subject of would be tasty leftwards over the coreferential pronoun it. This also explains why the pronoun he in (4.31a) can refer to the same man as the head NP the man but cannot do so in (4.31b).

- (4.31) a. The man_i who said he_i was tall
- b. *The man_i who he_i said_^ was tall

However, (4.30) is too strong -- it would incorrectly prevent (4.32a) from being passivized, and (4.32b) could not be generated.

- (4.32) a. The sheriff_i denied that gangsters had bribed him_i.
- b. That gangsters had bribed him_i was denied by the sheriff.

At present, I know of no way to weaken (4.30) to avoid this wrong result.

The crossover condition also obtains in Japanese: the Japanese version of the Passive Rule, which converts (4.33a) to (4.33b),

- (4.33) a. sono hito wa/sakana o/aratta
 that man fish washed
 'That man washed the fish.'
- b. sakana wa/sono hito/ni/arawareta
 fish that man was washed
 'The fish was washed by the man.'

cannot apply to reflexive sentences. (4.34a) cannot be passivized, as the ungrammaticality of (4.34b) shows.

(but too strong)

*

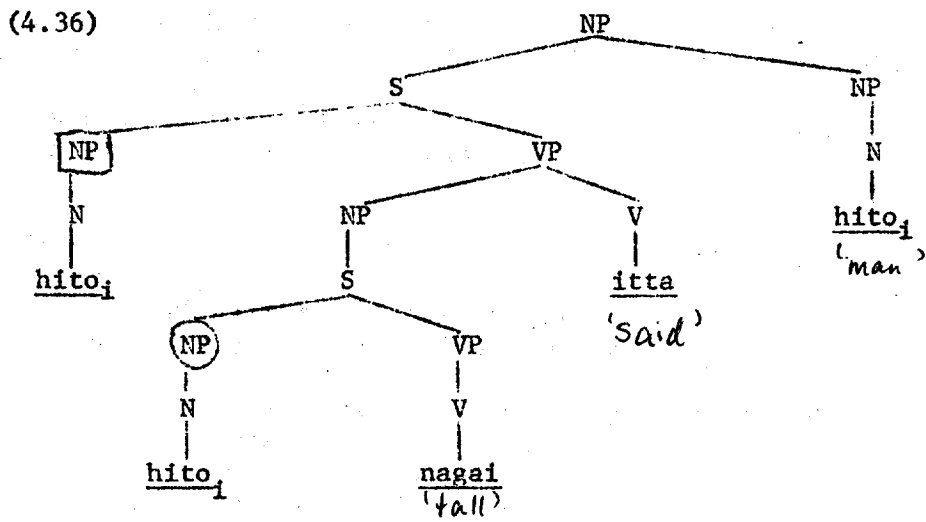
||

- (4.34) a. sono hito wa zibun o aratta
 that man self washed
 'That man washed himself.'
 b. *zibun wa sono hito ni arawareta
 '*That man was washed by himself.' = 'himself was washed by that man'

The crossover condition, by its very nature, applies only to transformations which reorder constituents, so the fact that grammatical and ungrammatical pairs of Japanese relative clauses can be found which parallel those in (4.31) is a second indication that the Japanese rule of Relative Clause Formation also involves reordering, and not merely deletion.

- (4.35) a. kare₁ ga/nagai/to | itta/hito₁
 he tall that/said/man
 'The man who said he was tall'
 b. *hito₁ ga/nagai/to | itta/hito₁/
 man tall that/said/man
 '*The man₁ who he₁ said was tall'

The fact that the first occurrence of hito 'man' in (4.35b) cannot have the same referent as the second one indicates that the term 'cross over,' which was used in the statement of (4.30), cannot be taken simply to refer to the linear order of words in the sentence, for the underlying structure of (4.35a) is that shown in (4.36).



As (4.35) shows, the boxed NP can be relativized, although the circled NP cannot. If I am correct in attributing these facts to the crossover condition, which (4.34b) shows to be necessary in Japanese in any case, then, if the rule of Relative Clause Formation in Japanese operates in such a way as to move the identical NP in the matrix sentence to the right end of the embedded sentence, in the opposite direction from

that in which it moves in English⁷, the notion of "crossing over" must be defined in such a way as to take into consideration not only the one-dimensional linear ordering of constituents, but also their two-dimensional hierarchical arrangement.

At any rate, whether or not my contention that the Japanese version of Relative Clause Formation involves reordering is correct, it is a fact that elements of relative clauses cannot be relativized. For example, sentence (4.24), in which the NP kodomo ga 'the child' appears as the subject of a relative clause, cannot be embedded as a modifier of the subject NP of (4.37), as is shown by the ungrammaticality of (4.38).

(4.37) kodomo ga byooki da.
 child sick is
 'The child is sick.'

(4.38) *Sono_A tabete iru (sakana ga ookii) kodomo ga byooki da.
 that eating is fish big child sick is.
 '*The child who that fish which (he) is eating is big is sick.'

Furthermore, there are Japanese sentences, like (4.39), which parallel those in (4.17); and, just as is the case in English, while elements can be relativized from the object clause of (4.39b), which corresponds to (4.17b), this is not possible in (4.39a), which corresponds to (4.17a). This can be seen from the ungrammaticality of (4.40a) and the grammaticality of (4.40b).

(4.39) a. Otto ga kono boosi o kabutte ita to iu syutyoo
 Otto this hat wearing was that say claim
 o watakusi wa sinzita.
 I believed
 'I believed the claim that Otto was wearing this hat.'
 b. Otto ga kono boosi o kabutte ita koto o watakusi
 Otto this hat wearing was thing I
 wa sinzita.
 believed
 'I believed that Otto was wearing this hat.'

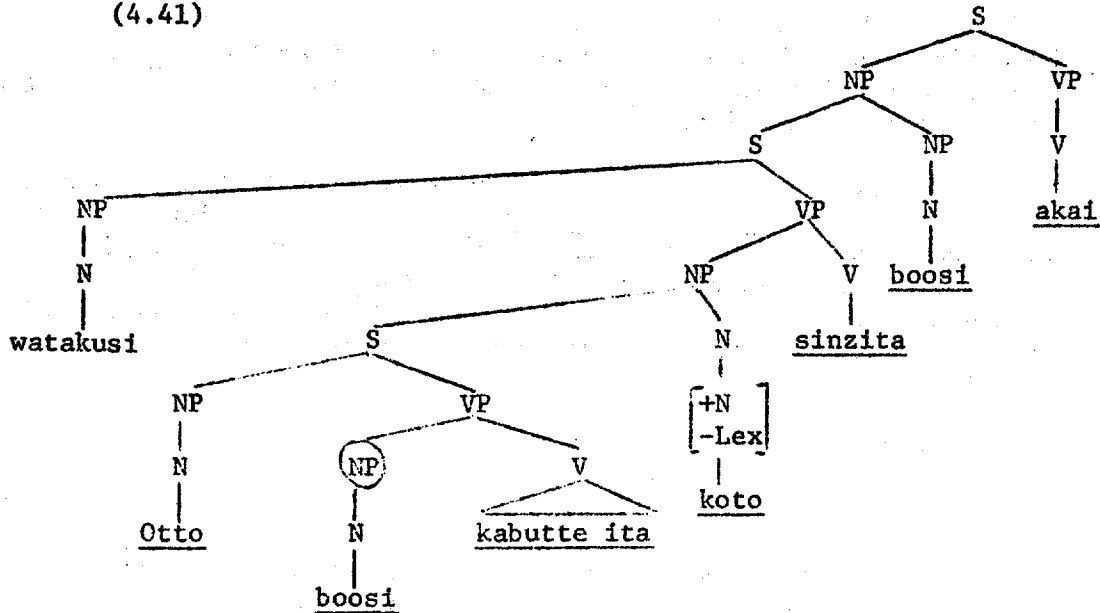
(4.40) a. *Otto ga kabutte ita to (iu syutyoo o [watakusi
 Otto wearing was that say claim I
 ga sinzita] boosi wa akai.⁸
 believed hat red
 b. 'The hat which I believed that Otto was wearing is red.'

T.E. {

The underlying structure for (4.40b) is roughly that shown in (4.41).

(4.41) a. *The hat which I believed the claim that Otto was wearing is red
 (4.40) b. The " " " that Otto was wearing " "

(4.41)



Although it is not clear to me what the deep structure for sentences like (4.39a) should be, it seems reasonable to assume that at the time the Relative Clause Formation Rule applies, the major difference between this structure and the structure which results from the deep structure of (4.39b) (the deep structure which appears in (4.41) as a relative clause on boosi 'hat') would be that the lexical noun syutyoo 'claim,' would appear in place of the non-lexical noun koto 'thing.' Thus the circled NP boosi 'hat' in (4.41) is relativizable, because the Complex NP Constraint only prohibits elements which are contained in a sentence dominated by a NP with a lexical head noun from reordering, and the Japanese nouns koto, mono, and no (if this last should be analyzed as a noun at all), which all mean roughly 'thing,' are presumably non-lexical. But nouns like syutyoo 'claim' are lexical, and therefore the Complex NP Constraint must prevent elements of sentences in apposition to them from reordering out of these sentences, as the ungrammaticality of (4.40a) shows.

*
*

To summarize briefly, what I am proposing is that the facts presented as evidence for the A-over-A principle, in Cases A and B of §2.2 -- namely that elements of relative clauses cannot be relativized or questioned, and that in general, elements of clauses in apposition to sentential nouns also cannot -- should both be accounted for by (4.20) -- the Complex NP Constraint. The fact that elements of clauses in construction with "empty" nouns like it (cf. (4.13a)) and koto 'thing' (cf. (4.40b)) can be relativized, whereas this is not possible in clauses in construction with nouns like girl (cf. (4.15)), claim (cf. (4.18a)), kodomo 'child' (cf. (4.38)), and syutyoo 'claim' (cf. (4.40a)), necessitates that the constraint be

*// stated with reference to some such feature as [+ Lexical]. I believe the Complex NP Constraint to be universal (but cf. fn. 8), although there are problems with it even in English. These will be taken up in the two sections immediately following.

4.1.5. The first difficulty with (4.20) concerns sentences like those in (4.42).

- (4.42) a. I am making the claim that the company squandered the money.
 b. I am discussing the claim that the company squandered the money.

Most speakers find NP in the position of the money not to be relativizable in (4.42b), but to be so, or at least more nearly so, in the case of (4.42a).

- (4.43) a. ? The money which I am making the claim that the company squandered amounts to \$400,000.
 b. * The money which I am discussing the claim that the company squandered amounts to \$400,000.

Sentence (4.43b) can be made even more ungrammatical by prefixing the noun claim with some possessive modifier,

- (4.44) ** The money which I am discussing Sarah's claim that the company squandered amounts to \$400,000.

and many speakers feel that while (4.43a) may not be fully grammatical, sentences like those in (4.45), whose only significant difference from (4.43a) lies in the definiteness of the article on the sentential noun (above) are completely grammatical.

- (4.45) a. The money which I have { hopes
 a feeling } that the company will squander amounts to \$400,000.
 b. The money which I will have a chance to squander amounts to \$400,000.
 c. The money which I will make a proposal { for us to squander } amounts to \$400,000.
 { that we squander }

If any of these sentences are grammatical, either condition (4.20) must be modified or abandoned, or the two sentences in (4.42) must derive from quite different sources. As it stands, (4.20) will block the generation of all the sentences in (4.43) - (4.45): in each case, the NP being relativized is contained in a sentence in apposition to a lexical head noun.

*more-arg
 "making the claim"
 = "claiming"
 we removed head
 lex noun* →

*right -
 see above //*

There is some evidence that the second alternative may be correct, i.e., that (4.20) can be preserved as is. I have not yet been able to solve various problems of rule ordering that arise in connection with this alternative, and it is only in the hope that the following incomplete analysis may suggest a correct way of distinguishing between (4.43a) and (4.43b) that I present it here.

Harris has proposed (cf. Harris (1957)) that sentences like those in (4.46) be directly transformed into the corresponding sentences in (4.47), by a rule which he calls the modal transformation.

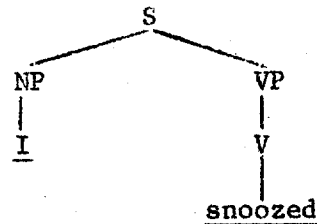
- (4.46) a. I snoozed.
 b. Sam progressed.
 c. Bill gave me \$40.
 d. Max shoved the car.
 e. I feel that Arch will show up.

- (4.47) a. I took a snooze
 b. Sam made progress.
 c. Bill made a gift to me of \$40.
 d. Max gave the car a shove.
 e. I have a feeling that Arch will show up.

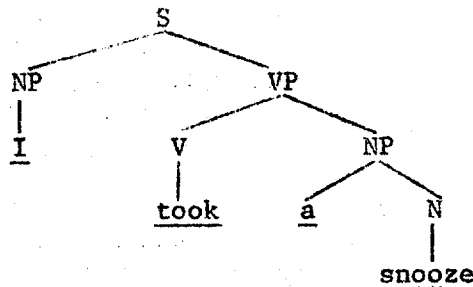
weird to make verbal elements into Ns, like "a shove" when it's so clearly Christine

Since the surface structures of (4.46a) and (4.47a) seem to be those shown in (4.48a) and (4.48b), respectively (the situation is similar with respect to the other sentences of (4.46) and (4.47)),

(4.48) a.



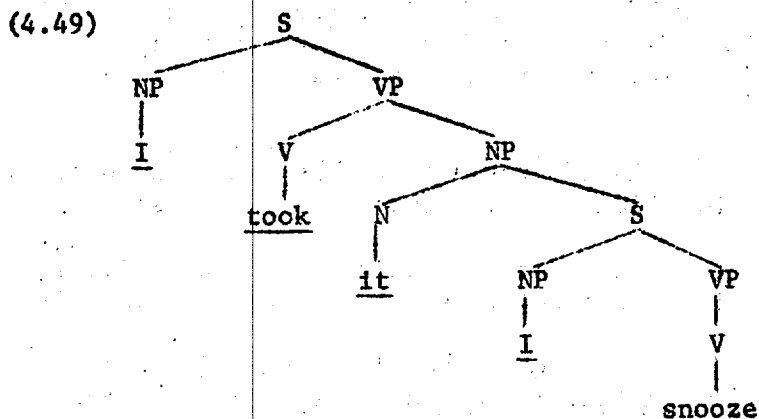
b.



* Harris' rule cannot be stated within the currently available theoretical framework, for at present, only transformations which decrease structure can be formulated. The P-marker in (4.48a) contains only one NP, but

3 possibilities
new

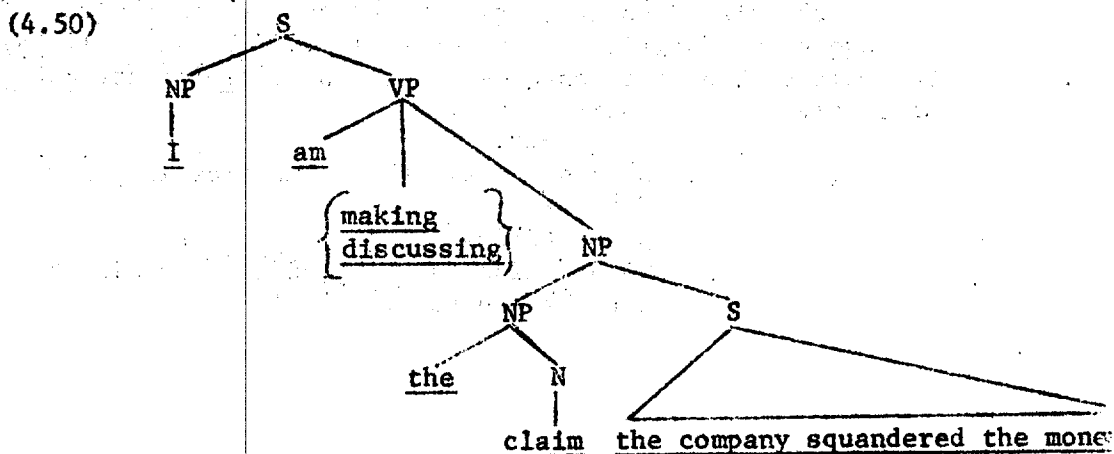
the one in (4.48b) contains two, so the present theory would not allow a direct transformational relation which converted the former into the latter (the opposite direction would be possible, of course). So, at present, in the theory of generative grammar, one could only claim (a) that the sentences are only semantically related, or (b) that (4.48b) is converted into (4.48a), or (c) that the deep structure of (4.48a) is contained in the deep structure of (4.48b), as shown in (4.49):



Proponents of this last approach would presumably argue that after the embedded subject in (4.49), I, had been deleted by Equi-NP Deletion, the verb snooze would be substituted for the abstract pronoun, it, and the indefinite article would be segmentalized⁹, yielding the structure in (4.48b).

add s.D. for this

I do not know whether any of the above analyses is correct, or whether structure-building transformations, which could convert (4.48a) directly into (4.43b), should be countenanced within the theory. But whatever analysis is adopted for the sentences in (4.47), it should also be adopted for expressions like make the claim that S, have hopes that S, have a chance to VP, etc., which were used in (4.42) and (4.45) above. If analysis (a) is correct, then both sentences in (4.42) would come from roughly the same deep structure, (4.50).



poor

But the fact that the NP the money is relativizable in (4.42a) but not in (4.42b) seems to argue against this analysis, for how can this difference be accounted for, if both sentences have roughly the same deep structure? Furthermore, there is another fact about the sentences in (4.42a) and (4.45a) which sets them off from other sentences containing sentential nouns with clauses in apposition to them. George Lakoff has pointed out to me that the rule which optionally deletes the complementizer that in clauses which follow a verb cannot apply if the verb has been substantivized. So, while both (4.51a) and (4.51b) are grammatical, only the a-version of (4.52) is possible.

- (4.51) a. Kleene proved that this set is recursive.
b. Kleene proved this set is recursive.
- (4.52) a. The proof that this set is recursive is difficult.
b. *The proof this set is recursive is difficult.

It seems to be the case that it is only in modal constructions like make the claim that S, have hopes that S, etc. that the complementizer that can be deleted after a sentential noun.

- (4.53) a. ?I am making the claim the company squandered the money.
b. I have hopes the company will squander the money.
c. I have a feeling the company will squander the money.
d. *I made a proposal we squander the money.

As (4.53d) shows, it does not seem to be the case that that can be deleted in all modal constructions -- what the restrictions are I do not know at present -- but the fact that it generally can be deleted in these constructions is another piece of evidence that argues they should be analyzed differently than such sentences as (4.42b).

* One final fact deserves mention here: to the best of my knowledge, it is only in modal constructions that sentential nouns which are related to transitive verbs cannot occur with a full range or possessive modifiers. In sentences like those in (4.54), where the main verb of the sentence containing claim is not make, any possessive NP can modify claim.

- (4.54) a. { Your
Dick's
etc. } claim that semantics is generative is preposterous.
- b. We are discussing { Myron's
their
etc. } claim that flying saucers are real.

But after the verb make, and only after it, the possessive modifier must refer back to the subject of make, if it is possible to have such a modifier at all:

*pure - cuz
is really a verb, &
only a subj can do it (?)
make the claim*

(4.55) Myron is making

}	the ?his *Suzie's *Dr. No's etc.
---	--

 claim that dead is better than red.

The same is true of all modals, as the sentences in (4.56) demonstrate.

- (4.56) a. *I have Tom's feeling that the company will squander the money.
- b. *Myra took Betty's snooze.
- c. *Bill made Sarah's gift to me of \$40.
- d. *Max gave the car Levi's shove. ✓

These three facts -- that the Complex NP constraint is not operative in modal constructions, that the complementizer that is generally deletable there, and the fact that possessive modifiers must refer back to the subject of the modal verb -- indicate clearly that sentential nouns like claim, hope, etc. which occur in these constructions must be derived differently in modal constructions than they are elsewhere.

It is tempting to propose changing the theory so that (4.48a) could be directly converted into (4.48b) by a structure-building rule of Modalization. Then the fact that elements are relativizable in complement sentences after make the claim, have hopes, etc. and the fact that that can be deleted there could be handled by ordering the rules as follows: Relative Clause Formation, That Deletion, Modalization.

Unfortunately, this solution will not work, for if there is a rule of Modalization, Passive must follow it:

(4.57) The claim that plutonium would not float was made by the freshman.

But if Passive follows Relative Clause Formation, such sentences as (4.58) will not be derivable.

issue of cyclicity here, no

(4.58) The man who was arrested by Officer McNulty went mad.

Furthermore, if Passive follows That Deletion, what is to prevent derivations like that shown in (4.59)?

maybe: { Modal (4.57)
Passive (4.58)
Rel Cl
that-del

- (4.59) a. Jack is claiming that you won't need it. \rightarrow That Deletion
 b. Jack is claiming you won't need it. \rightarrow Modalization
 c. Jack is making the claim you won't need it. \rightarrow Passive
 d. *The claim you won't need it is being made by Jack. \rightarrow Passive *not ad **

These difficulties, which I have not been able to overcome, have kept me from reaching a solution to the problem posed by the modal construction for the Complex NP Constraint. But since it seems clear that the complex sentential NP which occur in modal constructions must be derived from some other source than the sentential NP in other constructions, I have hopes that it will be possible to preserve the Complex NP Constraint in the way it was stated in (4.20). At any rate, I will not settle for merely an ad hoc rider on (4.20) until the grammar of modal constructions is considerably better understood than it is at present.

right on!

PICTURE NOUNS

4.1.6. The second difficulty concerning (4.20) arises in connection with the sentences in (4.3) and (4.4), which I will repeat below for convenience.

- (4.3) a. I read a statement which was about that man.
 b. I read a statement about that man.
 (4.4) a. *The man who I read a statement which was about is sick.
 b. The man who I read a statement about is sick.

As I pointed out in §4.1.2, it is not in general the case that elements in reduced relative clauses can be relativized or questioned: the fact that the sentences of (4.15) and (4.16) are equally ungrammatical supports this contention. How then can it be that the object of about in (4.3b) can be relativized, if (4.3b) derives from (4.3a) by way of rule of Relative Clause Reduction? = WHIZ Deletion

The tentative answer to this question which I would propose is that the relation between the sentences of (4.3) must be much more complex than has hitherto been suspected. I suspect that (4.3b) is nearer to being basic than (4.3a) is, and that in any case, (4.3b) is not derived from (4.3a) by means of the rule of Relative Clause Reduction. There are a number of peculiar facts about sentences containing nouns like statement, some of which I will take up below, which suggest the correctness of this idea.

\rightarrow

First of all, such sentences behave uniquely under reflexivization. As was shown in Lees and Klima (1963), the second of two identical noun phrases is replaced by a reflexive pronoun, subject to the condition that both NP's be in the same "simplex sentence," to use their term. They do not state how this restriction is to be expressed formally, but their meaning will be clear from the following examples:

- (4.60) a. You're going to hurt yourself one of these days.
 b. I spoke to Bill about himself.

- (4.61) a. *That Tom saw me surprised myself.
 b. *He said that himself was hungry.

Reflexivization must be blocked in (4.61), for in both cases, there is a node S which dominates one occurrence of the two NP's which does not dominate the other. Since this is not true of (4.60), Reflexivization must apply.

Consider now such sentences as those shown in (4.62)

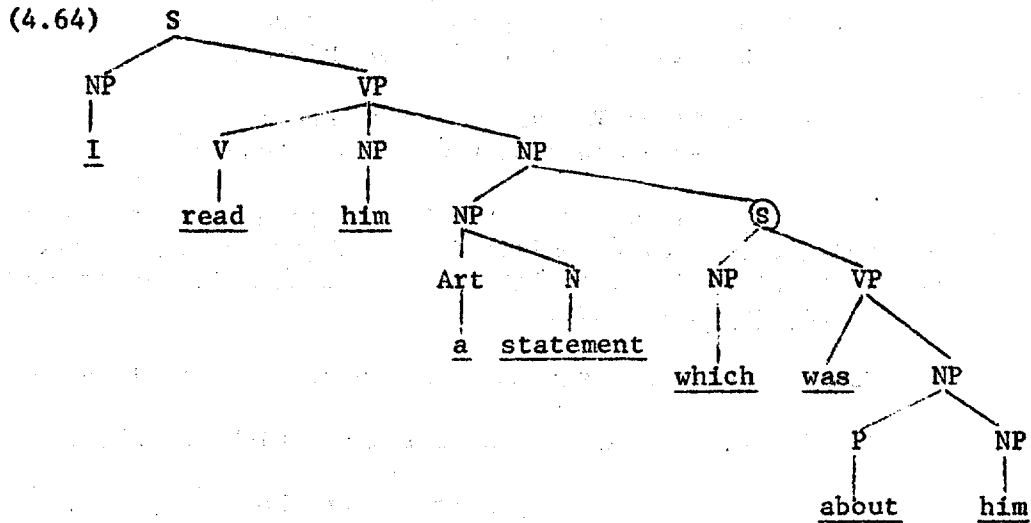
- (4.62) a. I read him_i a statement which was about $\left. \begin{array}{l} \text{him}_i \\ \text{?himself} \end{array} \right\}$.
 b. I read him_i a statement about $\left. \begin{array}{l} *him \\ \text{himself} \end{array} \right\}$.

I am not sure, but I believe (4.62a) is better, in my own speech, with a non-reflexive pronoun than with a reflexive pronoun. If there are dialects in which both of the sentences in (4.62a) are fully grammatical, I can provide no explanation of such facts, for in the overwhelming majority of cases, Reflexivization cannot go down into relative clauses, and I would not know how to characterize formally the relative clauses in sentences like (4.62a) in such a way that Reflexivization could go down into them, but not into clauses like the one shown in (4.63).

- (4.63) I know a man who hates $\left. \begin{array}{l} \text{me} \\ *myself \end{array} \right\}$.

Therefore, for the purposes of this study, let us assume, perhaps falsely, the existence of a dialect in which reflexive pronouns are absolutely excluded in (4.62a) and are absolutely necessary in (4.62b). How could we explain such facts?

Given that a meta-rule of S-pruning like (3.6) must be included in linguistic theory, on the basis of the independent evidence presented in §3.1, it might be argued that the explanation must depend in some way on this meta-rule. That is, one could assume that (4.62b) is derived from (4.62a) by the rule of Relative Clause Reduction. Reflexivization would be blocked in (4.62a), because in (4.64), which shows the approximate structure of (4.62a), the circled node S dominates the second occurrence of the NP he (him), but not the first, so the two NP's are not in the same simplex sentence.



Then, of course, as in the cases discussed in §§3.1.1 - 3.1.3, when the Relative Clause Reduction Rule deletes which was in (4.64), the circled S will no longer branch and will be pruned by (3.6), thus bringing it about that the two occurrences of he (him) are in the same simplex sentence, so that Reflexivization can convert the second one into himself.

This proposal may seem appealing at first glance, but closer scrutiny reveals that it is inadequate in a number of serious ways, and cannot, as far as I can see at present, be patched up to overcome these inadequacies. The first difficulty arises in connection with several facts which were first pointed out in two careful studies of reflexives made by Florence Warshawsky (cf. Warshawsky (1965a, b)). She pointed out that whether or not reflexivization occurs in sentences like (4.62b) is correlated in some inexplicable way with the type of determiner which precedes statement. In (4.65a), where the determiners are indefinite, reflexivization seems to be obligatory, in most dialects, whereas in (4.65b), where the determiners are possessives, they do not occur (in most dialects). With the definite articles the, this, that (4.65c), there seems to be great dialectal variation. To my ear, the sentences sound odd with or without reflexives.

(4.65) a. I read him two (several, some, no) statements about himself.

? b. *I read him Judy's statement about himself. *I read Judy Judy's statement about him*

c. ?*I read him the (this, that) statement about himself. **himse*

Clearly, no principle like (3.6) can account for the facts in (4.65) by itself -- additional conditions of some sort must be imposed on the rule of Reflexivization (these sentences will be discussed again in §6.4 below). But, it might be argued, at least the principle of

S-pruning makes it possible to state the Reflexivization Rule in such a way that reflexives are excluded from (4.62a), while at least some of them are allowed in sentences like (4.65a) and possibly (4.65c). This argument seems appealing until it is realized that normally Reflexivization does not go down into reduced relative clauses. For example, if the relative clause in (4.66a) is reduced to the phrase behind me, the NP me cannot be converted into a reflexive. The same is true of the reduced clauses jealous of you and watching me in (4.77b) and (4.78b).

- (4.66) a. I know two men who are behind me.
b. I know two men behind me (*myself).
- (4.67) a. You are too flip with people who are jealous of you.
b. You are too flip with people jealous of you (*yourself).
- (4.68) a. I screamed at some children who were watching me.
b. I screamed at some children watching me (*myself).

In fact, excluding the problem as to whether reflexive pronouns can appear in relative clauses of the type contained in (4.62a), I would hazard a guess that not only do rules of reflexivization universally not go down into relative clauses, they also do not go down into reduced relative clauses. For instance, in German, if the relative clause die ihm lieb sind 'who are kind to him' in (4.69a) is reduced to form (4.69b), the personal pronoun ihm 'him' (dat.) is not converted to the reflexive pronoun sich 'himself.'

- (4.69) a. Hans verknallt sich nur in Mädchen, die
Hans falls only for girls, who
ihm lieb sind.
him kind are.
'Hans only falls for girls who are kind to him.'
- b. Hans verknallt sich nur in [ihm liebe] Mädchen.
Hans falls only for him kind girls.
'Hans only falls for girls kind to him.'

If sich is substituted for ihm in (4.69b), as in (4.70), the sentence produced has a different meaning and is unrelated to the sentences in (4.69).

- (4.70) Hans verknallt sich nur in sich liebe Mädchen. ✓
Hans falls only for themselves kind girls.
'Hans only falls for girls who are kind to themselves.'

Thus, the most obvious explanation of the facts of (4.62), an explanation making use of the rule ordering shown in (4.71)

(4.71) Relative Clause Reduction
Reflexivization

and of some convention of S-pruning, would seem to be inadequate for the same reason that (4.5) cannot adequately account for the difference in grammaticality of the sentences in (4.4). Normally, Reflexivization does not go down into reduced relative clauses, so the fact that reflexives can occur after about in (4.62b) suggests that the about-phrase is not clausal in origin.

PICTURE/
STORY Ns

Warshawsky (op. cit.) points out that many of the nouns which can appear in the blank in (4.72) are related to verbs.

(4.72) Max showed me a _____ { of
about } himself.

A few of the verb-related nouns that occur in this environment are listed in (4.73a); several for which no corresponding verb exists are given in (4.73b). (Warshawsky gives much more extensive lists of these nouns, which she calls "picture nouns.")

- (4.73) a. description, statement, report, claim, tale,
drawing, painting, photograph, etching, sketch
b. story, column, satire, book, letter, text, article,
sentence, paragraph, chapter, picture

Warshawsky points out that the verbs associated with the nouns of (4.73a) are all verbs of creation, and the nouns systematically ambiguous with respect to whether they denote an abstract creation or some physical object upon which this creation is represented. Further, she notes that certain of these verbs can occur only with human subjects (cf. (4.74)),

(4.74) { Michael
*Michael's photograph } { painted
sketched
drew } the duck pond.

but that others could have either human subjects or picture noun subjects.

(4.75) { Michael
Michael's } { report
statement
description
story
article
book
?picture } { told of the conflict
described the country
stated that we were at fault }

This last property is unlike any other grammatical fact I have encountered. It is worth pointing out that it is not the case that any abstract noun can serve as subject of these verbs -- only picture nouns can, as is shown by the ungrammaticality of (4.76).

- (4.76) * { the space between my eyes
sentencehood
Harry's civil rights
Marilyn's arrival
etc. } *not so bad, if dramatic* { told of the conflict
described the country
stated that we were at fault }

The fact that the deverbal nouns in (4.73a) behave the same way as the apparently basic nouns in (4.73b) with respect to relativization and questioning (cf. (4.4)), reflexivization (cf. (4.62)) and with respect to the curious selectional facts pointed out in (4.75) provides strong evidence for treating all picture nouns alike. Warshawsky suggests that verbs may be basic for picture nouns, and that hypothetical verbs (cf. Lakoff (1965)) such as to story, to column, etc. be postulated as underlying the nouns of (4.73b). This proposal seems quite reasonable, but in the absence of a detailed analysis along these lines, little more can be said about it at present.

In passing, it should be remarked that there are a number of prepositional phrase adjuncts to noun phrases which exhibit similar behavior to picture nouns. As (4.16b) shows, it is not in general the case that elements of postnominal prepositional phrases can be questioned. But this is the case in the sentences of (4.77), as (4.78) shows.

- (4.77) a. I gave Tom a key { to
for } that door.
b. Harold has books by some young novelists.
c. Billy is looking for a road into the cavern.
- (4.78) a. Which door did I give Tom a key { to
for } ?
b. Which novelists does Harold have books by?
✓ c. ?Which cavern is Billy looking for a road into?

Considerations of the same sort as were discussed above would suggest that NP like a key to this door and a road into the cavern should not be derived from ?a key which is to this door and ?a road which is into the cavern, which are at best of dubious grammaticality in any event. But what their deep structures might be is at present an unsolved problem.

4.1.7. To conclude this discussion, the constraint which I stated in (4.20) correctly prevents elements of relative clauses from being questioned or relativized. The remarks of footnote 8 and §4.1.5 above

*
*
* indicate that this constraint is stated too strongly at present, and the remarks in §4.1.6 show that the differences between the sentences of (4.4), although they appear to fall within the scope of (4.20), are in fact much more complex than has been realized. I know of no other counterexamples to the Complex NP Constraint, and I therefore submit it for inclusion in the list of putative linguistic universals, subject to whatever modifications are necessary to avoid the extra strength pointed out in footnote 8 and §4.1.5.

4.2. The Coordinate Structure Constraint

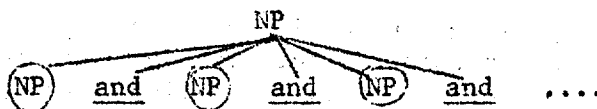
4.2.1. In §2.2, in Case F, it was pointed out that conjoined NP cannot be questioned: this was attested to by the ungrammaticality of (2.18) and (2.19), which I repeat here for convenience.

(2.18) *What sofa will be put the chair between some table and?

(2.19) *What table will be put the chair between and some sofa?

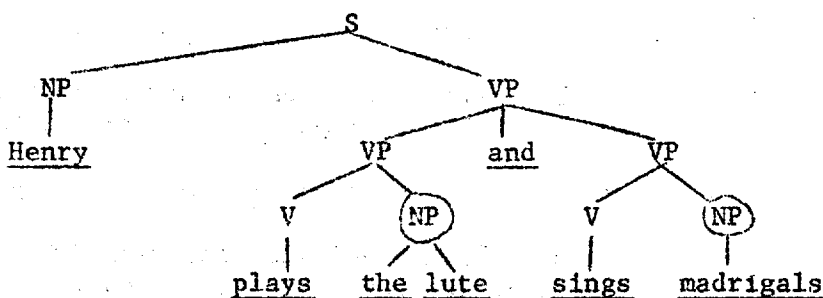
The impossibility of questioning the circled NP nodes in diagram (4.79) can be successfully accounted for by invoking the A-over-A principle,

(4.79)

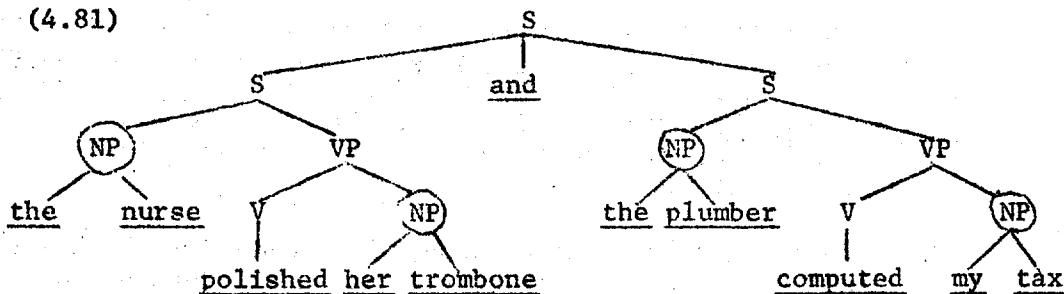


✓ but this principle does not prevent the circled NP nodes in diagrams (4.80) or (4.81) from being questioned or relativized.

(4.80)



(4.81)



But all of the circled nodes must somehow be restricted from being moved, as the ungrammatical sentences of (4.82) show.

lovely!

- (4.82) a. *The lute which Henry plays and sings madrigals is warped.
- b. *The madrigals which Henry plays the lute and sings sound lousy.
- c. *The nurse who polished her trombone and the plumber computed my tax was a blonde.
- d. *Which trombone did the nurse polish and the plumber computed my tax?
- e. *The plumber who the nurse polished her trombone and computed my tax was a hefty fellow.
- f. *Whose tax did the nurse polish her trombone and the plumber compute?

I know of no principled way of excluding such structures as those shown in (4.80) and (4.81) from being introduced as relative clauses, i.e., at the node S in (4.83),

(4.83)



so it appears to be necessary to add the following constraint to the meta-theory:

(4.84) The Coordinate Structure Constraint

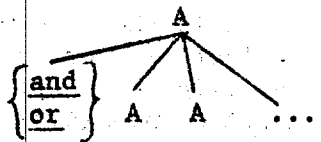
In a coordinate structure, no conjunct may be moved, nor may any element contained in a conjunct be moved out of that conjunct.

**

NOTE
DEF OF
COORD STR

4.2.2. I propose to define the notion coordinate structure as any structure conforming to the schematic diagram in (4.85).

(4.85)

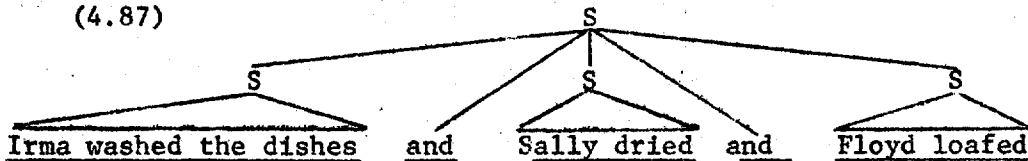


Of course, since (4.85) is intended to be a universal definition, it must be understood as containing not the English morphemes and and or, but rather a more abstract, language-independent representation of these terms¹⁰. Furthermore, the conjunction should be understood as either preceding all its conjuncts, as in English, French, etc., or as following them, as in Japanese. Coordinate structures contain at least two conjuncts, but may contain any higher number of them.

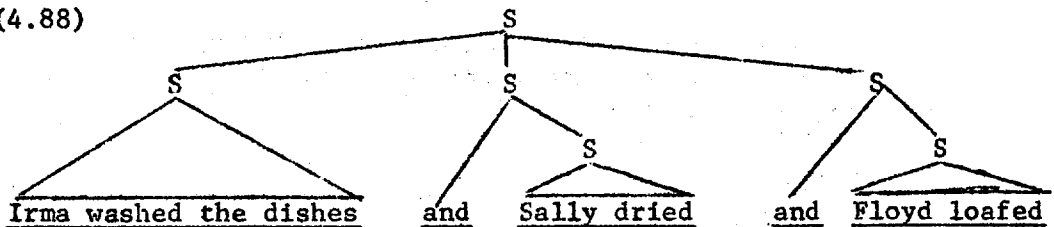
As for the deep structure position of the conjunction with respect to the conjuncts, there are many reasons for believing that the structure of (4.86) is not that shown in (4.87), but rather that shown in (4.88), where each occurrence of the conjunction and forms a constituent with the following sentence instead of being coordinate with it, as in (4.87).

(4.86) Irma washed the dishes, and Sally dried, and Floyd loafed.

(4.87)



(4.88)



One syntactic reason is that if a conjoined sentence like (4.89) is broken up into two sentences, as in (4.90), the conjunction always goes with the second sentence, as in (4.90a), never with the first, as in (4.90b).

(4.89) John left, and he didn't even say goodbye.

(4.90) a. John left. And he didn't even say goodbye.
 *b. John left and. He didn't even say goodbye.

A second syntactic reason is in that languages in which coordinating conjunctions can become enclitics, which are then inserted into one conjunct (this is the case with -que 'and' in Latin, and with the word aber 'but' in German), these enclitics are always associated with the following conjunct, never with the preceding one. Thus (4.91) may be converted into (4.92a), but not into (4.92b).

(4.91) Sie will tanzen, aber ich will nach Hause gehen.
 'She wants to dance, but I want to go home.'

(4.92) a. Sie will tanzen; ich will aber nach Hause gehen.
 b. *Sie will aber tanzen; ich will nach Hause gehen.¹¹

A third syntactic reason for regarding (4.88) as the correct structure is the following: since the Appositive Clause Formation Rule must convert sentences like (4.93a) into (4.93b) (but cf. §6.2.4.1),

- (4.93) a. Even Harold failed, and he is the smartest boy in our class.
 b. Even Harold, $\left\{ \begin{smallmatrix} \text{and he} \\ \text{who} \end{smallmatrix} \right\}$ is the smartest boy in our class, failed.

there are very general theoretical grounds for arguing that the string and he is the smartest boy in our class in (4.93a) is a constituent, for except for this case, transformations can be constrained so that only constituents may be adjoined.

Phonological evidence indicates strongly that the bracketing of the subject NP of (4.94) must be that shown in (4.95a), and not that shown in (4.95b) or (4.95c),

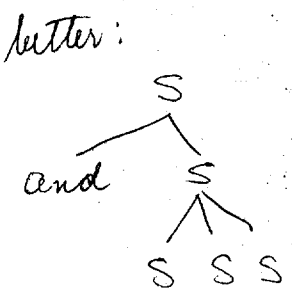
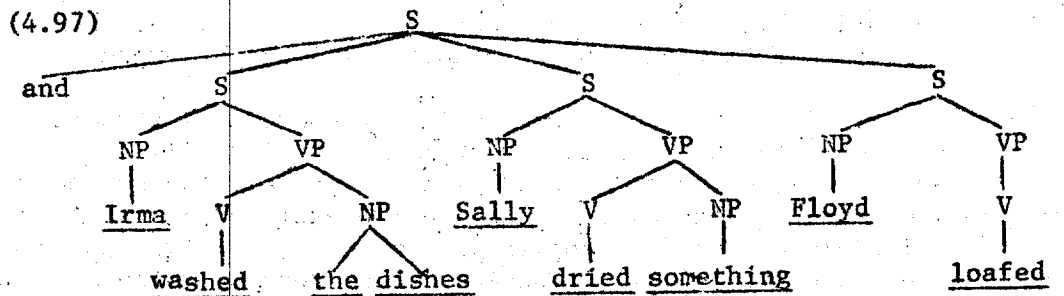
- (4.94) Tom, and Dick, and Harry all love watermelon.
 (4.95) a. ((Tom) (and Dick) (and Harry)) all love watermelon.
 b. ((Tom) (and) (Dick) (and) (Harry)) all love watermelon.
 c. ((Tom and) (Dick and) (Harry)) all love watermelon.

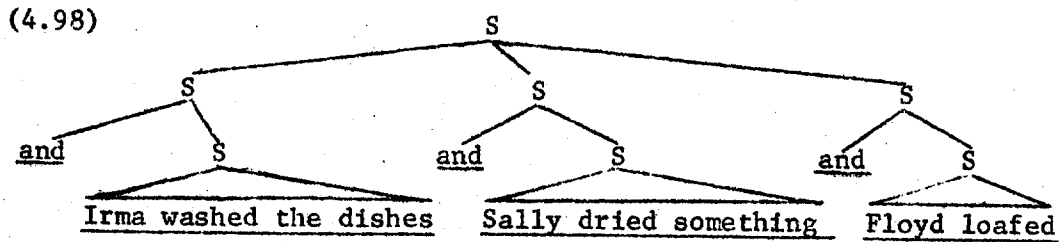
✓ for intonational pauses come before coordinating conjunctions, not after them or equally on both sides of them.

So there is good evidence to indicate that the correct structure of (4.86) must be that given in (4.88). But how does this structure arise? Lakoff and I (op. cit.) propose that there be a phrase structure rule schema like (4.96) in the base,

$$(4.96) S \rightarrow \left\{ \begin{smallmatrix} \text{and} \\ \text{or} \end{smallmatrix} \right\} S^n, \text{ where } n \geq 2$$

and that later the and or or which is introduced by (4.96) be copied and Chomsky-adjoined¹² to each of the indefinitely many S's that are introduced by (4.96) by a rule of Conjunction Copying. So the deep structure of (4.86) would be approximately that shown in (4.97), which the rule of Conjunction Copying will convert to (4.98).





✓ To derive (4.88) from (4.98), the first instance of and is deleted by a general rule which I will not state here. It is deleted obligatorily if the conjuncts are sentences, as is the case in (4.98), but it may optionally be converted into both if the conjuncts are NP, VP, or V. The rules for conjunction with or are similar in all respects, except that the initial or may be converted into either in front of all conjuncts. Languages like French, where the first ✓ conjunction does not have a suppletive alternant, provide further motivation for this analysis:

- (4.99) a. Et Jean et Pierre sont fatigués.
 and John and Peter are tired.
 'Both John and Peter are tired.'
 b. Ou Jean ou Pierre doit le faire.
 Or John or Peter must it do.
 'Either John or Peter must do it.'

One final point in favor of this analysis should be mentioned: the semantic interpretation of conjunctions, under this analysis, is much more in line with the traditional logical analysis of conjunctions, which treats them as n-place predicates, than would be the case if the previously accepted analyses were adopted. That is, if (4.97) is adopted as the deep structure of (4.86), the conjunctions and and or are only different semantically from such two-place relations as see, etc. in that the former can have an indefinitely large number of arguments, while the latter is binary. But if some such structure as (4.87) is postulated as the deep structure of (4.86), quite dissimilar projection rules will have to be constructed to interpret (4.87) semantically, and the fact that and, or, and see are semantically similar, in that all are relations, will not be expressed formally.

zavall

McCray
and *are*

4.2.3. Given the above definition of coordinate structure, the first clause of the Coordinate Structure Constraint will exclude (2.18) and (2.19), while the second will exclude all the sentences of (4.82). The latter sentences could neither be excluded by the A-over-A principle nor by the Complex NP Constraint of §4.1, so it appears that condition (4.84) is necessary for reasons which are independent of the problems raised by (2.18) and (2.19). Thus (4.84) can be used to explain their ungrammaticality, just as the A-over-A principle was.