ANALYSES OF NEGATION IN ENGLISH

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ABSTRACT

This thesis is an attempt to give a unified account of the syntax and semantics of negation, and in particular, of the lexical item not. Two analyses are presented and discussed: the first providing for the deep structure occurrence of not in the specifier of adverbials and noun phrases and deep structure interpretation of the scope of negation, and the second providing for generation of not in sentence initial position and derived structure scope interpretation. It is argued that the second analysis provides a better description of two adverbial classes that are superficially parallel but differ in significant syntactic and semantic respects. Further, it is suggested that a comprehensive theory of scope semantics would require derived structure scope interpretive rules. The semantics of the quantifier any are considered and Quine's proposal that any is the universal quantifier is supported, and evidence is presented that its distribution can be predicted if it is regarded as the marked form of the universal quantifier. Finally, the analysis of Lakoff and Carden and that of Jackendoff are considered. The former is shown to be untenable, and the latter is shown to be unable to account for some of the phenomena discussed.

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This thesis is dedicated to my parents

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CHAPTER 0

INTRODUCTION

For several years, negation has been one of the most extensively discussed topics in generative grammar, and the subject of a great deal of important work. Klima's 1964 paper, "Negation in English," for example, is surely one of the most careful and complete syntactic analyses ever attempted. Its influence pervades many of the analyses in Chapter I of this thesis. More recently, the scope semantics of negation has been extensively discussed in a number of papers by Jackendoff, Lakoff, Carden, and others. Although significant insights have been presented in those works, no attempt has been made at formulating a unified theory of negation. In general, this is quite understandable. Klima was working in a framework in which semantics was not an issue. Hence his goal, which he attained to a remarkable degree, was to account for the distribution of morphemes in sentences classed as 'negative' by syntactic criteria. The Katz-Postal hypothesis, that meaning can be determined at the level of deep structure, had not yet been formulated, so Klima, unlike later investigators, was not constrained to take a stand on whether transformations involving negative sentences preserve meaning. Jackendoff and Lakoff, on the other hand, seem to have been concerned only peripherally with the syntactic regularities constituting the realm of Klima's study. Their principal concern, in a number of papers, has been scope semantics.

The present thesis is a modest first step towards a synthesis of the two lines of research.

In Chapter I, my concerns are basically those of Klima, that is, the syntactic description of sentences. I discuss several distributional phenomena, many of which were first noted by Klima, and I propose two distinct analyses. In the Determiner Theory, not is potentially generated in the auxiliary and in the specifier of noun phrases and adverbials. In the Pre-S Theory, not is again generated in the Aux, but its second position is pre-sentential. I show that both analyses can account for two facts not noticed by Klima: 1) that there are grammatical sentences containing both sentence initial and auxiliary occurrences of not, e.g., "Not many of the arrows didn't hit the target"; 2) that in general, sentences with an occurrence of not to the right of the verb tend to be much worse than one would a priori expect -- *"I attend class not always". I argue that the behavior of one class of adverbials, including not long ago, provides evidence in favor of the Pre-S analysis.

Chapter II is an attempt to integrate the respective syntactic analyses into semantic analyses. One rather surprising result is that within the Determiner Theory, the core scope data, including many of the examples discussed by Lakoff and Jackendoff, can be assigned interpretation at the level of deep structure, without the need for either a derived structure interpretive rule or a global derivational constraint. It is the new syntactic analysis proposed in I.1

that provides the basis for this simplified semantic theory. However, principally on the basis of the syntactic and semantic behavior of the adverbial class mentioned above, I conclude that the Pre-S analysis, with its derived structure interpretive rule, is more adequate. In the course of the discussion, I formulate an interpretive rule and suggest that it applies at the end of each syntactic cycle. I then discuss any, which I argue is an instance of the universal quantifier, and suggest that any is always semantically outside the scope of negation in negative sentences, and, in fact, always outside the scope of its 'trigger'.

Finally, in Chapter III, I examine the important work of two investigators of the scope semantics of not, Lakoff and Jackendoff. I show that the deep structures proposed by Lakoff (and by Carden) are unacceptable; that important syntactic and semantic generalizations are missed in their analyses; and that Lakoff's arguments for his proposals are not only incorrect but actually prove the opposite of his claims. I discuss Jackendoff's analysis in much less detail because the area of disagreement between Jackendoff and myself is far smaller. I show that his formulation of a scope rule is faulty, however, and that his analysis of the operation of the rule is incorrect in detail.

CHAPTER I

THE SYNTAX OF NOT

In this chapter, I intend to examine the distribution of the lexical item not in surface structure, and the implications of this distribution for the base rules and transformations involved in sentences containing not. In the course of the discussion, two syntactic schemas will be presented. In the first, which I call the Determiner Theory, not is generated on NP's and Adverbials and, in some circumstances, transformationally relocated into the Aux. In the second, the Pre-S Theory, not is generated in a "pre-S" node as in Klima (1964). Both analyses will be shown to require an Auxiliary base position for not.

I will first consider phrases containing not and a quantifier, for example not many and not often. One logical possibility is that the base rules can generate determiners on noun phrases of the form not + Quantifier, and adverbials of the form not + adverb, and that only the rules normally involving NP's and adverbs apply to such NP's. I will argue that this possibility is untenable. Consider the following pair of sentences.

1 *The students solved not all of the problems

2 Not all of the problems were solved by the students

Sentence 1 is particularly interesting because it is fully interpretable and seems potentially quite a useful construction, but my intuition is that there is something wrong with it. In general, when a sentence is interpretable and violates no selectional restrictions, but still seems to be a "bad" sentence, I will assume that the syntax fails to generate it. I will assign * to such a sentence.

Suppose that not is generated on noun phrases and the syntax has no transformations affecting that not. Then in order to account for the contrast between 1 and 2, a condition on the passive transformation would be required making passive obligatory just in case the object NP has not in its determiner.

Now consider sentences 3 and 4.

3 Not everyone saw the play

4 *The play was seen by not everyone

4, like 1, is grammatical if not is absent. To rule out sentence 4, another condition on the passive transformation would be required stipulating that just in case the subject NP has not in its determiner, the transformation blocks. A similar, but even more problematic case arises with verbs that generally resist passivization, such as want. Sentence 5 is analogous to 1 and 4 in its ungrammaticality, but 5 produces an ungrammatical sentence even if it is passivized. Hence, within the analysis under discussion, the well-formed

deep structure underlying 5 and 6 produces only ill-formed surface structures.

5 *John wants not many books

6 *Not many books are wanted by John

In sentence 2, not all of the problems seems to be a constituent. Since 1 is ungrammatical, this constituent has no apparent source. Similarly, in sentence 3, not everyone seems to be a constituent. But if the passive transformation operates on this constituent, the resulting string is ungrammatical. Note that when not is absent, sentences corresponding to 1 through 4 are all grammatical.

1' The students solved all of the problems

2' All of the problems were solved by the students

3' Everyone saw the play

4' The play was seen by everyone

In the above sentences, the constituent with not can only occur in subject position, while the corresponding constituent without not can occur freely.

Consider now the adverb often. There are three major positions where often can occur, indicated by 8, 9, and 10.

8 Often, I cut astronomy class

9 I often cut astronomy class

10 I cut astronomy class often

Not often is a potential constituent, since most speakers accept sentences like 11.

11 Not often do I cut astronomy class

But in the non-initial adverb positions, not often is ungrammatical:

12 *I not often cut astronomy class

13 *I cut astronomy class not often

On the surface, then, not all adverb positions are available to adverbs with not. In particular, just as only subject position permitted not+Quant+NP, only initial position permits not+adverb. I claim that these two facts are elements of the same phenomenon, and that significant generalizations would be missed if the rules of passive and adverb movement were constrained so as to be obligatory or prohibited just in case the wrong choice would produce one of the proscribed outputs I have described.

An alternative to constraining the transformations in various ad hoc ways is to hypothesize various lexicalization rules that are optional in subject or initial adverb position but obligatory elsewhere. Such an analysis would have transformational rules like the following.

14 not many ⟶ few [opticnal in subject position]

15 not often ⟶ seldom [optional in initial position]

This proposal faces several difficulties, some of them apparently insurmountable. First, sentence 1 above is ungrammatical because its object has the determiner not all. But in this case, the ungrammaticality cannot be accounted for by making some lexicalization rule obligatory, because not all has no corresponding single lexical item. Similarly, there are no single lexical items corresponding to the phrases not every, not always. Further, even the phrases that do have similar lexical items, as in 14 and 15, raise several difficulties, since not many and few, for example, differ in significant syntactic ways. Few can be modified in ways that not many cannot as the correspondences below show.

16 rather few *rather not many
surprisingly few *surprisingly not many

Similarly, seldom occurs in frames in which not often cannot occur.

17 rather seldom *rather not often

Also, few can be compared, while the corresponding phrase cannot.

18	fewer	*not many-er
		*more not many
	fewest	*not many-est
		*most not many

Finally, not many and not often can be modified in ways that do not correspond to any modification of few and seldom. Not very many, for example, is quite different from very few, and not very often is not equivalent to very seldom. But the not phrases so modified behave syntactically just like the unmodified phrases in examples 1 - 13 above. That is, such phrases are ungrammatical except in initial position, even though the structural description for the hypothesized obligatory lexicalization transformation is presumably never met.

19 *I cut classes not very often

20 *The police arrested not very many of the demonstrators

21 *The desired answer was given by not very many of the witnesses

On the basis of 16 - 20, I conclude that the ungrammatical

sentences I have presented cannot be accounted for by a lexicalization transformation changing phrases with not into single lexical items.

Klima (1964) suggested that not is generated sentence-initially, dominated by a node labelled Pre-S. The Pre-S deep structure position for not would then be the source of not in the examples I have been discussing. This proposal has many virtues in the description of the syntax of sentences with not, but it has one major shortcoming. In particular, it fails to account for grammatical sentences with two occurrences of not. Examples of this phenomenon are sentences 22 and 23.

22 Not many of the arrows didn't hit the target

23 Not many of the demonstrators weren't arrested

24 Not often do I not do my homework

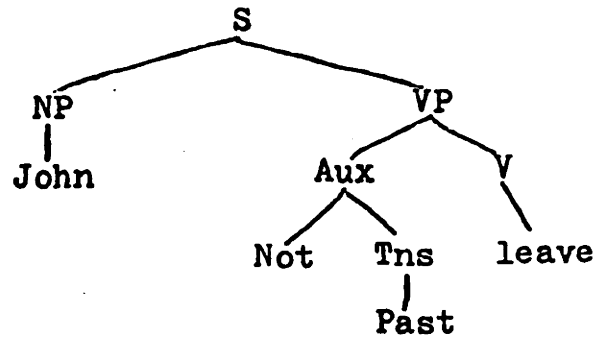
22 and 23 suggest that at least two deep structure sources for not are required, one of them in the Auxiliary. I propose that the base rules expanding Aux can optionally generate not in the initial position of the Aux, and I will argue that such a base rule underlies the occurrence of not in 25.

25 John didn't leave

The relevant aspects of the deep structure for 25 are

represented in 26.

26



Some statistical confirmation of the relative grammaticality judgements I have been using as evidence appears in Whitman (1971). In this interesting study, Whitman tabulates acceptability judgements concerning various syntactic frames with not. One of the results is that not on an NP to the right of the verb, i.e. on an object or prepositional NP, produces the least acceptable sentences.

In general, he finds that an increase in the number of not's tends to decrease acceptability. But even allowing for this fact, sentences with a not on the subject and one in the Aux are far more acceptable than sentences with only one not if that not is in object position. Sentence W1 obtained twice as many acceptable ratings as W2, 14 against 7 on one sample.

W1 Not many people weren't shocked by the events at My Lai

W2 That girl has been kissed by not many boys

Even W3, a sentence of considerable apparent complexity, had twice as many acceptable ratings as W2, again, 14 against 7.

W3 Not many girls don't like Rock Hudson, do they?

Further, when a sentence pattern involving an object not is compounded by a second not, the resulting sentence is universally rejected. W4 received only one acceptable rating out of 24 responses, and W5 received no acceptable ratings.

W4 Not many girls like not many boys

W5 John didn't see not many girls

Whitman collected interpretability judgements, as well, which are not, unfortunately, reported in his note. Significantly, however, he states that a sizeable proportion of the relatively unacceptable judgements were judged to be relatively easily understood. It seems quite likely that such sentences as W2 above fall into that category.

I turn now to a discussion of the deep structure source of not in phrases like not many and not often. I will examine two theories, which I call the Determiner Theory (DT) and the Pre-S Theory (PT), respectively.

1 Determiner Theory

In the Determiner Theory (DT), not is generated optionally

in the determiner of Noun Phrases and certain types of Adverbial Phrases. The presence of <u>not</u> in the determiner of a NP, for example, would be contingent upon other aspects of the form of the determiner. 27 would be a possible deep structure under either option, but 28 would be excluded by subcategorization.

27 (not) many people

28 *not people

The determiner of a count noun could include 29, then.

29 $((\text{not}) \begin{Bmatrix} \text{many} \\ \text{every} \\ \text{all} \\ \text{a lot of} \end{Bmatrix})$

The determiner of a mass noun, similarly, could include 30.

30 $((\text{not}) \begin{Bmatrix} \text{much} \\ \text{all} \\ \text{a lot of} \end{Bmatrix})$

Determiners generated by the base rule underlying 29 appear in sentences 31.

31 a. Not many people arrived

b. Not every student passed the test

c. Not all of the analyses were acceptable

d. Not a lot of demonstrators were arrested

The determiners in 30 appear in sentences 32.

32 a. Not much foliage survived the frost

b. Not all of the crops were destroyed

c. Not a lot of thought went into your explanation

The first problem facing DT is illustrated by examples 1 - 4 above. In particular, a phrase generated by 29 or 30 can be the subject of a passivized sentence, but not the object of an active sentence. And such a phrase can be the subject of an active sentence but not the by-phrase of a passive one. This distribution of facts can be accounted for within DT by a transformation ordered after passive, and whose operation is obligatory, which would shift a not occurring in the determiner of a NP to the right of the Aux into the Aux. 33 is an approximate statement of this transformation which I will call Not Shift.

33 Not Shift

$$NP - [\text{Tense-etc.}]_{Aux} - [\text{Verb} - [\text{not-etc.}]_{NP}]_{VP} - \text{etc.} \longrightarrow$$
$$1 \quad 2 \quad 3 \quad 4 \quad 5 \quad 6 \quad 7$$

$$1 - 5+2 - 3 - 4 - 6 - 7$$

By the operation of 33, a determiner not becomes the first element of the Aux. This formulation is consistent with the

theory developed by Emonds (1970) which is usually called the structure preserving hypothesis. This is so because not moves into a position that is a possible deep structure position for it, as in 26. If the rule which moves not into second position in the Aux (which I will call Aux Adjustment) is ordered after Not Shift, the final form of the Aux will be the same whether not is generated in the Aux or transformationally relocated there. I will illustrate Not Shift and Aux Adjustment with some sample derivations. For a discussion of Do Support and Contraction see Klima (1963).

34	Deep Structure	Jim	not	past	leave
	Aux Adjustment	"	past	not	leave
	Do Support	"	did	not	leave
	Contraction	"	didn't		leave

35	D.S.	Jim	past	solve	not	many	problems
	Not Shift	"	not	past	solve	many	problems
	A.A.	"	past	not	"	"	"
	Do Support	"	did	not	"	"	"
	Contraction	"	didn't		"	"	"

If passive is elected on D.S. 35, then Not Shift, Aux Adjust, and Do Support will all be inapplicable. The output in this case will be 36.

36 Not many of the problems were solved by Jim

Now consider a deep structure with <u>not</u> in the determiner of the subject.

37 Not many of the students will solve this problem

If passive is not elected, none of the above transformations apply, and in all relevant respects, the surface structure is the same as the deep structure. If passive is elected, its output will meet the structural description of Not Shift.

38 This problem will be solved by not many of the students

38 will ultimately produce 39.

39 This problem won't be solved by many of the students

Structures with <u>not</u> generated in both the Aux and the determiner of the object NP create an apparent difficulty for the DT analysis. 40, for example, produces the acceptable sentence 41 if passivized.

40 *The police didn't arrest not many of the demonstrators

41 Not many of the demonstrators weren't arrested...

But if 40 is not passivized, there is no possible grammatical output.

42 *The police not didn't arrest many of the demonstrators

43 *The police didn't not arrest many of the demonstrators

I claim that the lack of a grammatical output for 40 is not a real difficulty but follows naturally from the structure preserving hypothesis. I have stated that Not Shift is obligatory. Since there is only one Aux position for not, the derivation that would produce 42 or 43 blocks, since the target of the movement is already filled.

The distribution of adverbs with not can be handled by the same devices. For the purposes of this discussion, I will assume that the relevant adverbs are generated sentence-finally and are transformationally fronted, but the structure of the argument will be unaffected if the reverse turns out to be the case.

Just as not is generated in the determiner of NP's, under the DT analysis, it is generated in the specifier of certain Adverbial Phrases. Thus, the initial AP's in the following sentences represent deep structure constituents.

44 Not often do I cut astronomy class

45 Not because he loves her does George beat his wife

46 Not in order to become rich did John become a linguist

However, such adverbials can occur sentence-finally only when not is absent.

47 I cut astronomy class (*not) often

48 George beats his wife (*not) because he loves her

49 John became a linguist (*not) in order to become rich

If Not Shift is extended to apply to Adv P's, as well as NP's, and is ordered after Adverb Fronting, the starred forms of 47 - 49 will never be generated, but instead will obligatorily be transformed into 50 - 52.

50 I don't cut astronomy class often

51 George doesn't beat his wife because he loves' her

52 John didn't become a linguist in order to become rich

One further set of relevant syntactic phenomena is

illustrated by sentences 44 - 46 above. The generalization covering those sentences is that when the particular set of adverbs under discussion have not in their determiner, the fronting of the adverbial phrase fulfills the environment for Subject Auxiliary Inversion (SAI). One consequence of this observation, which I note in passing, is that Adverb Fronting must precede SAI.

2 Pre-S Theory

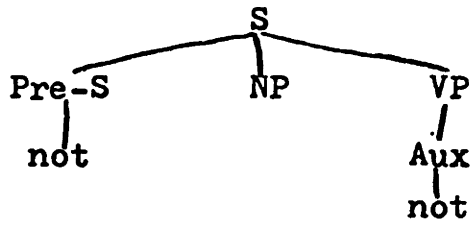
Examples 1 - 10 above demonstrate that not can generally only appear on a quantifier or adverbial in sentence-initial position. The Determiner Theory I have described uses an obligatory movement transformation to obtain that distribution. Here, I will present an alternative analysis in which that not occurs sentence-initially because it is generated sentence-initially.

Like DT, Pre-ST requires a phrase structure rule generating not in the auxiliary. Unlike in DT, however, in the analysis I will now present, not occurs in the Aux only when it is there in the base. The second base position for not will be sentence-initial: with Klima (1964), I will call this second position the Pre-Sentence. The phrase structure rules involved are given in 53, with irrelevant nodes omitted.

53 Aux $\longrightarrow$ (not) tense ...
S $\longrightarrow$ Pre-S NP VP
Pre-S $\longrightarrow$ (not) ...

Below, these phrase structure rules will be modified; at present, they are sufficiently correct to illustrate my basic arguments. The two possible positions for not are shown in tree diagram 54.

54



Both not's occur in sentence 22 above, which I reproduce here.

22 Not many of the arrows didn't hit the target

Under this analysis, no special transformation is required to account for the non-occurrence of sentences with not-phrases in other than initial position. This is so because not occurring on quantifiers or adverbials is generated sentence initially, and is never transformationally relocated. The ungrammaticality of 55 and 56 is thus accounted for in a straightforward manner.

55 *The target was hit by not all of the arrows

56 *I attend lectures not often

It is my intuition that strings such as not many men,

not often are surface structure constituents. I have no conclusive syntactic arguments that this is the case, but I will assume that they are constituents by some stage in the derivation. To produce such derived structures, I propose that there is a late rule, perhaps more an "adjustment rule" than a transformation, that re-brackets sentences with initial not. By the operation of this rule, which I will call Not Adjustment (NA), not is incorporated into the first constituent to its right. Not Adjustment clearly must follow all transformations relocating adverbials and NP's. It must follow Passive, for example, to exclude 55 above and to allow 57.

57 Not all of the targets were hit

Similarly, Not Adjustment must follow the rule of adverb movement, regardless of whether adverbs are preposed or extraposed, in order to exclude 56 above while allowing 58, its grammatical counterpart.

58 Not often do I attend lectures

One obvious difficulty for PT, as I have thus far sketched it, is the ungrammaticality of 59.

59 *Not John left

For the Determiner Theory discussed earlier, 59 is no problem, since not would be generated in the constituent in which it occurs. Thus, the DT base rules would exclude 59. In the Pre-ST, however, there can be no such base mechanism, since not is generated in Pre-S position. In Chapter II, I will argue that this problem is basically a semantic one. That is, when not is incorporated into a constituent, there are semantic consequences; and as a result, most types of NP's, and certain adverbials, are incompatible with not. I see no purely syntactic way to explain the fact that universal quantifiers, 'many' quantifiers, and motivational adverbials like those in 45 and 46 permit the occurrence of not while other NP modifiers, and many adverbial types, exclude it. One might want to argue that the distribution can be explained if NA puts not into the first constituent to its right if possible, and into the Aux otherwise. But that would still leave unsolved the problem of distinguishing a possible determiner position from an impossible one.

Note that sentences like 59 become grammatical if they undergo Gapping, as in 60.

60 Bill left, not John

The contrast between 61 and 62 illustrates the same point.

61 Bill saw Harry, not Harry Bill

62 *Not Harry saw Bill

Such contrasts suggest an ordering argument. If I am correct in my statement that 59's ungrammaticality stems from the semantic incompatibility of incorporated not with the subject NP of the example, then in such sentences as 60 and 61, it must be the case that Not Adjustment has not applied. If the structural description for NA is 63, the correct results will be obtained, since 60 and 61 will then not be subject to the rule.

$$63 \quad \text{not} - \begin{Bmatrix} \text{NP} \\ \text{Adv} \end{Bmatrix} - X - \text{Verb} - Y$$

63 guarantees that gapped sentences will never be subject to Not Adjustment, and thus will not be filtered out by the misapplication of the rule. Consistent with that mechanism is the observation that while such a phrase as not many men seems intuitively to be a constituent, not Harry in 61 above does not seem to be one.

Since Not Adjustment must 'know' whether a verb is present in its input string, according to 63, I conclude that it must follow the Gapping transformation. I assume that Gapping does not apply until the cycle which includes both conjuncts; this implies that NA is last- or post- cyclic.

The ordering of NA that I just argued for is contingent upon the assumption that Gapping is a syntactic transformation, in particular, a deletion rule. It may be the case that Gapping is not a transformation, but rather, an interpretive rule, in the sense of Wasow (1972). In that

case, gapped structures would be generated in the base with the non-occurring material present as non-phonetically specified (or delta) nodes. The readings for the deltas would be supplied by the operation of an interpretive rule. I do not intend to explore here the arguments that might be relevant to deciding between the two positions. I only want to point out that if Gapping is interpretive, the ordering argument I gave above does not apply, and NA could just as well be ordered at the end of each syntactic cycle. In Chapter II, I will discuss some of the implications of the respective orderings.

Earlier, I discussed the ungrammaticality of sentences in which <u>not Adv</u> occurs in non-initial position. Examples 47 - 49 above illustrate this phenomenon. Not all such sentences are ungrammatical, however. In the following paragraphs, I will present examples of adverbs with <u>not</u> which can occur freely in sentences, and I will show how such cases provide strong support for the Pre-S analysis.

Consider the following examples.

64 I was a student not long ago

65 I have a summer cabin not far from here

66 I cut class not infrequently

67 *I eat lunch not always.

Within the Pre-ST, 67 represents the standard situation. Since <u>not</u> is generated sentence-initially and not transfor-

mationally relocated, always can have not connected to it only if always appears in pre-subject position. In passing, I wish to point out that 64 - 66 make it unlikely that the ungrammaticality of sentences like 67 can be described, as I have occasionally heard suggested, by an output condition. This is so because at the level of surface structure, there is no obvious way in which the two types are distinct. Following Klima (1964), I suggest that e.g. 66 and 67 are to be distinguished in deep structure. I have argued that the not occurring in 68 is generated in the pre-S, and transformationally incorporated into the adverb node.

68 Not $\left\{\begin{matrix}\text{always}\\\text{often}\end{matrix}\right\}$ do I attend class

The difference between 64 - 66 above and 68 can be explained if not in 64 - 66 is not generated sentence-initially, but rather is generated, by the phrase structure rules, within the adverbial in which it appears.

My proposal that not is an optional modifier in a certain class of adverbial constructions is supported by the fact that the relevant adverbials have the same distribution with or without not. Compare 69 with 70.

69 John decided (not) long ago to become a linguist

70 John (*not) often attends class

A more significant difference between the adverbial classes was pointed out by Klima. He observed that when the adverbials in 64 - 66 are preposed, no subject-aux inversion occurs, as is evidenced by the contrast between 71 and 72.

71 Not long ago, John decided to become a linguist

72 Not often does John attend class

Thus, one can generalize that the not-adverbials that are generated 'whole' can occur freely throughout the sentence and do not trigger SAI. Derived not adverbial constructions such as not often, on the other hand, occur only sentence-initially and require inversion.

I have shown how Pre-ST explains the differing distributions of two classes of adverbials containing not, a phenomenon left unexplained by the analyses of Lakoff and of Jackendoff reviewed in Chapter III, and also left unexplained by the Determiner Theory presented earlier in this chapter. Before proceeding to a discussion of Subject-aux inversion within Pre-ST, and sentences like 71 and 72 above in particular, I will summarize the phenomena under consideration and give representative examples of the two adverbial types in table 73.

73 a. Phrases arising through incorporation of Pre-S not

--occur only S initially

--trigger inversion

not often
always
every day
many times
on many occasions ⟶
on not many occasions

until...
even then

because...
(in order) to...
for any reason
under any conditions
under any circumstances

b. Phrases 'generated whole'

--free distribution

--don't trigger inversion

not long ago
" after
" before

far from here
" away

infrequently
unexpectedly
unnaturally
unreasonably
uncommonly
unjustly

surprisingly

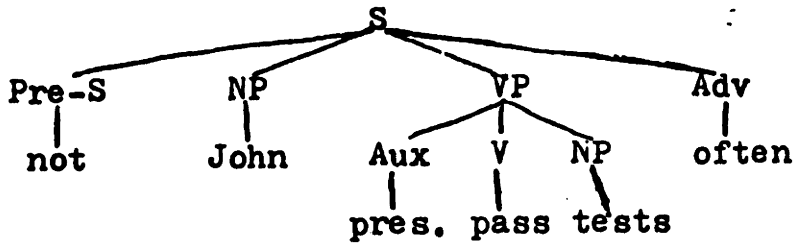
I don't intend to explore the nature of the b. class here, though there are obvious semantic generalizations lurking in the list. The a. class, which I will examine in Chapter II, seems to be principally composed of adverbials with an overt or inherent quantifier, and motivational adverbs. Given that there are two distinct classes, the fact that Pre-ST provides a natural way of distinguishing them provides strong support for the analysis.

I turn now to an examination of Subject-aux inversion, in which I will show that the divergent patterning of the a. and b. classes can again be naturally explained. Consider first sentences 74 and 75 with deep structures 74' and 75' respectively.

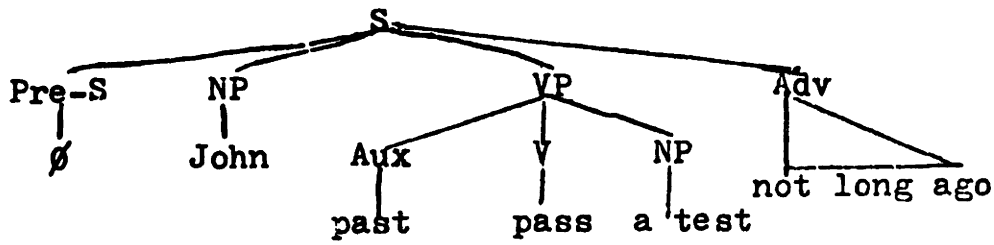
74 Not often does John pass tests

75 Not long ago, John passed a test

74'

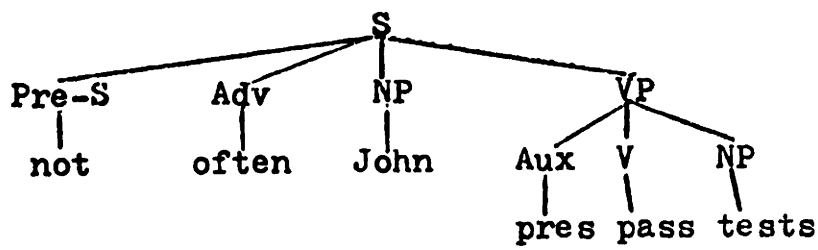


75'

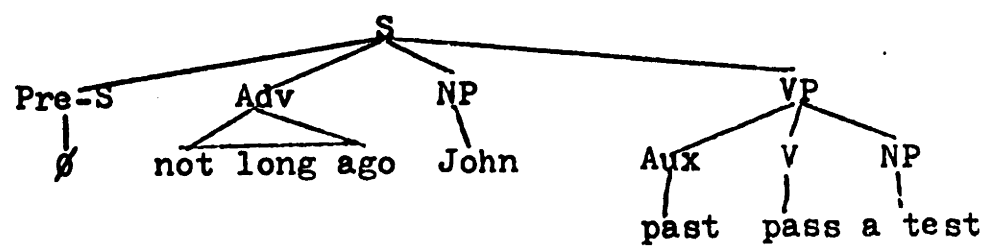


Adverb fronting will produce 74" and 75".

74"



75"



If Subject-Aux inversion is ordered before Not Adjustment, SAI can be made sensitive to the difference between <u>not</u>

dominated by Pre-S and <u>not</u> dominated by Adverb. In particular, the structural description of the transformation will require a Pre-S <u>not</u>. For my present purposes, SAI can be stated as 76 (though it will be slightly modified later).

$$76 \quad [\text{not}]_{\text{Pre-S}} - \text{Adv} - \text{NP} - \text{tense} \left(\left\{\begin{matrix}\text{modal}\\ \text{have}\\ \text{be}\end{matrix}\right\}\right) - \text{X}$$

$$1 \qquad 2 \quad 3 \qquad 4 \qquad 5 \quad =$$

$$1 \qquad 2 \quad 4 \qquad 3 \quad 5$$

Rule 76 will apply to phrase marker 74" producing sentence 74, "Not often does John pass tests." But 76 will not apply to 75", since its structural description is not met. Finally, Not Adjustment will apply to the inverted structure rebracketing Pre-S <u>not</u> into the adverb. With this ordering, it is possible to reflect the intuition that <u>not often</u> is a surface structure constituent, while capturing the generalization about inversion. The ordering on the last cycle of the rules I have thus far discussed in connection with the Pre-S theory is the following (assuming that Gapping is a transformation).

77 a. Adverb Fronting
b. Subject-Aux Inversion
c. Not Adjustment
d. Gapping

a. precedes b. b. precedes c. d. precedes c.

If Gapping is interpretive, in the sense defined above, then Not Adjustment can by cyclic. Otherwise, it must be last- or post-cyclic.

There is one important problem which I have avoided and which I have no satisfactory explanation for: that inherently negative adverbials such as seldom and rarely trigger inversion just as overt not does. This fact could, perhaps, be described by attributing a feature +not to such adverbs, and making SAI sensitive to that feature. Two obvious shortcomings of such a proposal are first, that the feature has no clear independent syntactic motivation; and second, that the generalization that the trigger for SAI is in the Pre-S will have to be abandoned. An alternative possibility, suggested to me by Morris Halle (personal communication), is that of generating the relevant adverbials in the Pre-S in the position where not would be generated. The expansion of the Pre-S would then include 78.

78 Pre-S $\longrightarrow$ Neg

Neg $\longrightarrow$ { not, seldom, rarely, etc. }

Rule 76 would then refer to Neg rather than to not. If these negative adverbs are generated only under Neg, there is a straightforward explanation for the non-occurrence of such phrases as *not seldom.

I turn now to a consideration of the nature of the node

that I have been calling the Pre-S. I have already argued that when not is not generated in the Aux it can generally only appear in the left-most NP or Adverb in surface structure. Here I will examine further restrictions on its distribution and suggest their implications.

Thus far, I have suggested that significant generalizations can be captured concerning the distribution of not and the occurrence of Subject-Aux Inversion if that lexical item is generated in sentence-initial position rather than within NP's and Adverbials. A further consideration of these phenomena will indicate that the Pre-S may actually be the Complementizer node, in the sense of Bresnan (1970). The properties of rule 76 above, SAI, are one relevant consideration. First, notice that WH questions display behavior quite parallel to that of negative sentences, as Klima (1964) observed. Sentence 79 is an example:

79 When was John arrested?

Klima argued that the inversion evidenced in such sentences as 79 is attributable to a question morpheme WH generated in the Pre-S position. In Bresnan (1970), several arguments are presented that in the deep structure there is a Complementizer node, in which Poss-ing and For-to, for example, are generated. In the course of her presentation, she argues persuasively that WH is a complementizer as well, and is generated in that Comp node. Since I have argued that not

should be generated sentence-initially, and since not and WH behave similarly with respect to inversion, it seems a reasonable extension of the analysis to generate not in the Complementizer as well.

The strongest sort of evidence for the Complementizer status of not would be the impossibility of its co-occurrence with independently motivated complementizers. I have no clear data of this sort, but in the following paragraphs, I will present some suggestive examples.

Consider the following examples.

80 That everyone passed the exam surprised me

81 Everyone's passing the exam surprised me

80 and 81 are synonymous, and both seem fully grammatical. The following parallel pair display an interesting divergence in grammaticality.

82 That not everyone passed the exam surprised me

83 *Not everyone's passing the exam surprised me

The ungrammaticality of 83 is presumably not due to its meaning, since if it were grammatical, it would be synonymous to the grammatical 82. I tentatively conclude that the syntax fails to generate 83. In so-called Pseudo-cleft constructions, the same grammaticality judgements obtain, as 81' and 83' demonstrate.

81' What surprised me was everyone's passing the exam

83' *What surprised me was not everyone's passing the exam

Note that the badness of 83 and 83' is not simply the result of the general fact that possessivized NP's diminish in acceptability with increasing length of the NP. This is evidenced by the fact that 84 and 85, both of which have modified quantifier subject NP's, are substantially better than 83'.

84 What surprised me was almost everyone's passing the exam

85 What surprised me was virtually noone's passing the exam

The above sentences suggest, then, that sentence-initial not can co-occur with the that complementizer but not with the Poss-ing complementizer.

Similar, though less certain, judgments obtain for the For-to complementizer. Here, too, I will assign the sentence with not a *, though I concede that it is not as obviously ungrammatical as 83'.

86 Everyone will pass the exam

87 For everyone to pass the exam would be entirely unprecedented

88 Not everyone will pass the exam

89 *For not everyone to pass the exam would be unprecedented

Thus, there is some evidence that the For-to complementizer is also incompatible with sentence-initial not. Again, note that other quantifier modifiers are permitted in that position, as in 90.

90 For hardly anyone to pass the exam would be a catastrophe

Bresnan (1972) gives overwhelming evidence for the existence of an infinitival complementizer independent of the For-to complementizer. One diagnostic test for For-to is the pseudo-cleft construction, which forces the occurrence of for even in the complements of verbs like want that generally delete it. Compare 91 and 92.

91 I want (*for) capitalism to die

92 What I want is for capitalism to die

But there is a whole class of verbs taking infinitival complements, which cannot fit into a pseudo-cleft frame at all. Believe and cognitive verbs in general are of this type.

93 *What I believe is (for) capitalism to have died

Compare 93 with 94:

94 What I believe is that capitalism died

The reader is referred to Bresnan's paper for many other arguments for the existence of an independent infinitival complementizer. The relevance of Bresnan's arguments to the present discussion lies in the fact that "bare" infinitival complements also seem incompatible with sentence-initial not. Thus, 95 corresponds to 96, but 98 is ungrammatical.

95 I proved that all of John's claims are correct

96 I proved all of John's claims to be correct

97 I proved that not all of John's claims are correct

98 *I proved not all of John's claims to be correct

Within the Pre-S theory I have been exploring in this section, I tentatively conclude that Pre-S is not an independent node, but rather a part of the complementizer node. The fact that there is at least some evidence that not can co-occur with certain of the complementizers provides motivation for generating not as an alternative to them. Two

possible schemas suggest themselves. First, the phrase structure rule expanding Comp might include 99.

$$99 \quad \text{Comp} \longrightarrow \left\{ \begin{array}{l} \text{Poss-ing} \\ \text{For-to} \\ \text{-to} \\ \text{that (not)} \end{array} \right\}$$

The fact that not vacates Comp position by the operation of the Not Adjustment rule is consistent with a second phrase structure possibility for the structure of the complementizer. 99 is not particularly revealing, since not could just as easily occur with one of the other complementizers. That is, 99 provides no explanation for the fact that only that freely occurs with sentence-initial not. A proposal of Bresnan (1970) may be relevant in this regard. Bresnan suggests that that is not present in the deep structure, but rather is the "zero" complementizer. That is, when no complementizer is generated, a rule fills in that in embedded sentences, under certain circumstances. If her suggestion is correct, 99 can be replaced by 100.

$$100 \quad \text{Comp} \longrightarrow \left\{ \begin{array}{l} \text{Poss-ing} \\ \text{For-to} \\ \text{-to} \\ \text{not} \\ \emptyset \end{array} \right\}$$

After not vacates Comp position, that can be inserted, just as if Comp had been generated empty. The advantage of this proposal is that it would no longer be an accident that not

can only occur with <u>that</u>. Since the other complementizers are present in deep structure, their occurrence possibilities will not be affected by transformational rules.

CHAPTER II

SOME ASPECTS OF THE SEMANTICS OF NEGATION

Semantic 'scope' of negation will be the primary issue investigated in this chapter. I will discuss the circumstances under which something can be negated, and I will examine the meaning of negated items. In the first section, I will discuss a range of phenomena involving negation and its interaction with quantifiers and adverbs. Then, the examples will be related to the two syntactic analyses I presented in Chapter I. In Chapter I, I did not choose between the Determiner Theory and the Pre-S Theory; here I will discuss evidence relevant to a choice between them, and I will suggest that the Pre-S analysis has greater explanatory adequacy.

The Scope of Negation

A first consideration must be the discussion of a diagnostic test for determining when an item is being negated, i.e., when it is within the scope of negation. In this regard, compare sentences 1 and 2.

1 Many people saw the movie

2 Not many people saw the movie

One obvious difference between 1 and 2 is that the quantifier in 1 can make specific reference while the one in 2

cannot. Thus, 1' is a possible extension of 1, but 2' is ill-formed.

1' Many people (namely, John, Bill, Mary, etc.) saw the movie

2' *Not many people (namely...) saw the movie

Similarly, definite pronominalization produces odd sentences, when the referent is a negated quantifier phrase. 2" seems bad in the same way that 2' is.

1" Many people saw the movie. They enjoyed it.

2" Not many people saw the movie. *They enjoyed it.

Now notice that on one reading, in fact on the primary reading, 3 is synonymous with 2.

3 The movie wasn't seen by many people

Semantically, 3 can have the same unit, <u>not many</u>, that is present in 2. Apparently, it is not necessary, then, that <u>not</u> and <u>many</u> be in the same constituent in order for them to be related thus creating the semantic unit <u>not many</u>.

When <u>not</u> is not immediately contiguous to <u>many</u>, however, it is possible for <u>many</u> to escape the negating influence of <u>not</u>. Both 5 and 6 are possible paraphrases of 4, but in 6 it is evident that <u>many</u> is outside the scope of negation.

4 I couldn't solve many of the problems

5 I could solve few of the problems

6 There were many of the problems that I couldn't solve

5 is a direct contradiction of 4'.

4' I could solve many of the problems

But 6 and 4' can be simultaneously true, if, for example, half of the problems were solved.

The normal reading of 4 is 5, but with a special intonation in which "I couldn't solve" is a phonetic phrase, and "many of the problems" is an independent phrase, the latter is isolated from the negation. I will give a more precise description of that phenomenon below. That there is the potential for isolating object position from the scope of negation is made clear by the existence of sentences like 7.

7 I couldn't solve several of the problems

Several in sentence 7 can always make reference in the sense discussed above. Hence several must be outside the scope of negation. A quantifier immediately following not can never be isolated from the latter's scope. That is, sentence 8 must be synonymous to 9: it can never have the type of

ambiguity that 4 above displays.

8 Not many of the problems were solved

9 Few of the problems were solved

Since certain quantifiers, for example several and some, will always be non-negated in object position, one would predict that they cannot occur at all immediately following not, since in that position a quantifier will always be negated. That prediction is correct, as example 10 demonstrates.

10 *Not {several / some} of the problems were solved

The following two generalizations describe the data I have thus far presented:

11 a. A quantifier immediately following not is obligatorily negated, and consequently the NP it quantifies can never be referential.

b. In general, a quantifier following not, but not immediately, can be non-negated if the sentence has a special intonation contour.

The scope of negation is not symmetric. If a quantifier occurs to the left of not, it will be outside the scope of

negation (with one class of exceptions which I will return to). Sentence 12, for example, will never be synonymous to sentence 8 above.

12 Many of the problems weren't solved

[The quantifiers all and every constitute exceptions to two of the above three generalizations. If either of them is substituted for many in 7 above, object position will obligatorily be negated.

7' I couldn't solve all of the problems

7' cannot mean 'It is true of all of the problems that I couldn't solve them'. Further those two totality quantifiers can be negated even when they precede not, as illustrated by 7".

7" All that glitters isn't gold

I have no idea why this should be the case.]

Another basic limitation on the scope of negation is that an element can only be in the scope of negation if it is commanded by a negative morpheme. In sentences 13 and 14, many is outside the scope of negation even though not precedes it.

13 The man who didn't eat dinner saw many people

14 That John didn't leave surprised many people

There is no reading of either of those sentences in which not is semantically associated with many. These facts are incorporated with 11 above in 15.

15 a If not commands a quantifier and precedes it, that quantifier can be within the scope of negation

b If not immediately precedes a quantifier, that quantifier must be within the scope of negation

It is usually the case that the distribution of any and some parallels the respective distribution of negated and non-negated quantifiers. Thus, some cannot occur immediately following not, as in example 10 above, since that position is always in the scope of negation. Likewise, a large subset of the possible positions of any can be described as positions that can be in the scope. If many is replaced by any in 12, 13, and 14 -- examples in which many is non-negated -- the results are all ungrammatical.

12' *Any of the problems weren't solved

13' *The man who didn't eat dinner saw any people

14' *That John didn't leave surprised any people

In a later section, I will explore the semantic implications of that distribution. At present, it is sufficient simply to note the parallel between negated many and any. In both cases, the quantifier cannot be used to make reference. Thus, if a quantifier has a distributional relationship to not as defined by 15, that quantifier's NP will necessarily be non-referential.

Quantificational adverbs display scope behavior very similar to that I have been discussing. In sentence 16, but not in 17, not is semantically associated with often, creating a semantic unit synonymous with seldom.

16 Often, demonstrators are arrested

17 Not often are demonstrators arrested

As Jackendoff (1971) has observed, in sentences like 16 often can be used to refer to particular instances. Not often cannot be so used. When not commands and precedes often but is separated from it by intervening material, the latter can escape from the scope of the negation. Again, a special intonation in which the remainder of the sentence constitutes an intonational phrase from which the quantifier is isolated is associated with such an 'escape'. Usually, a comma is the orthographic indication of that intonation, in the case of adverbs. In example 18, the comma indicates that often is non-negated.

18 I don't attend class(,) often

The same quantifiers that must be non-negated in object position will also be non-negated in adverbials. In the following examples, I will use the notation [-neg] to indicate that a quantifier is outside the scope of negation, and consequently that the phrase it contains can be referential. [+neg] will indicate that a quantifier is within the scope and consequently that its phrase cannot be referential.

19 I didn't attend several of the scheduled lec-
-neg
tures

19' I didn't attend the scheduled lectures on
several occasions
-neg

20 I didn't attend many of the scheduled lectures
± neg

21' I didn't attend the scheduled lectures on
many occasions
± neg

The parallel between quantifiers in those two positions suggests that the scope facts are part of the same phenomenon and should be treated in the same way.

Motivational adverbials, e.g., <u>because</u> clauses, interact with negation in the same way that the frequency adverbials I have discussed do. In Lakoff (1965), and more extensively in Lasnik (1970), the ambiguity of sentence 21 is discussed.

21 George doesn't beat his wife because he loves her

21 has two readings: in one reading, corresponding to sentence 22, the adverbial is negated while the remainder of the sentence is presupposed; in the alternative reading, the matrix verb is negated, as in 23.

22 Not because he loves her does George beat his wife

23 Because he loves her, George doesn't beat his wife

One could extend the notion of scope of negation to account for that ambiguity. In 22, the <u>because</u> clause is necessarily within the scope of negation, while in 23, it is outside the scope. This is parallel to 16 and 17 above and falls under principle 15 above. Similarly, the adverbial in 21 will not necessarily be in the scope, since it is not immediately preceded by <u>not</u>. Sentence 21 is disambiguated by intonation just as 4 and 18 were. When the negatable item is made an independent intonational phrase, it will be outside the scope of negation. As was the case in 18, a comma is the orthographic indication of such an intonation, which disambiguates 21 towards 23.

Another example of the same phenomenon is sentence 24.

24 Senator Eastland doesn't grow cotton(,) to make money

Without a comma, 24 could be continued, "Rather, he grows cotton out of a love for the soil." In that case, 24 is synonymous with 25.

25 Not (in order) to make money does Eastland grow cotton

The alternative possibility, in which 24 has an intonation pattern in which the sentence independent of the adverbial has a full sentence contour, is synonymous with 26.

26 (In order) to make money, Eastland doesn't grow cotton

That is, he is paid for not growing cotton.

Though the scope facts are parallel, the semantic correlation between 21 and the previous cases is not very clear. In the case of quantified NP's, and even in the case of frequency adverbials, it makes some sense to think of the non-negated phrase as being potentially referential, as Jackendoff (1971) suggested. I can think of no correlate of referentiality that would be relevant for motivational clauses. Hence, I will not exclude the possibility that negation of such clauses is an independent process.

One significant factor about the scope of not, which I will discuss at some length later, is that it is constrained by the possessivized NP island. (I discussed that phenomenon in Lasnik (1971b).) To illustrate this point, I first present sentence 27, which has an ambiguous scope of negation.

27 I couldn't understand the proofs of many of the theorems

If "many of the theorems" is inside the scope of negation, 27 will be synonymous with 28. If it is outside, 29 will be the correct paraphrase.

28 I could understand the proofs of few of the theorems

29 There are many of the theorems whose proofs I couldn't understand

In general, it will be possible to relate not occurring in auxiliary position to a quantifier on the direct object. If the direct object has a 'subject', i.e., a possessive determiner, however, it is no longer possible for a quantifier in the object to be negated. Consider sentence 30.

30 I couldn't understand Euclid's proofs of many of the theorems

30 has no reading analogous to 28. It does have a reading corresponding to 29, in which the quantifier is non-negated; sentence 31 is a paraphrase of 30.

31 There are many of the theorems whose proofs by Euclid I couldn't understand

The following two sentences are a further example:

32 You didn't understand the proofs of enough of the theorems for me to be justified in giving you an A

33 *You didn't understand Euclid's proofs of enough of the theorems for me to be justified in giving you an A

An examination of the meaning of 32 shows that <u>enough</u> has to be understood as negated for the sentence to make sense. The content is something like "You understand the proofs of some theorems, but not enough...". 32, then, has no reading in which <u>enough</u> is outside the scope of negation. As would be expected, 33 is anomalous, since the required linking of <u>not</u> and <u>enough</u> is prohibited, as in the analogous sentence 30.

Before turning to a consideration of how the two syntactic theories proposed in Chapter I might be able to account for the basic scope phenomena I have outlined, I will briefly summarize the results thus far. First, when a quantifier

is within the scope of not, the NP quantified by it cannot be referential; one illustration of that is the fact that such an NP cannot be the antecedent of a definite pronoun. Second, the scope of not depends crucially upon precede and command relationships. Only if not commands a quantifier (or adverbial) can that quantifier (or adverbial) be in not's scope; and even then only if not precedes it. When not does not immediately precede an element, in general it will be possible for that element to be outside the scope of not. Finally, at least one island constraint, namely the possessivized NP constraint, is relevant to the determination of scope. A quantifier within that island will not be subject to the influence if not outside of it. How these generalizations can be most naturally captured will be the major concern of the following two sections.

1 Scope and the Determiner Theory

One of the most striking facts about possible scope of negation is that an adverbial or quantifier that can be interpreted as negated by an auxiliary occurrence of not will almost invariably allow not to occur in its determiner. Further, those quantifiers and phrases that exclude not in their modifiers preclude negated readings when not is in the auxiliary.

34 G. doesn't beat his wife (because he loves her)
can be negated

34' Not because he loves her does G. beat his wife

35 They couldn't solve (many of the problems)
can be negated

35' Not many problems were solved

36 The problems weren't solved by (everyone)
can be negated

36' Not everyone solved the problems

37 Eastland doesn't grow cotton (to make money)
can be negated

37' Not to make money does Eastland grow cotton

38 John doesn't attend demonstrations (often)
can be negated

38' Not often does J. attend demonstrations

Contrast 34-38 with the following examples:

39 I couldn't solve (several of the problems) =
non-negated
Several weren't solved

39' *Not several of the problems were solved

40 The target wasn't hit by (some of the arrows) =
non-negated
Some arrows missed

40' *Not some of the arrows hit the target

41 I didn't attend the scheduled lectures
(on {several / a number of} occasions)
non-negated

41' *Not on {several / a number of} occasions did I attend...

41" *On not {several / a number of} occasions did I attend...

The above paradigm provides the basis for an argument

for DT. Recall that DT allows for the generation of not in the determiners of NP's and AdvP's, as well as in the auxiliary. An obligatory transformation, Not Shift, follows all of the Adverb and NP movement rules on each cycle, and repositions a determiner not that is to the right of the Aux into the Aux. I contend that if such a theory can be motivated, the interpretation of the scope of not can take place at the level of deep structure, and that no derivational constraint or derived structure interpretive rule will be required for such cases.

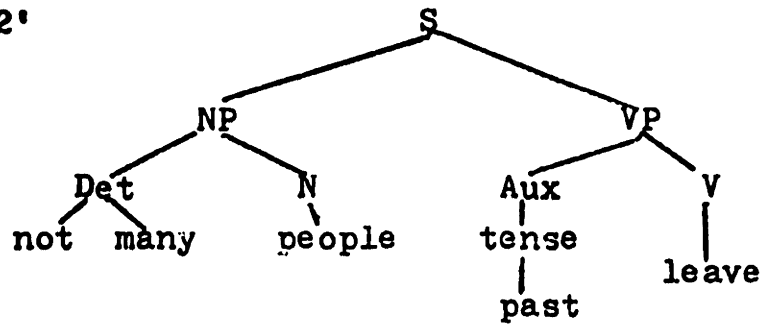
Consider the following tentative proposal: An element is negated (in the sense discussed earlier in this chapter) if and only if not is present in its determiner in deep structure. The description of the following sentences then becomes straightforward.

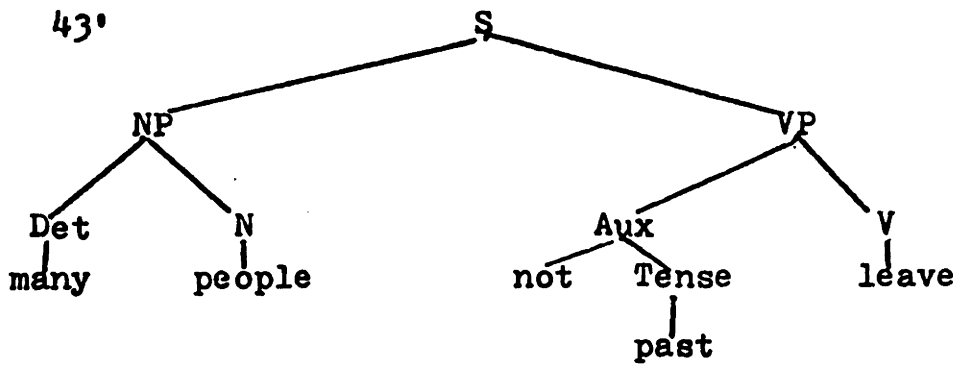
42 Not many people left

43 Many people didn't leave

The relevant aspects of the underlying representations of 42 and 43 are given in 42' and 43' respectively.

42'





The interpretive proposal will correctly interpret many as being negated in 42, since in its deep structure 42', not is present in the determiner. In 43', the deep structure of 43, not is absent in the determiner; hence many in 43 will be non-negated. Note that it is correctly predicted that neither 42 nor 43 will have a scope ambiguity. This is so because the Determiner Theory outlined in Chapter I has no transformations moving not into determiners of NP's; and it has no transformations moving not rightwards into the Aux. Hence there is no possible deep structure for 42 in which not is absent in the determiner of the subject NP. Similarly, there is no possible deep structure for 43 in which not is present in the determiner of the subject.

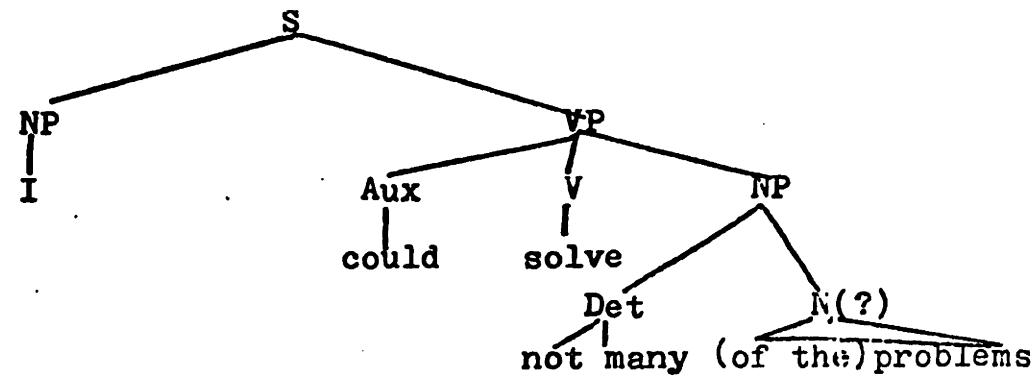
The crucial case is the ambiguous sentence 4.

4 I couldn't solve many of the problems

Here, there is one reading in which many is within the scope of not, that is, it is understood as negated. And there is a second reading, when the sentence has the abnormal

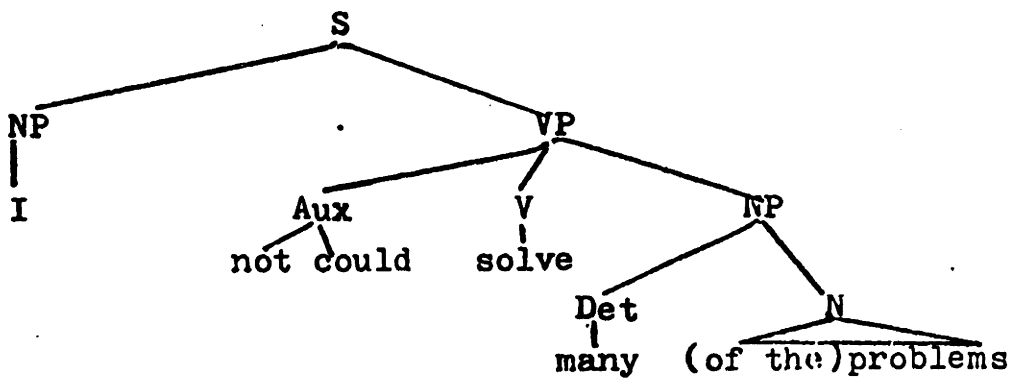
intonation mentioned earlier, in which many is non-negated and, in the terminology I have been using, potentially referential. The first reading, in which many is negated, arises from the following deep structure, in the DT.

44



Not Shift and Auxiliary Adjustment will apply, in that order, to produce sentence 4. The alternative reading, where many is non-negated, comes from deep structure 45, in which not is not associated with many.

45

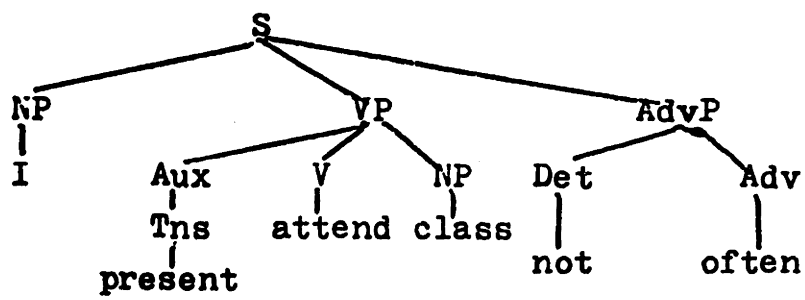


Here, only Aux Adjustment will be relevant: its application will produce the surface string 4. Note that after Not Shift applies to 44, 44 and 45 will be identical. If

interpretation is accomplished in the manner I have sketched, the non-ambiguity of such sentences as 39 above can be simply accounted for. There will be no negated reading of <u>some</u> or <u>several</u> precisely because <u>not</u> can never co-occur with those quantifiers.

The sentences with adverbials presented above can be explained in an analogous fashion. There will be two underlying representations for sentence 18, for example. In one of them, <u>not</u> will be generated in the determiner of <u>often</u>, and the latter will be interpreted as negated. This is illustrated in 46.

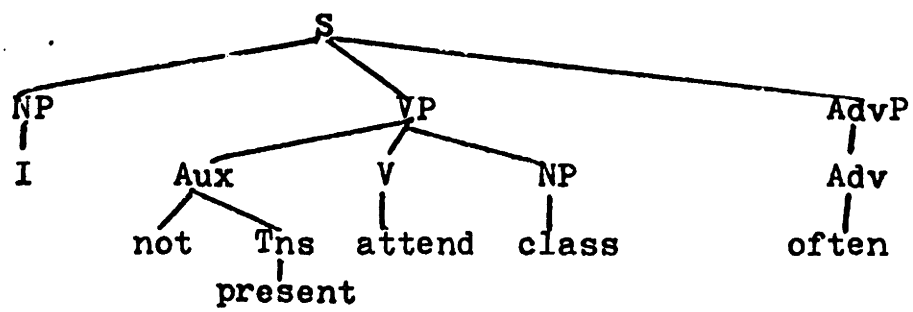
46



Not Shift, Aux Adjustment, and Do Support will apply, producing the correct surface form, sentence 18.

For <u>often</u> to be interpreted as non-negated, <u>not</u> will be generated in the Aux, as in 47.

47



The Aux adjustment and Do Support transformations will apply to 47 to produce sentence 18.

Earlier in this chapter, I pointed out that there are structural limitations on the negation of a quantifier. One such limitation, illustrated by sentence 30, is that a quantifier within a possessivized NP can not be negated by a quantifier outside the NP, even if the precede and command requirements are fulfilled.

30 I couldn't understand Euclid's proofs of many of the theorems

If Euclid's is replaced by the, as in 27 above, many can be either negated or not; but the former possibility does not exist in 30. This fact is predicted by the Determiner Theory. If a quantifier is only negated when not appears with it in deep structure [that not subsequently being repositioned by the operation of Not Shift], 30 can only have the interpretation in which not is not associated with many. The deep structure in which not originates in the NP will not be able to produce 30, since Not Shift will be constrained from moving not out of the possessivized NP island. (It should be remembered that since Not Shift is obligatory, that deep structure will not produce any grammatical output.)

Thus far, I have sketched how scope will be determined in the DT, and I have suggested what might be semantically involved in the negation of a quantifier or frequency

adverbial. In 45 and 47, however, the relevant quantifier is outside the scope of not. Thus, the question arises as to what is being negated in such cases. Since that is a problem common to both analyses I will develop, I postpone a discussion of it until I have presented the Pre-S theory.

The virtues of DT are fairly obvious. First, with very little mechanism, it accounts for the distribution of not as outlined in Chapter I. Second, the scope of not can be read directly off the deep structure, and all transformations can apply freely without making reference to that scope. The analysis does have some serious shortcomings, however. Here I will mention the more significant ones, which I will return to in the following section where I will show that the Pre-S theory eliminates the difficulties.

Earlier, I noted that when a negatable constituent to the right of not is outside the scope of negation, the situation is, in some sense, marked. Sentence 4, for example, requires a special intonation contour for many to be non-negated. The required intonation pattern in sentence 18 where often is to be understood as outside the scope of not is not abnormal in quite the same way that the intonation of 4 is. Nonetheless, when 18 is one intonational phrase, with rising intonation until the end of the sentence, often is understood as negated. Often must be independent of the basic intonational phrase in the sentence to be non-negated. It is not unreasonable to regard such a contour as marked relative to the norm. DT, however, has no direct way of

accounting for that assymetry. That is, there is no a priori reason to expect that it is more natural to generate not in the determiner of a quantifier than it is to generate it in the Aux, given that the phrase structure rules permit both possibilities. Further, it is not clear how the stress and intonation rules could provide necessarily independent contours corresponding to the two scope possibilities, particularly since such prosodic rules apparently would apply after Not Shift has neutralized the difference between the two underlying phrase markers. That is, DT provides no general way of linking interpretation and intonation. But sentences 4, 18, and 24 above demonstrate that there is a strong relationship between scope and intonation. This is a major problem that would have to be solved before DT could be accepted. In the following section, "Scope and the Pre-S Theory", I will show that the Pre-S analysis can systematically describe the relationship.

A second difficulty with DT is that there is no mechanism for guaranteeing the non-ambiguity of sentence 48, given the rule formulations presented in Chapter I.

48 I don't often attend class

48 is only synonymous with 49; never with 50.

49 Not often do I attend class

50 Often, I don't attend class

In terms of DT, this fact requires that 48 only be derivable from deep structure 46. That is, no derivation originating with 47 can produce 48. But if the adverbial node can in 46 be transformationally repositioned into the Aux, presumably the one in 47 can also be so repositioned, unless some restriction, apparently ad hoc, is put on the adverb movement rule. It may be the case that this difficulty is related to the first difficulty I discussed, namely the inability of DT to predict the close association between intonation contour and scope. I proposed the generalization that a negatable item to the right of not will be outside the scope of not just in case it is outside of the intonational phrase including not. I will return to this point in my discussion of the Pre-S theory. For the present, I merely suggest the possibility that often is necessarily negated in 48 because there is no possible intonational phrase which includes not but excludes often.

Finally, DT would require some extension, the nature of which is not clear, to account for the important fact noted by Klima that there are two different classes of adverbials with not. In Chapter I, I discussed some of the differences between not often and not long ago, for example. The former, but not the latter, meets the structural description of Subject Aux Inversion, as 50 and 51 show.

50 Not often do I attend class *Not often, I attend class

51 Not long ago, I attended class *Not long ago did I attend class

Another difference is that not long ago, unlike not often, can occur sentence finally.

52 I attended class not long ago

53 *I attended class not often

Thus, the syntax must somehow capture the fact that not in not long ago is entirely internal to the adverbial, while in not often its influence reaches the whole sentence. Further, this syntactic fact parallels the semantic fact that not long ago doesn't have a meaning corresponding to the negation of an adverbial (or to a negative adverb -- it is nearly synonymous with recently). Earlier, I used Jackendoff's terminology in describing the scope of not. With him, I suggested that an adverb in the scope of not will be necessarily 'non-referential.' Thus 50 feels like a non sequitur since not often is at least partially referentially specified.

54 *Not often do I attend class. For example, I attended on Monday.

However, neither 55 nor 56 is strange in that way.

55 Often, I attend class. I attended on Monday.

56 Not long ago, I attended class. I attended on Monday.

The problem can be easily summarized: transformations will treat adverbials like not often differently from those like not long ago; and the semantics of the two types are quite different. But in DT, their deep structures will apparently be of the same type, leaving the differences unexplained. I will show in the following section that the Pre-S analysis can neatly distinguish the two classes, with the result that important generalizations can be captured.

2 Scope and the Pre-S Theory

In the preceding section, I showed how the scope of not might be interpreted in the deep structure in a manner consistent with the Determiner Theory of the syntax of not outlined in Chapter I. In this section, I will explore the possibility of an interpretive system consistent with the Pre-S Theory also discussed in Chapter I. In the course of the presentation, I will argue that the difficulties encountered by DT do not arise in the alternative analysis.

It should be evident that there is no natural way that the scope of not can be determined in deep structure within the Pre-S analysis. Since not occurring on quantifiers and some adverbials is generated only sentence initially, and

not occurring in the Aux is generated only in the Aux, transformations moving NP's and adverbials will potentially affect scope relations. For example, 57 and 58 will have the same deep structure.

57 The students didn't sol- many of the problems

58 Many of the problems weren't solved by the students

But as I noted earlier, in 58 many will be non-negated, while in 57 many can be negated. In fact, the 'unmarked' reading for 57 is synonymous with 59, in which many is overtly negated.

59 Not many of the problems were solved by the students

The same phenomenon is evident in the behavior of adverbials. 60, 61, and 62 will all have the same deep structure.

60 Often, I don't attend class

61 I don't often attend class

62 I don't attend class often

Those three sentences all have different scope characteristics. In 60 often is necessarily non-negated; in 61 it

is necessarily negated; and in 62, often can be negated or non-negated depending on intonation. In this case, as well as in the previous one, if scope is determined in underlying structure, movement transformations would have to be constrained in several ways. In addition, if the Pre-S syntactic proposal is accepted it is not clear that there could be a deep structure algorithm for determining not's scope.

The preceding two examples both involved not generated in the auxiliary. It will be recalled that in the syntactic analysis developed in Chapter I, not occurs in the Aux in surface structure if and only if it is there in deep structure. The same situation arises when not is generated sentence initially, in the Pre-S (which I argued may actually be the complementizer). Consider the following sentences.

63 Not many students solved all of the problems

64 Not all of the problems were solved by many students

63 and 64 will be derived from deep structures with identical relations between not and the two quantifiers. In both deep structures not will be present in the Pre-S and nowhere else. And presumably many students will be in subject position in both. But 63 and 64 have different truth conditions. Suppose there are twenty students and twenty problems involved, and that two students solved all twenty problems

while the other eighteen students each solved nineteen problems. Under these circumstances, sentence 63 is true regardless of which problems each student solved. But 64 will be false if, for example, for each of the eighteen students who failed to solve some problem, that student were the only one who failed to solve that problem. In that case, each problem will have been solved by at least nineteen students, a percentage that qualifies as 'many'.

These examples suggest that, minimally, the rule assigning the scope of not cannot apply until the transformations repositioning NP's and adverbials have applied on each cycle. An ordering consistent with this fact might include post-cyclic application of the interpretive rule, as was suggested in Jackendoff (1969) and Lasnik (1970). Certain meta-theoretical considerations, however, indicate that such an ordering might be inappropriate. The first relevant consideration is the notion of the 'strict cycle' discussed by Chomsky (forthcoming) and Kean (1972). Briefly, strict cyclicity requires 1) that no cyclic transformation apply so as to involve only material entirely within a previously cycled domain; and 2) that a transformation only involving material in an embedded cyclic domain be cyclic. Requirement 2 is simply a way of saying that whether or not a rule is cyclic should depend solely on its domain of operation. It excludes the possibility of calling passive, for example, a post-cyclic transformation, thereby allowing it to escape from requirement 1 by a notational trick. This convention,

if extended to interpretive rules, would require that a rule assigning not a scope be S cyclic, since in the examples I have discussed scope relations would be the same even if the sentences were deeply embedded. For example, the scope of not is unchanged when sentence 59 is embedded as in 59'.

59 Not many of the problems were solved by the students

59' John observed that Mary claimed that Bill realized that not many of the problems were solved by the students

The second argument for cyclic ordering involves simplicity of stating the semantic rule. In 15 above I summarized some of the generalizations relating syntactic distribution and scope of not. One generalization was that a quantifier can be within not's scope only if it is commanded by not. If S cyclic ordering is adopted, the command condition becomes superfluous and can be dispensed with. If not is assigned a scope on the first sentence cycle including it, there is no way that a quantifier not commanded by not can be negated by it. Both arguments for cyclic ordering of the interpretive rule are basically meta-theoretical, and, in fact, I know of no data that distinguish between cyclic and post-cyclic ordering of the rule on empirical grounds.

At the beginning of this chapter, I suggested some

aspects of the meaning of an NP with a negated quantifier in its determiner. Here I will explore the operation of the rule producing such readings, and in particular, the information that the rule refers to. I have already given examples indicating that derived linear order is relevant. In the analysis under discussion, 60 and 61 (which I reproduce immediately below) differ only by selection of the particular location to which the adverb *often* is moved. Yet the two sentences clearly differ in meaning.

60 Often, I don't attend class

61 I don't often attend class

Particularly significant about 61 is the fact that there is no way to induce a scope ambiguity. The sequence *n't often* behaves exactly like sentence initial *not often* or *not many* in this respect. To account for this fact, the scope rule must include some statement equivalent to 65.

65 Quant $\longrightarrow$ [+negated]/not__

Here I am using *Quant* as a cover term for quantifiers, quantificational adverbs of frequency, and motivational adverbials such as *because-* and *in order to-* clauses. The observations at the beginning of this chapter suggest that the following redundancy rule is required, as well.

66 [+negated] ⟶ [-referential]

In 65 and 66, and in the remainder of this chapter, I will be using phonological feature notation in a rather special way, quite similar to the usage in Jackendoff (1971). In particular, the 'rules' I introduce will not be used to change features. Rather, they will be used 1) as filters to mark as ungrammatical a sentence in which a rule must assign a feature in contradiction to an inherent feature of some item in the sentence; and 2) to add information where a feature is not inherently specified. In the immediately following discussion, both uses will be illustrated.

Rule 66, which I will return to below, will be relevant in the case of quantifiers and frequency adverbials but not, apparently, in the case of motivational adverbials. If such determiners as <u>some</u>, <u>several</u>, <u>a number of</u>, which I will call [+some] quantifiers, are regarded as markers of reference, that is if they are inherently referential, the ungrammaticality of example 10 can be explained.

10 *Not$\left\{\begin{matrix}\text{several}\\\text{some}\end{matrix}\right\}$of the problems were solved

Rule 65 will make the quantifiers in 10 [+negated]; by 66, they will therefore be specified as non-referential. Since the redundancy rule gives them a feature inconsistent with one of their inherent features, a contradiction results.

10's ungrammaticality, then, will be an instance of semantic anomaly. Here, and in the remainder of this chapter, I am using 'referential' to mean capable of having a referent in some possible world. Thus, in my terminology, several unicorns is necessarily [+referential], even though the phrase is lacking in a real world referent.

When not is in the Aux and the Quant (i.e., negatable item) is to the right of the Aux, the scope possibilities are rather more complex than in cases subsumed by rule 65. Earlier, I commented on the difference between the two readings of sentence 18.

18 I don't attend class often

With comma intonation, often in 18 is understood as non-negated; otherwise it is understood as negated. These two readings are synonymous, respectively, with 67 and 68.

67 Often, I don't attend class

68 I don't often attend class

Sentence 4 was a similar example.

4 I couldn't solve many of the problems

Again, depending on intonation, the quantifier can be either inside or outside the scope of not. When many is within the

same intonational phrase as not, it will necessarily be negated. When 4 is given an abnormal intonation in which I couldn't solve has the contour of an independent sentence, many will be non-negated. The two possibilities are informally illustrated below.

4a I couldn't solve many of the problems =
I was able to solve few of the problems

4b I couldn't solve many of the problems =
Many of the problems, I was unable to solve
cf. I couldn't sleep

4b shows that the 'intonational phrase' is to a significant extent independent of constituent structure, since solve and many are dominated by the same syntactic phrase node, VP. The independence is not absolute, however, since the contour of 4b is felt as unusual.

Motivational adverbial clauses pattern in a similar, though not identical, fashion. Sentence 24, repeated here, is a case in point.

24 Senator Eastland doesn't grow cotton to make money

With comma intonation, where the adverbial is separated from the intonational phrase including not, the adverbial is non-

negated. 24a illustrates this situation.

24a Senator Eastland doesn't grow cotton, to make money = The purpose of his not growing cotton is making money

Where the main intonational phrase includes the adverbial, the latter will be negated. To this extent, 24 is parallel to 4 and 18, and it will fall under the same generalizations. The difference between them is that 24 does not have the usual sentence contour even when the adverbial is negated: there will be one intonational phrase, but it will have a constantly rising contour, lacking the characteristic sentence final drop. Since that difference is not directly relevant to the facts under discussion, I do not intend to discuss it here, although it deserves further investigation. The single intonational phrase version of 24 is illustrated in 24b.

24b Senator Eastland doesn't grow cottom to make money = His purpose in growing cotton is something other than making money

These facts indicate that the intonational contour of a sentence is relevant to the determination of the scope of not, consequently, that the semantic rule follows the rules assigning stress and intonation contour. Superficially,

this conclusion seems at odds with the arguments presented above that the scope rule is cyclic, since the prosodic rules are generally assumed to follow the last cycle of syntactic rules. However, Bresnan (1971) persuasively argues that sentence stress is assigned by a cyclic rule which follows the syntactic rules on each syntactic cycle. Bresnan's analysis indicates that the semantic rule can be cyclic and still refer to the phonetic information I have shown to be relevant, assuming that the intonational rules can be ordered to apply with the stress rules. On each cycle, then, the rules will apply in the order given in 69.

69 1 syntactic transformations
2 stress and intonation contour rules
3. not scope rules

In its effect, the abnormal intonation contour under discussion is similar to the syntactic rule of topicalization. In both cases, an item is separated from the remainder of the sentence by a 'marked' construction. I suggest that the intonational rules can optionally generate the contours of 4b and 24a, but that at the output the optionality is not completely free. By that, I mean that the marked construction can be generated but that if it ultimately serves no function, the sentence will be abnormal. It seems to me that the primary function of the marked intonation is similar to that of topicalization -- it signals

that the remainder of the sentence is about the particular item separated.

The scope rule for not will consist of two sub-rules. The first of these concerns not contiguous to Quant: this rule was given in 65 above, and I repeat it here. The second, 70 below, concerns not separated from Quant, as in the cases just discussed.

65 Quant ⟶ [+negated]/not___

70 Quant ⟶ [+negated]/not X ___

where ⌒ indicates that not and Quant are in the same intonational phrase.

As they are presented here, 65 and 70 could be collapsed into one rule. In fact, 70 includes 65 as a sub-case, since there is no possible intonational phrase including not while excluding an immediately contiguous item. However, consideration of a wider range of cases shows that 65 and 70 are distinct in terms of possible inputs. 65 could reasonably be extended so as to include not just Quants but all NP's as well. The examples in 71 can all be explained if that is the case.

71a Not many people showed up (non-referential)

b *Not several people showed up

c *Not John showed up

By redundancy rule 66, a negated item is necessarily non-referential. Above, I argued that such a mechanism would account for the ungrammaticality of 71b, if several is regarded as inherently potentially referential. Similarly, if 65 is extended to all NP's, 71c will be explained since John is necessarily referential. In 71b and c the operation of the semantic rule results in semantic anomaly because of the contradiction produced.

Rule 70 cannot be extended to all NP's: 72 is grammatical even though not and John are included in the same intonational phrase.

72 I didn't see John

Further, even as it was stated Rule 70 is too strong since it would incorrectly predict that 73 is ungrammatical when it has a normal intonation contour.

73 I didn't solve $\left\{\begin{matrix}\text{some}\\\text{several}\end{matrix}\right\}$ of the problems

I conclude that 70 should be restricted so that it only applied to Quant's, and only to Quant's that are not of the class I have labelled [+some]. 65, on the other hand, should be extended to include all NP's and adverbials, even those that are not Quant's and do not have Quant's in their determiners. In 74, revisions of the two rules are given: 74a is 70 revised, and 74b is 65 revised.

74 Not Scope Rule

a $\begin{bmatrix}\text{Quant}\\ \text{-some}\end{bmatrix} \longrightarrow$ [+negated] / not X ___

b $\left\{\begin{matrix}\text{Adverbial}\\ \text{NP}\end{matrix}\right\} \longrightarrow$ [+negated] / not ___

As represented here, the not scope rule is basically a feature changing rule. If, as argued by Ross (1967), feature changing rules are subject to island constraints, the non-ambiguity of sentence 30 discussed above is easily explained. Rule 74a will be unable to penetrate the possessivized NP.

30 I couldn't understand Euclid's proofs of many of the theorems

When not is present in the Aux but 74 is inapplicable, either because of the pause intonation discussed, or the absence of a Quant, or the presence of an island boundary between not and the Quant, the negation apparently associates with the verb. Consider the two readings of 75.

75 I didn't accept many of John's results

When 75 has normal intonation, rule 74a applies and 75 is synonymous with 75'.

75' I accepted few of John's results

When the marked intonation contour isolates many from not, accept is negated and the reading produced is roughly synonymous with 75".

75" I rejected many of John's results

Similarly, the absence of a quantifier will force the association of not and the verb, as in sentence 76.

76 I didn't accept the proposal. = I rejected it.

For an interesting and useful discussion of the negation of predicates, the reader is referred to Kiparsky (1970). Kiparsky discusses the kind of polar negation evidenced in the above examples by means of which not like and not good are equivalent to dislike and bad respectively, for example. Kiparsky observes that,

> "I don't like it" normally means "I dislike it", and the logically available meaning "I'm indifferent to it" is not intended although as usual it can be forced out by explicitly excluding the normal meaning, as in "I didn't particularly like it or dislike it.

In the course of his discussion, Kiparsky suggests that the near synonymies usually accounted for by Not Hopping (or Negative Transportation or Neg Raising), a transformation first proposed by Fillmore (1963), are actually instances of this same sort of polar interpretation of negation. Kiparsky

considers the following pair of sentences.

77 I don't believe he's here

77' I believe he's not here

He states that,

> ...since the gradable predicates like believe are subject to the rule that their negation is understood as polar opposition, "I don't believe he's here" comes to mean "I disbelieve he's here" (just as "I'm not happy" comes to mean "I'm unhappy"). And now a fact about the logic of belief enters the picture. "I disbelieve he's here" means logically (by projection rules) the same as "I believe he's not here" (whereas, for example, "I'm unhappy he's here" and "I'm happy he's not here" are two quite different propositions). What seemed due to a special and restricted transformational rule is, therefore, in reality the interaction of two general semantic principles: a semantic extension rule applicable to graded antonyms, and a rule of logical equivalence applicable to words denoting belief.

Kiparsky's suggestions indicate a very promising line of investigation, and they are supported by other facts about the relevant verbs. Consider, for example, the following question.

77" Do you think John is here?

Generally, the object of such a question will not be to find out whether the askee has thoughts about the matter, but

rather to find out whether John is here. That is, the question is about the complement, just as the negation, in the earlier examples, is on the complement. But in example 77", it is not obvious how a transformation could predict these facts; on the other hand, a semantic principle very like the one suggested by Kiparsky could be operative in this case, as well. A similar situation arises in the case of sentences like 78.

78 I don't believe in God

Sentence 78 does not indicate that the speaker has no opinion about God's existence, but rather that he believes that God doesn't exist. Thus, the interpretation of the sentence is parallel to that of 77 above. But in this case, there is no underlying source in the complement of believe for the negation, and hence, the interpretation is apparently produced by some semantic principle like that under discussion. Consequently, some version of the principle Kiparsky proposes must be available to the grammar, and therefore it is also available for the interpretation of 77, making Not Hopping unnecessary in that case.

3 Syntactic and Semantic Rules and their Ordering in the Pre-S Theory

In Chapter I, I argued that the syntactic differences

between not long ago and not often can be easily described in terms of the Pre-S analysis. If the former is generated 'whole' and the latter is the product of Not Adjustment (the transformation incorporating a pre-S not into the first constituent to its right), the fact that the two phrases behave oppositely with respect to possible non-initial occurrence and Subject-Aux Inversion will follow from rule ordering. Not Adjustment will follow the movement transformations on each cycle, and SAI will require a pre-S not in its environment. Semantically, the two types are also distinct. Earlier in this chapter, I gave evidence that not often like not many is necessarily non-referential. Formally, that generalization is captured by redundancy rule 66. Phrases like not long ago, on the other hand, do not have a denial of reference; in example 56 above the phrase is consistent with a specific time reference.

56 (Not long ago)$_i$ I attended class. I attended on Monday$_i$.

If not long ago is a constituent in deep structure, as at subsequent stages of the derivation, it can be interpreted in the deep structure by a projection rule different from rule 74, which operates cyclically. This projection rule plus the dictionary entries for the words involved will construct the reading 'a short time ago' or 'recently' for the phrase. Rule 74 will then be constrained so as not to

apply to a phrase that has already been given a reading amalgamating not. Hence the Pre-S analysis provides a principled way of distinguishing the two adverbial classes both syntactically (as I showed in Chapter I) and semantically. Since the Determiner Theory provides no such mechanism, it is clearly inferior to the Pre-S Theory in regard to sentences like 56.

In addition to the semantic rules for negation I have already discussed, the grammar will require a rule like that described by Jackendoff (forthcoming) as attraction to focus. Attraction to focus (AtF) is responsible for the interpretation of the negation in example 79.

79 I didn't see John. I saw Bill.

AtF 'zeroes in' on an item with extra heavy stress, and semantically erases it. That is, the stressed item is labelled incorrect, and its slot is designated to be correctly refilled. The most striking aspect of the operation of AtF is that anything in the sentence can be focussed and denied. This is in sharp contrast to rule 74a which has a restricted number of possible inputs. The examples in 80 illustrate the operation of AtF with respect to various lexical classes.

80 a I didn't write a long thesis. It is short.
b John didn't get the result, but he got a result

c Bill didn't play a very good game. It was just a fairly good game. cf. Bill didn't play a very good game = In fact, he played a pretty bad one.

d I didn't describe the data. I explained it.

Note that even 'positive polarity items' in the sense of Baker (1970) can be negated by AtF, as in 81.

81 John isn't somewhat smarter than Bill. He's much smarter.

82 He didn't discuss a good deal of data. He discussed a great deal of data.

Another difference between rule 74 and AtF is that the former is restricted by island constraints, as I showed above, while the latter is not. Example 83 is parallel to 30 above, but in 83 the negation is oblivious to the island boundary.

83 I didn't understand Euclid's proofs of many of the theorems; I understood his proofs of only a few of them.

Co-ordinate structures are similarly penetrable by AtF:

84 I didn't talk to Chomsky and all of his colleagues; I talked to Chomsky and most of his colleagues.

A more fundamental difference between Rule 74 and AtF is that only the former constructs semantic entities by amalgamating not with another item. AtF only provides the information that the focused item is incorrect and will be replaced. As an example of this difference, contrast 85 with 86.

85 I didn't solve many of the problems

86 I didn't solve many of the problems...

By rule 74a, 85 is given a reading incorporating negation into many. Semantically, a new unit is created with a well-defined meaning: one of the aspects of this meaning is the non-reference already discussed; a second is the proportional relationship between not many (=few) and the set. The semantic unit created has entailments, for example, that all is false where not many is true. Thus, when 85 is true 87 is false.

87 I solved all of the problems

The negation in 86, on the other hand, is not of this type. When a focus is negated, no entailments result, as shown by 88.

88 I didn't solve many of the problems. I solved all of them.

The negation involved in the 'gapped' sentences discussed in Chapter I seems to be closely related to attraction to focus. 89a and b, for example, receive the same interpretation.

89 a I didn't see John. I saw Bill.
b I saw Bill, not John.

In 89a, Bill is the focus by virtue of its heavy stress; in 89b, it is focus since nothing else is present. Both processes can negate more than one item simultaneously, as in 90.

90 a John didn't see Bill; Mary saw Susan.
b Mary saw Susan, not John, Bill.

In addition, gapped sentences parallel to 86 above also produce no entailments.

86' I solved all of the problems, not many of them.

Attraction to focus is applicable, then, in two types of situations: 1) sentences where some particular item or items have heavy stress as in 89a and 90a; 2) gapped sentences such as 89b and 90b. Interestingly, there do not seem to be sentences analogous to 89a in which not is somewhere other than in the Aux. 91 is bad in isolation, and is

also bad when contrasted in 92.

91 *Not John came

92 *Not John came. Bill came.

92 is only acceptable, it seems to me, when a recitation is being taught by rote, and that sentence is used to correct someone who failed to remember a passage precisely. 92 cannot be used in the way 89a can -- to convey information with the purpose of changing someone's beliefs.

The impossibility of AtF in 91 and 92 is consistent with a rule formulation suggested in Chapter I. There I argued that Not Adjustment, the rule incorporating a pre-sentential not into the first constituent to its right, is obligatory but that its structural description is only met when a verb is present in the sentence. With this formulation of the rule, not in 91 and 92 will necessarily be incorporated into the subject NP. In gapped sentences, however, incorporation will not take place since the verb is absent. Consequently, Rule 74b can be made sensitive to the two possible initial positions for not. In particular, Not Adjustment can precede 74 and the semantic rule can be prevented from applying when not is in the Pre-S. Not Adjustment will obligatorily apply to 91, "Not John came". The structural description for 74b will then be met, and the operation of the semantic rule will result in 91 being marked semantically anomalous, since John will be marked 'negated' and

therefore 'non-referential'. This proposal correctly predicts that sentence 93 is unambiguous, if 74b is ordered before AtF.

93 Not many of the problems were solved

NA will obligatorily apply producing a suitable input for 74b; consequently not many will be interpreted as few, and will have the corresponding entailments. Hence, 93 will never have an Attraction to Focus reading and 94 will be impossible.

94 *Not many of the problems were solved; they all were.

As I stated earlier, non-reference is not the only attribute of a negated phrase. An additional factor is the proportional relationship between, e.g., not many and the entire set. Hence, the phrase must contain the properties of a quantifier. As a result, even when an NP is without reference in all possible worlds, square circles, for example, not is still incompatible with the NP if it cannot be quantified: *not square circles.

It will be necessary to prevent Not Adjustment from applying to such sentences as 95.

95 John came, not Bill

If NA were to apply, rule 74 would also apply and 95 would be marked anomalous. I have suggested that the crucial difference between 95, 89b, and 90b, on the one hand; and the ungrammatical 91, on the other hand, is that in the latter the verb of the sentence is present. The correct grammaticality attributions can thus be predicted if Not Adjustment only applies when a verb is present. One rather significant consequence of this framework is that Gapping apparently cannot be a syntactic transformation. I have indicated that rule 74 might be cyclic; if this is correct, the semantic rule must have access to the output of NA, the latter must also be cyclic. If, as I have suggested, NA must 'know' whether a verb is present, gapped sentences must apparently be generated in the base, since a gapping transformation would not apply until the cycle including both conjuncts of 95. That is, Gapping would not apply until NA and 74 had applied on a prior cycle marking sentence 95 anomalous. I conclude that sentence 95 is generated verbless (i.e. with a dummy verb node) and is interpreted by an interpretive Gapping rule, analogous to the interpretive anaphora rules discussed by Wasow (1972).

4 Scope, Reference, and Specifity

In the preceding section, one problem I dealt with was the non-occurrence of <u>some</u> immediately to the right of <u>not</u>. I argued that this followed from a semantic redundancy rule

which attributes non-reference to a negated item. I did not deal there with the distribution of any, which is clearly a related problem. On first examination, it seems reasonable to regard any as having relevant semantic properties the opposite of those of some. If the ungrammaticality of not some follows from the inherent potential referentiality of some, perhaps the ungrammaticality of example 96 stems from a semantic feature of non-reference lexically attributed to any.

96 *Anyone showed up

That such a proposal is incorrect is illustrated by sentence 97.

97 If anyone$_i$ shows up, bring him$_i$ in

Here anyone has the property I called 'referentiality' earlier, that is, it is referential in some possible world. Hence, one could not explain the occurrence of any in negative sentences and into non-occurrence in 96 by a converse rule to 74 above, i.e., by a rule that would attribute referentiality to a Quant 'elsewhere'.

In this section I will suggest that it is specificity rather than referentiality that is relevant to a description of the distribution of any. By rule 74, when an element is in association with not it is marked non-referential. I

propose that when 74 is inapplicable, NP's are marked as [+referential]. Various modal contexts will make [+referential] Quants [-specific]. One such context is a conditional sentence like 97. In that sentence, <u>any</u> can be replaced by <u>some</u> as in 97a.

97a If someone$_i$ shows up, bring him$_i$ in

In a conditional context, however, <u>some</u> cannot be interpreted as specific:

97b *If someone$_i$ shows up bring him$_i$ in; his$_i$ name is John

Another construction inducing non-specificity is the question. 98 is grammatical with either <u>some</u> or <u>any</u>, but either can only be non-specific, as demonstrated by the parenthesized continuation.

98 Did $\left\{\begin{matrix}\text{someone}\\\text{anyone}\end{matrix}\right\}_i$ come in? (*His$_i$ name is Harry.)

Certain other modal contexts permit both specifity and non-specificity, for example, the <u>want</u> context discussed by Jackendoff (1971).

99 I want to catch some fish; $\left\{\begin{matrix}\text{but I don't know if there are any.}\\\text{they are over there.}\end{matrix}\right\}$

Finally, there are constructions that require specificity. One such construction is the past tense sentence as in 100.

100 Someone arrived yesterday

Though I will not be able here to give the above contexts the attention they deserve, I would like to put forward the hypothesis that <u>any</u> generally only occurs in an environment conditioning non-specificity. I have presented four distinct environments thus far. The first, negation, has been discussed at some length: I proposed that a negated item is redundantly non-referential. I suggest that as a formal extension of this theory, non-referentiality be redundantly classified non-specificity. The cases I discussed immediately above were all examples of potential referentiality, represented by [+referential], which apparently has the sub-classes 1) non-specific; 2) specific. If a Quant has not been marked non-referential by rules 74 and 66, it will then be subject to a set of rules which I informally summarize as 101.

101 a Quant → -specific / certain modal contexts, including conditionals and questions

b Quant → +specific / elsewhere

If, as I suggested in Iasnik (1970), <u>any</u> is lexically non-specific, it will be grammatical in association with <u>not</u> and in environments governed by 101a; it will be ungrammatical

elsewhere since 101 will mark it specific, a marking incompatible with its inherent marking of [-specific]. The want context illustrated in 99 above appears to be an exception to the schema in 101, since one would expect that any could occur in the object of want when the latter is to be interpreted non-specifically. However, any cannot occur, as demonstrated by 99'.

99' *I want to catch any fish

In the following section, I will suggest that the ungrammaticality of 99 is related to another phenomen, independent of the specific/non-specific distinction.

5 A Speculation on the Meaning and Function of Any

Jackendoff (1971), in discussing some observations made by Vendler (1967), argues that any cannot be a form of the universal quantifier. Before considering Jackendoff's argument, I will present a number of examples consistent with the position he opposes. First, consider the difference in meaning between the following two sentences.

102 I didn't solve all of the problems

103 I didn't solve any of the problems

As observed by Quine (1960), either sentence can be quite

plausibly paraphrased using the universal quantifier, with the only difference being the relative order of negation and the quantifier. 102 and 103 are informally paraphrased by 102' and 103' respectively.

102' Not for all X (X is a problem $\rightarrow$ I solved X)

103' For all X (X is a problem $\rightarrow$ I didn't solve X)

In Quine's terms, <u>all</u> is the universal quantifier with narrow scope and <u>any</u> is the universal quantifier with wide scope. Conditional sentences can be described in similar terms.

104 If everyone passes the test, I'm quitting

104' If (for all x, x passes the test) I'm quitting

105 If anyone passes the test, I'm quitting

105' For all x (if x passes the test, I'm quitting)

A third pair, less strikingly divergent in meaning, are 106 and 107 below.

106 Everyone might be elected

107 Anyone might be elected

The primary interpretation of 106 is that there is a chance that everyone will be elected, i.e., there are so many positions open that there might be a position for everyone running. The only interpretation for 107, on the other hand, is that

every individual has some chance to be elected, even though there could conceivably be many more candidates than positions.

Jackendoff discusses the sentences in 108. (Jackendoff's ex. 44, paraphrased from Vendler)

108 I have here some apples: you may take

{every one / all / any one / any} of them.

Jackendoff claims that, "Here [in 108,HL] any clearly is not synonymous with the universal quantifiers." Since Jackendoff neither paraphrases the sentences of 108 nor provides a definition of the universal quantifier, I am not clear about exactly what he has in mind. Certainly, the four sentences are not synonymous, but neither are the pairs of sentences I discussed immediately above. Yet I showed that in those sentences, any can be plausibly described as the universal quantifier. The same analysis I used in those cases can be extended to handle most of the facts in 108. First, compare an offer to take all of the apples, with one to take any of them. In the former case, Vendler observes,

> If you started to pick them one by one, I should be surprised. My offer was sweeping: you should take the apples, if possible, "en bloc."

Further, to extend Vendler's suggestion, it seems to me that an offer to take all can generally be construed as allowing the hearer to take all or none, but not some intermediate

number. Such an offer can be analyzed as having the universal quantifier within the permission modal:

109 You have permission (for all x, you take x)

"You may take any" is much freer; it allows a choice in every individual case. That is, the hearer may elect to take anything from zero apples up to all the apples. In this case, any can be analyzed as the universal quantifier with wide scope:

110 For all x (you have permission to take [or not take] x)

The other two cases in 108 are more complex. Superficially, any one and every one are parallel, but a closer examination reveals basic differences between them. In the former case, one is a numeral, and other numerals can be substituted for it: any two, any three, etc. In every one, one appears to be not a numeral but a pronoun: the substitution of numerals is impossible -- *every three of them. If this is correct, then every one will be expected to behave like every or all in 108, in its scope relations. Since the sentence with every one can reasonably be paraphrased by 109, the prediction is borne out. Assuming that one is a numeral in any one, 108 with that phrase can be represented as 111.

111 For all x (you have permission you take x)

condition: $\forall x \forall y$ (you take x$\wedge$you take y $\rightarrow$ x=y)

111 like 110 gives permission to choose from the entire set of apples, but the numeral (represented in the condition) requires that only one apple can be taken. A similar representation could be given for <u>any two</u>, in which only the condition would differ. Thus, there are indeed differences between <u>any</u> and <u>every</u>, for example, but in the cases Jackendoff discusses, as in the cases I considered earlier, the basic difference is a scope difference. It can still be maintained, then, that <u>any</u> is a form of the universal quantifier.

Probably the most interesting problem about <u>any</u>, and unfortunately, one that I have no developed theory for, is why it exists, that is, why an alternate form of the universal quantifier is needed. I suspect that its primary function is the resolution of potential scope ambiguities. In all of the examples in the preceding section, I showed that plausible representations for each pair would make both <u>any</u> and <u>every</u> universal quantifiers: <u>any</u> the one with wide scope, and <u>every</u> the one with narrow scope. If <u>every</u> (and presumably <u>all</u>) is regarded as the unmarked form of the universal quantifier, then it will be possible in all contexts, as seems to be the case. Consider now the case of sentences involving negation, such as 102 above, which I repeat here.

102 I didn't solve all of the problems

In 102, all is commanded and preceded by not; it is also negated, the unmarked situation for its context. Any in 103 is analyzable as the universal quantifier outside the scope of the negation.

103 I didn't solve any of the problems

But any occupies the same position as all did. Hence, its semantic form represents the marked condition. I suggest that in general, any is possible only in positions where all is both possible and logically within the scope of some operator. Thus, any, which is clearly the marked and more restricted form, will be possible only when its presence indicates the marked logical form. I showed that in 105, 107, and 108, plausible paraphrases can be given that conform to this generalization. Further, it is correctly predicted that any will be ungrammatical in such sentences as 112, in which no scope ambiguity could exist.

112 *I spoke with anyone yesterday

My hypothesis receives some support from the fact that not all modals condition the occurrence of any. Must and should, for example, are incompatible with it.

113 *You must solve any of the problems

114 *You should solve any of the problems

But as far as I can tell, no meaning difference depends on whether $\forall$ is analyzed as inside or outside of those modals.

114 You must solve all of those problems

114' For all x (you must solve x)

114" You must (for all x, you solve x)

Note that the environments falling under this generalization seem to be just those environments for which reference to specificity alone, i.e., by rule 101, makes incorrect predictions. Must and should, for example, both allow a non-specific reading of some, as in 115.

115 I must talk to someone, but I don't know who

Hence 101, without the extension just suggested, would incorrectly predict that any is compatible with must and should. Similarly, as I mentioned earlier, want permits a non-specific reading for some, but excludes any. This may fall under the same generalization, since 116 and 116' seem to be equivalent.

116 For all x (I want to solve x)

116' I want (for all x, I solve x)

Obviously, I have left much unexplained in this description of the behavior of any. In particular, it is not clear

what formal mechanisms can be used to capture the generalization. However, the proposals I have made seem to be a reasonable point of departure for further investigation, and whether or not they turn out to be correct, the generalizations behind them will have to be taken into account by any theory of scope.

6 Concluding Observations

In effect, three different proposals for dealing with the scope of negation have been discussed in this chapter. The analysis which I have called the Determiner Theory provides for interpretation of negation in the deep structure. The Pre-S Theory, on the other hand, subsumes two derived structure interpretive analyses differing only in ordering. In one, interpretation takes place at one late derived level; in the alternative, interpretation takes place at the end of each syntactic cycle. I presented two theoretical arguments for choosing the cyclic over the post-cyclic interpretive analysis, and I pointed out that there is no clear data deciding between the two orderings. That result is not particularly surprising, since the principle of the strict cycle, which I have accepted, drastically limits the extent to which structures can be altered after the cyclic transformations have applied. That is, post-cyclic interpretation will be empirically very close to cyclic interpretation, since post-cyclic structure will necessarily be very similar

to structure at the end of each cycle.

Even more interesting than the empirical similarity between the two derived structure analyses is the similarity between both of them and the deep structure proposal. With respect to the core data, principally sentences with a quantifier or adverbial and having not in the Aux or in the sentence initial constituent, the relevant facts could be described by either the Pre-S analysis or the Determiner analysis. It is only with respect to a particular class of adverbials, those patterning like not long ago, that the Pre-S analysis has clear advantages. But even in that case, perhaps a revised deep structure analysis could be proposed. Again, it is not surprising that the extent of empirical difference between the two analyses should be slight, since I have assumed the correctness of Emond's structure preserving hypothesis, which guarantees a close correspondence between deep and surface structures.

One might ask, then, whether it is possible in principle to decide whether scope of negation must take derived structure into consideration. In a wider perspective, it appears that derived structure interpretation (e.g., the Pre-S analysis) must be preferred. Although the interpretation of not could conceivably be handled in deep structure by some modification of the transformational mechanism discussed early in Chapter I, I know of no way that scope of quantifiers could be so handled. As Lakoff (1969) and others have discussed, derived structure order of quantifiers is relevant

to scope interpretation. For example, the two transformationaly related sentences, "Everybody solved most of the problems" and "Most of the problems were solved by everybody" at very least differ in order of preference of interpretation of scope. The preferred reading (perhaps the only reading) for the first sentence is that every individual solved problems totalling more than half of the problems. The primary reading for the second sentence, on the other hand, is that there was a set of problems, totalling more than half, such that each of those problems was solved by everybody. Suppose that there were three people and eleven problems involved. If John solved problems 1 through 6, Bill solved 6 through 11, and Mary solved 1, 3, 5, 7, 9, and 11, then no problem was solved by everybody, and it is false that "Most of the problems were solved by everybody" but true that "Everybody solved most of the problems". But in the case of quantifiers, there would appear to be no transformational analogue to Not Shift that could guarantee correct correspondence between derived structure order and deep structure order. Since order is relevant to scope interpretation, quantifier scope must be regarded as a derived structure phenomenon. Thus, if a unified theory of scope is to be constructed, the interpretation of the scope of not must also be accomplished in derived structure, and something like my Pre-S analysis must be preferred over deep structure interpretation.

CHAPTER III

PREVIOUS ANALYSES

Since Klima's paper (1964), there have been two widely discussed proposals for negative sentences. The earlier of the two was first suggested by Lakoff (1965) and developed by Lakoff and Carden in a number of papers. They argued that quantifiers are higher predicates in deep structure and that scope relationships reflect underlying command relationships. This higher predicate analysis was soon expanded to encompass not and other logical elements as well. Finally, the analysis was augmented by a system of Derivational Constraints, devices that would guarantee the correct correspondence between underlying command relationships and derived precede relationships.

Jackendoff (1969) proposed an alternative analysis in which underlying structures are quite similar to surface structures. Quantifiers, for example, are generated in determiner position. Scope relations in Jackendoff's analysis are determined on the basis of surface structure tree configuration, in particular, on the basis of surface precede and dominance relationships.

In this chapter, I will examine the proposal of Lakoff and Carden (henceforth to be called the Derivational Constraints Analysis or DCA) and that of Jackendoff (henceforth to be called the Surface Interpretive Analysis or SIA). It should be understood that DCA and SIA refer to the specific proposals

of I & C and J, respectively, rather than to any other conceivable analysis using the notions derivational constraint or surface structure interpretive rule. I will be principally concerned with the determination of meaning within the two analyses since neither has placed great emphasis on such syntactic considerations as the form of the transformations involving not or the derived constituent structure of the sentences affected. However, I will not ignore the syntactic implications of DCA and SIA.

1 Lakoff and Carden

To my knowledge, the first developed proposal that scope ambiguities be handled by extending the notion predicate appears in Lakoff (1965). Lakoff considers various adverbial phrases and argues that their interaction with negation can only be explained if those adverbials are deep structure higher predicates. One of his examples is F-6-3 which has readings synonymous to F-6-4 and F-6-5 (L's numbering).

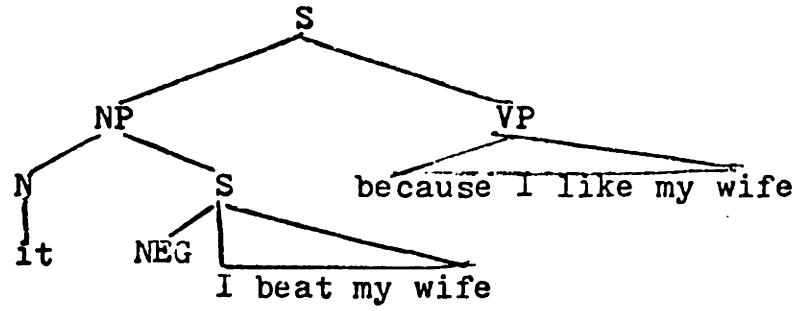
F-6-3 I don't beat my wife because I like her

F-6-4 It is because I like her that I don't beat my wife

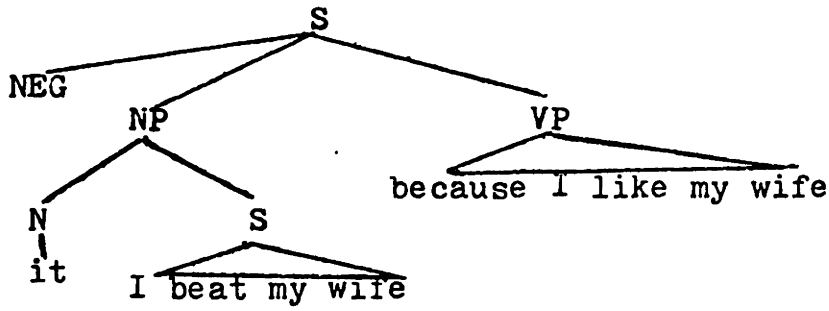
F-6-5 It is not because I like her that I beat my wife

Lakoff states that "The only way we could reasonably account for the ambiguity of F-6-3 would be to derive it from the abstract structures underlying F-6-4 and F-6-5."

F-6-4'



F-6-5'



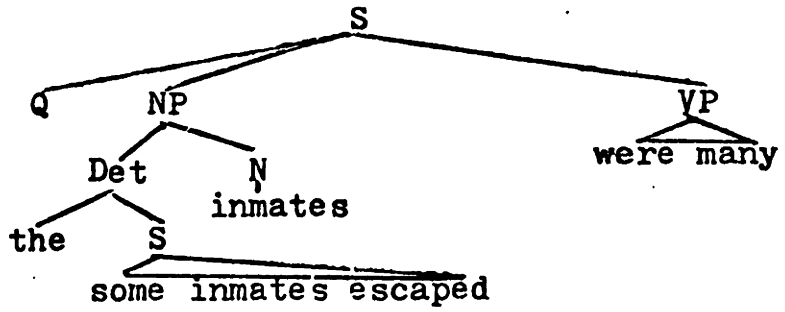
The scope ambiguity, then, reflects the difference between two deep structures, one with the negation on the "highest" sentence, and the other with the negation on an embedded sentence.

Lakoff proceeds to examine sentences with quantifiers, and he arrives at a conclusion similar to that presented for adverbs. He states that sentence F-9-22 assumes that some inmates escaped and asks whether that number was great. [Actually, he claims that the sentence is ambiguous, but he later (1970) agrees with Partee (1970) that the alternative reading is spurious. Below, I will discuss some of the implications of this non-ambiguity.]

F-9-22 Did many inmates escape?

To capture the fact that the question concerns many, Lakoff proposes that quantifiers be generated in predicate position, as in F-9-24.

F-9-24



Carden (1967) discusses a rule which he calls Q-magic and which Lakoff (1970) calls Quantifier Lowering, whose effect is to "lower" predicate quantifiers like that in F-9-24 onto their associated NP's. Lakoff also suggests that not is also a predicate.

The syntactic factors in the DCA analysis, then, are the following. Quantifiers, not, and many types of adverbs are generated in predicate position, and, as far as I can tell, only in predicate position. There is a rule of Quantifier Lowering repositioning quantifiers (and presumably not) into the sentences they are above in deep structure.

Lakoff (1969) extensively discusses the semantics of sentences with quantifiers and in particular examines the scope of logical elements. Of particular interest is a set of sentences discussed by Jackendoff (1969). Jackendoff observes that sentence 2, the apparent passive of sentence 1, has a meaning that 1 does not have.

1 Many arrows didn't hit the target

2 The target wasn't hit by many arrows

The primary reading of 2 is something like 2'. (Actually, Jackendoff claims that 2' is the only reading, but for most speakers, including Lakoff and myself, 2 is ambiguous. I will return to this fact below.)

2' There are few arrows such that the target was hit by them

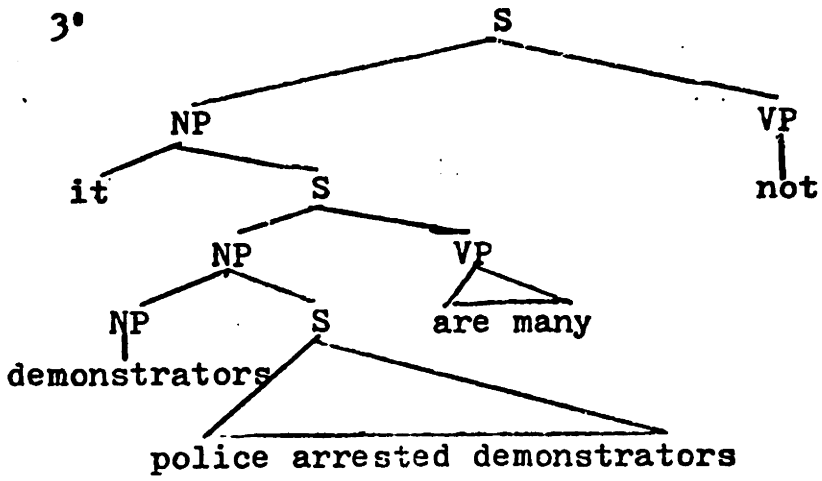
Sentence 1 cannot have a reading corresponding to 2'. But if the passive rule freely applies, as Jackendoff observed, wrong readings will be predicted in several cases, assuming that scope relations can be determined in deep structure. For example, in the following sentences of Jackendoff's it is the passive sentence that lacks a reading associating not with many.

3 The police didn't arrest many of the demonstrators

4 Many of the demonstrators weren't arrested by the police

To explain these and other related scope phenomena, Lakoff introduces the notion (Global) Derivational Constraint (DC).

Consider D.S..3', consistent with proposals in Lakoff (1969). (Irrelevant details are omitted.)



As Jackendoff points out, if the Passive transformation applies unconstrained, 3' could optionally produce 4. But 3' means "There are few demonstrators such that the police arrested them," while 4 cannot have such a reading. Similarly, a deep structure for 2' could optionally produce 1, if Passive does not apply. Again, 1 cannot have a reading corresponding to 2'. To prevent these faulty derivations, Lakoff proposes the following Derivational Constraint or well-formedness condition on derivations.

5 Let $C_1 = Q^1$ ccmmands Q^2

$C_2 = Q^2$ commands Q^1

$C_3 = Q^1$ precedes Q^2

Constraint 1: $P_1/C_1 \supset (P_n/C_2 \supset P_n/C_3)$

'/' means 'meets condition'

> Constraint 1 states that if two quantifiers Q^1 and Q^2 occur in underlying structure P_1, such that P_1 meets condition C_1, then if the corresponding surface structure P_n meets condition C_2, that surface structure must also meet condition C_3. In short if an underlying assymetric command-relationship breaks down in surface structure, a precede-relationship takes over.

Subsequently, Constraint 1 is expanded to include scope relations involving negation as well. The result is Constraint 1', given in 6 below.

6 Let C_1 = L^1 commands I^2 (L = Q or NEG)

C_2 = L^2 commands L^1

C_3 = L^1 precedes I^2

Constraint 1': $P_1/C_1 \supset (P_n/C_2 \supset P_n/C_3)$

Finally, after giving examples that suggest that it is not surface structure that is involved in these constraints but rather 'shallow structure,' Lakoff argues that the derivational constraint should not simply constrain deep structure and some one level of late derived structure, but rather should constrain every stage in the derivation between these two points.

> Since they [the constraints proposed by Lakoff] only mention underlying structures P_1 and surface structures P_n, they leave open the possibility that

> such constraints might be violated at some intermediate stage of the derivation. My guess is that this will never be the case, and if so, then it should be possible to place much stronger constraints on derivations than 1'... by requiring that all intermediate stages of a derivation P_i meet the constraint, not just the surface structure P_n.

Lakoff therefore replaces Constraint 1' with 1".

7 Constraint 1": $P_1/C_1 \supset (\forall i \ (P_i/C_2 \supset P_i/C_3))$

2 Commentary on the Derivational Constraints Analysis

It is apparent that the primary motivation for DCA lies in the semantic generalizations it is claimed to be able to capture. That is, for the DC's above to have any content, it is necessary that quantifiers, negation, various classes of adverbs, etc., be treated as predicates, as Lakoff and Carden have treated them. But there is very little <u>syntactic</u> evidence in English (the only language I and C have examined in this regard) for so treating them. Lakoff (1970), for example, presents sentences like 8 and claims that such sentences are archaic rather than ungrammatical.

8 The men were many

To my ear, such sentences seem entirely ungrammatical,

although not inconceivable. I would argue that the fact that they were once grammatical -- as appears to be the case -- is an irrelevant consideration in a description of present-day English. Lakoff suggests that the simplest diachronic description would require that at both stages, an underlying predicate position for quantifiers be postulated. The change into present-day English is then the quantifier lowering rule becoming obligatory. But if one regards the child's process of learning a language (of constructing a grammar of a language) as building the simplest theory to handle the input data of heard sentences, then it is reasonable to assume that if a rule of lowering ever existed, as soon as it became obligatory, a restructuring of the grammar occurred. That is, subsequent generations would have no motivation for reconstructing the earlier stage as an underlying structure.

One further syntactic consideration concerns other logical elements that DCA takes to be predicates. As Lakoff admits, large classes of relevant sentences do not sound just "archaic" but rather are resoundingly ungrammatical. Consider the following examples.

9 *The men were some

10 *The men were all

11 *The men were not

11' *That John is here is not

To explain the disparity between 8 and the set 9 - 11, Lakoff proposes that at some earlier stage in the language, Quantifier Lowering was optional for *many* and *few* but obligatory for *some* and *all*; (and presumably, although Lakoff never elaborates on this point, some other obligatory rule applies in the case of *not*). At no time, then, was there *syntactic* motivation for generating several of the relevant words as predicates.

I do not intend here to examine the stage in the history of English at which 8 was grammatical. It is of some interest, however, that 8', which is grammatical in my English, was a frequent variant of 8.

8' The men were many in number

There seems to be a generalization that the two quantifiers that were once grammatical in predicate position -- *few* and *many* -- could, and still can, occur with the phrase *in number*. Those that could never occur in predicate position -- *all* and *some*, for example -- are ungrammatical with that phrase.

9' *The men were some in number

10' *The men were all in number

I have argued that, at least in English, there is very little syntactic motivation for treating quantifiers and negation as predicates. Similarly, other that scope

phenomena, there has been no semantic evidence presented by Lakoff (1969; 1970; 1971) for this position, and in fact there is strong evidence against it. For example, Lakoff presents (semantic) deep structures in which many is predicated of men. But there is no obvious way in which manyness is a property attributed to men. In this case (and in the case of few), a modification of the deep structures would be necessary, in order to reflect the fact that the quantifier actually attributes a property to the size or cardinality of the set containing the subject noun phrase. Thus, 8 "The men were many" means something like 12.

12 The cardinality of the set of 'the men' is great (relative to some expectation)

In general, to the extent to which quantifiers can occur in predicate position at all, they have interpretations of that sort. A similar example is 13 which is roughly synonymous to 14.

13 The men who left were five in number

14 The cardinality of the set of the men who left is five

If 14 is the 'meaning' of 13, presumably the DCA would have to make 14 the deep structure for 13. Quantifier lowering would then not be sufficient to generate 15.

15 Five men left

Several additional transformations would be required as well to eliminate the excess structure.

This situation, and several others which I will discuss, provide a significant refutation to the often repeated claim that the underlying structures posited in Generative Semantics (the position of Lakoff, McCawley, Postal, Ross, and others) are close approximations of the 'logical form' of sentences. Ross (1970), for example, states that

> ... increases in the abstractness of syntactic representations decrease the distance between those representations and semantic representations...

But frequently, the sole motivation for the more abstract structure is a particular semantic consideration, such as scope in the case of negation and quantifiers. Above, I discussed cases where syntactic generalizations have been ignored by Lakoff in order that scope relations could be directly reflected in the base. But even more important than this disregard for syntactic generalizations is Lakoff's failure to consider the further semantic implications of the structures he proposes. For example, both <u>not</u> and <u>often</u> are treated as predicates taking sentences as arguments. Lakoff (1965) also generates locative adverbials in the same predicate position. But there is a clear semantic difference between <u>not</u>, <u>true</u>, <u>false</u>, etc., on the one hand, and

frequency or locative adverbials on the other hand. Semantically, the first set can reasonably be thought of as predicates on propositions. However, to the extent that frequency or locative adverbials can be thought of as predicates at all, they are predicates not on propositions but on events. Since Lakoff has proposed identical underlying configurations for the two classes, and in fact has implicitly used the claimed parallelism as further motivation for the structures, it is not true that his underlying structures reflect logical form.

In the cases discussed earlier, I will assume that it would be possible (if not easy) to write transformations that would generate 15 beginning with 14, the semantic structure I have suggested. In several other relevant cases, however, I have difficulty in seeing how quantifiers can be said to be predicates on either noun phrases or on the cardinality of the sets containing noun phrases. Consider sentence 16.

16 All the men left

Sentence 17 is ungrammatical, and even more significantly, 18 (analogous to 12 and 14 above) seems completely uninterpretable.

17 *The men who left were all

18 *The cardinality of the set of men who left is {all / entire / complete}

Hence at very least, adjectives, for example, and quantifiers behave in different ways semantically with respect to what they predicate, and in some instances it is not clear that quantifiers can be said to be predicates at all, either syntactically or semantically.

At this point, it would be in order for me to point out that McCawley (1972) has proposed a modification of the basic DCA, while still accepting Lakoff's framework. McCawley states of the analysis in which a quantifier is predicated of an NP:

> Mc 1
> While this analysis is plausible in the case of quantifiers which refer to the (absolute or relative) number of individuals with a certain property, it is much less so in the case of <u>all</u>, <u>every</u>, <u>each</u>, <u>any</u>, and <u>some</u>.

I agree with this point, and above I showed how <u>many</u> and <u>every</u> differ in important syntactic and semantic respects. McCawley, however, rejects any such syntactic argument, declaring that

> I have no objection to underlying structures in which an item appears in a position where the corresponding English word is not allowed in surface structure...

He asserts that the only relevant distinction is a semantic

one. It seems to me that this position entails that the differing syntactic properties of the different quantifiers represent only an accidental distributional fact. One interesting point in that regard is that the only semantic argument McCawley gives for distinguishing the quantifier classes is incorrect. He correctly states that the quantifiers listed in Mc 1 above do not attribute a property to the NP's they modify (while, I assume, for McCawley quantifiers such as many or seven do). But as illustrations of this, he gives the following two sentences.

Mc 2 Every philosopher contradicts himself

Mc 3 Every wife-beater smokes a pipe

McCawley observes that even if the set of philosophers who contradict themselves happens to be identical with the set of wife-beaters who smoke pipes, one cannot deduce Mc 3 from Mc 2. But note that the entailment relation is by no means straightforward even in the case of a quantifier that McCawley would be willing to generate in predicate of NP position. Consider sentences like the above with every changed to many.

Mc 4 Many multi-millionaires pay no taxes

Mc 5 Many Americans own giant oil companies

Even if the set of multi-millionaires who pay no taxes is

identical to the set of Americans who own giant oil companies, Mc 5 can only marginally be deduced from Mc 4. This is so because many is generally used as a term of relative quantity, hence many multi-millionaires will represent a smaller number of people than will many Americans. More significant is the fact that some, a quantifier that McCawley would class with every, produces flawless entailments in parallel situations. Compare Mc 2' and 3' with Mc 2 and 3.

Mc 2' Some philosophers contradict themselves

Mc 3' Some wife-beaters smoke a pipe

Here, if the set of philosophers who contradict themselves is the same as the set of wife-beaters who smoke a pipe, one can deduce Mc 3' from Mc 2'. Hence, the semantic test McCawley has proposed would, contrary to his stated intuitions, distinguish between some and every, and many might even be classified with the latter.

Derivational Constraint 1" above crucially depends upon semantic scope being representable in deep structure. I have argued that such representation is faced with many difficulties, but in the following discussion, I will assume that those difficulties can be resolved. I will argue that even if the necessary deep structures can be motivated, DCA cannot be maintained in the form that has been presented.

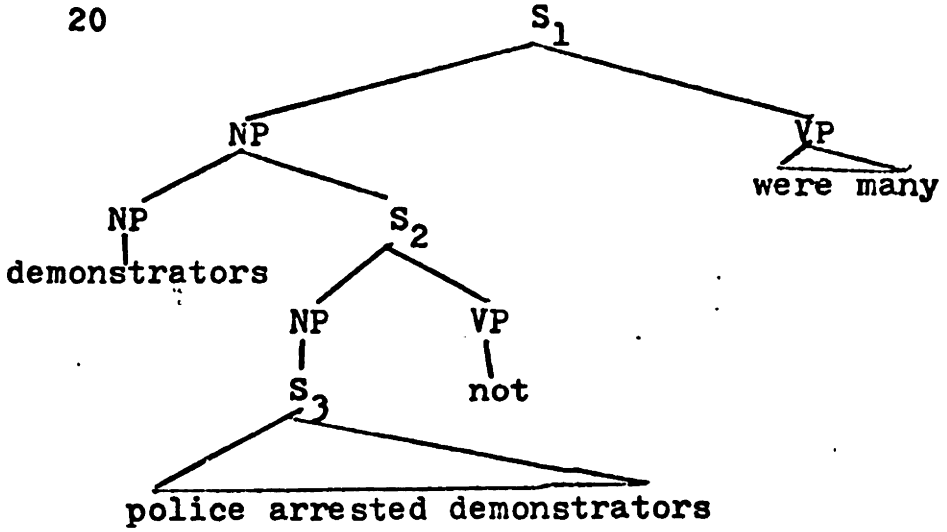
2.1 The Stronger Derivational Constraint

If the Derivational Constraint concerning scope phenomena mentions only deep structure (i.e. semantic structure within DCA) and late derived structure, its effect is equivalent to a derived structure interpretive rule. (It is not the case, however, that there would be no empirical difference between the two positions, since DCA requires deep structures and transformations that have not been syntactically motivated.) If it could be shown that the order of quantifiers at every stage in the derivation must be constrained, this would be a strong argument for DCA. Lakoff (1969) suggests that the scope DC is 'strongly' global in this way. His Constraint 1" (given in 7 above) is formulated as a constraint on the entire derivation. In Lasnik (1971a), I argue that Constraint 1" is too strong in that it makes incorrect predictions by ruling out well-formed sentences. Consider the following sentence which was first discussed by Jackendoff (1969), and which was also discussed by Lakoff (1969).

19 Many of the demonstrators weren't arrested by the police

Lakoff would presumably give 20 as the deep structure for 19.

20



The dialect which Lakoff is considering (p. 128) is that in which 21 unambiguously means 22.

21 The police didn't arrest many of the demonstrators

22 The police arrested few of the demonstrators

It is this dialect that Constraints 1' and 1" describe, since in 20, many commands not; therefore 21 could not be generated from 20 since in 21 not both precedes and commands many. It would appear, then, that unless passive applies on the S_3 cycle, quantifier lowering will never be permitted to apply on the S_1 cycle. But now consider sentence 23.

23 Many of the demonstrators, the police didn't arrest (in particular, John, Bill, Tom,...)

Every speaker that I have asked, including those who balk at interpreting 21 as 19, finds 23 and 19 synonymous. But what is the derivational history of 23? On the S_3 cycle, no relevant transformations apply, and in particular, passive does not apply. On the S_2 cycle, not is lowered into the deepest sentence. (The lowering transformations are claimed by Lakoff (1969) to be cyclic.) On the S_1 cycle, many is lowered onto demonstrators, and it is at this point that Constraint 1" should throw out the derivation, since not now both precedes and commands many. But the post-cyclic rule of topicalization fronts many thereby undoing the damage caused by failure to elect passive on the S_3 cycle. Since 23 is synonymous with 19, it is necessary to disregard the crossing violation just in case a re-crossing later occurs. Notice that it is not even crucial to this argument that topicalization be post-cyclic (though it apparently is post-cyclic). Structure 20 can be embedded inside another sentence, and the quantified NP can be topicalized to the front of the whole sentence, and the same scope facts obtain. In all relevant respects, the behavior of 24 parallels that of 23.

24 Many of the demonstrators, I am certain that the police won't arrest

That is, 24 can mean that it is true of a particular set of demonstrators that I am certain that the police will not

arrest them. 25 is an example of the same phenomenon since the negation inherent in refrain would be subject to Constraint 1".

25 Many of the demonstrators, I am certain that the police will refrain from arresting

Before I proceed with this argument against the strong version of Lakoff's Derivational Constraint, a brief digression will be in order. As I commented above, for many speakers, sentences like 21 are ambiguous, having readings in which many is either inside or outside the scope of not. The dialect that Constraint 1" accounts for, however, is that in which many in 21 is unambiguously within the scope of not. Lakoff (1969) discusses the following sentences, for example.

26 Not many arrows hit the target (L's ex. 21)
27 Many arrows didn't hit the target (L's ex. 22)
28 The target wasn't hit by many arrows (L's ex. 23)

Lakoff prefaces his description:

> Jackendoff reports that in his speech 23 is synonymous with 21, but not 22. I and many other speakers find that 23 has both readings, but that the 22 reading is 'weaker'; that is, 23 is less acceptable with the 22 reading. However, there are a

> number of speakers whose dialect displays the facts reported on by Jackendoff, and in the remainder of this discussion we will be concerned with the facts of that dialect.

On the basis of 1' and 1" (my 6 and 7 above), it is not immediately apparent how the ambiguous dialect (Lakoff's dialect, for example) can be described. That is, in 28 above, many must somehow be permitted to be outside the scope of negation. It is apparent that the derivational constraint cannot simply be made optional or non-applicable in certain dialects, since, to my knowledge, parallel ambiguities do not obtain in 27. For me, 28 can be synonymous with either 26 or 27, but 27 cannot by synonymous with 26. In a footnote, Lakoff does give some attention to such ambiguities.

> ... the general principle here seems to be that where the asymmetric command relation is lost in derived structure, then either one or another of what Langacker (1966) calls 'primacy relations' must take over. One is the relation 'has much heavier stress than'; the other is the relation 'precedes'. These relations seem to form a hierarchy with respect to this phenomenon in such [i.e. ambiguous HL] dialects:
>
> 1. Commands (but is not commanded by)
> 2. Has much heavier stress than
> 3. Precedes
>
> If one quantifier commands but is not commanded by another in surface structure, then it commands

> in underlying structure. If neither commands but is not commanded by the other in surface structure, then the one with heavier stress commands in deep structure. And if neither has much heavier stress, then the one that precedes in surface structure commands in underlying structure.

I think that Lakoff's comment contains a substantial amount of truth, although the relevant phonetic consideration seems to be the overall intonation contour of the sentence rather than the stress on particular words. But it is significant that this hierarchy of primacy relations will be of no help to Lakoff in the description of sentences like 23, 24 and 25 above. If there are speakers for whom no stress pattern of 21 makes it synonymous with 19, then according to 1", a derivation beginning with 20 should be aborted as soon as 21 is produced. Consequently there is no way to salvage the derivation to produce 23. But even for a speaker who accepts two readings for 21 (subject to the primacy hierarchy), 1" is too strong. Thus, if the stress of the relevant sentences is determined on the basis of scope relations (here I am proceeding in the spirit of DCA), then at the output of the derivation of 21, <u>many</u> will be assigned a special stress. But 23 has passed through a stage like 21 and been converted by topicalization apparently <u>before</u> the stress or intonation contour rules have applied. Hence, the primacy hierarchy provides no way in either dialect to explain sentence 23.

A similar argument applies in the case of quantificational adverbs (and other types of adverbs, as well). Consider sentence 29, which has readings corresponding to 30 and 31.

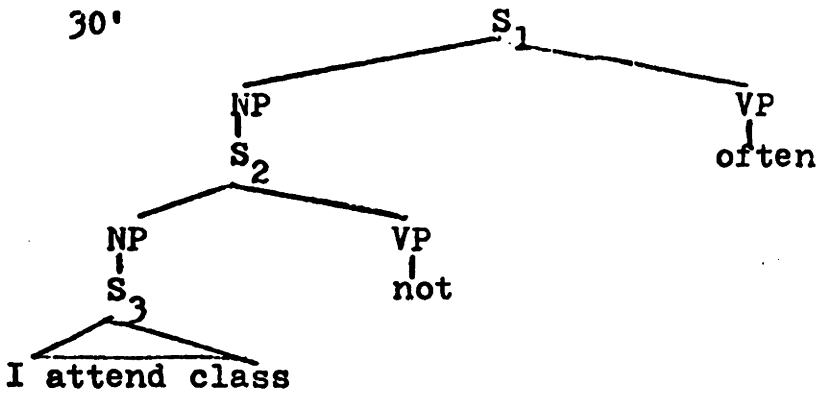
29 I don't attend class often

30 Often, I don't attend class

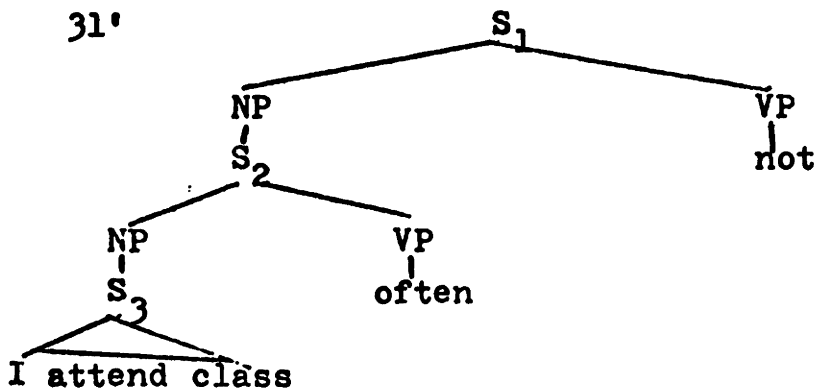
31 Not often do I attend class

According to Lakoff's 1965 and 1969 proposals, 30 and 31 will have deep structures 30' and 31' respectively.

30'



31'



In Anderson (1968) and in Lasnik (1970), several arguments are presented that in derived structure, adverbial phrases cannot be 'above' the remainder of the sentences they appear in. That is, regardless of assumptions about the correctness of deep structures like 30' and 31', in derived structure the adverb must be dominated by the same S node dominating, e.g. "I attend class." The arguments are of two principal types. One type concerns the stateability of the rule permuting adverbs. The second type concerns various kinds of pronominalization. For example, if in sentence 32, the subject of the sentence does not command the subject of the <u>because</u> clause, then backwards pronominalization should be possible as in the ungrammatical 33.

32 George$_i$ beats his wife because George$_i$ loves his wife

33 *He$_i$ beats his wife because George$_i$ loves her

Consider, now, the interaction of the rule of Adverb Lowering with Constraint 1". In deep structure 30', <u>not</u> is lowered on the S_2 cycle; then on the S_3 cycle Adverb Lowering will have to apply. Suppose Adverb Lowering makes the adverb the right-most daughter of the S into which it is lowered. The result will be 29.

29 I don't attend class often.

This is a violation of the quantifier crossing constraints since in 30' *often* commands *not*, while in 29 *not* both precedes and commands *often*. Parallel to the case considered above, 29 (with a reading corresponding to 30') can be rescued by some version of the primacy hierarchy. This is so since when 29 has reading 30' its intonation contour differs from the version of the sentence having reading 31'. If *often* is fronted, however, the primacy hierarchy will not rescue the derivation, since presumably adverb fronting precedes intonation contour assignment. 30 is a fully grammatical output for a derivation preceding from 30'.

30 Often, I don't attend class

Constraint 1" would block this derivation as soon as *often* is lowered into the sentence. Constraint 1", therefore, is incorrect and the source of its incorrectness is precisely that it constrains every stage in the derivation rather than just relating scope to one late level of structure. The correct generalization for the above examples seems to be that a derivation is successful if a crossing of two logical elements is undone by a re-crossing. Thus the intermediate stages of the derivation in these cases not only *can* be disregarded but *must* be.

2.2 Scope and Island Constraints

Lakoff (1970) gives an interesting discussion of scope

phenomena and concludes that any rule assigning scope (either syntactic or semantic rule) must obey various island constraints. He argues that this result is predicted if scope arises from the transformation of deep structures in which scope bearing elements are all predicates into surface structures via a lowering transformation.

> If quantifiers are derived as Carden, McCawley, and I have proposed, by a quantifier-lowering transformation, then these facts [about scope interpretation H.L.] follow automatically, since Ross' constraints apply to transformations....

In general, scope ambiguities have provided much of the motivation for treating as predicates various lexical classes that are not surface predicates. Some examples of this type were presented above in the discussion of Lakoff's (1965) proposals. Lakoff (1970) provides additional cases.

> 34 Did John condone the destruction of many cities (L's VII)
>
> 35 Did John condone America's destruction of many cities (L's VIII)

lakoff gives the following analysis for 34 and 35.

> (VII) may have the reading "Were there many cities that John condoned the destruction of?"

> But (VIII) may not have the reading "Were there many cities such that John condoned America's destruction of them?" Thus the scope of many may be assigned outside of the destruction..., but not America's destruction.... This is exactly what one finds in movement transformations. Thus one can get "Which cities did John condone the destruction of?", but not *"Which cities did John condone America's destruction of?"

McCawley (1970) analyzes another class of scope ambiguities in terms of predicate position. He discusses the following sentence.

> 36 John said that he had seen the woman who lives at 219 Main Street. (M's 18)

McCawley observes that 36 can be used to report a statement by John that he saw the woman who lives at 219 Main Street. Alternatively, 36 can be used if John said something like "I saw Mary Wilson," when the speaker knows that she lives at 219 Main Street. On the basis of such ambiguities, McCawley concludes:

> These facts indicate that in certain kinds of embedded sentences the lexical material relating to noun phrases in the embedded sentence may be either part of the embedded sentence or part of the main sentence.

In the following paragraphs, I will explore the implications of treating such scope ambiguities as structural ambiguities.

2.2a Co-ordinate Structures and Missing Ambiguities

One important case considered by Lakoff (1970) concerns co-ordinate structures and their interaction with opaque contexts. Lakoff points out that while 37 and 38 are each ambiguous, with the scope of the quantifier being inside or outside of the scope of <u>believe</u>, 39 and 40 are not four ways ambiguous but only two.

37 Abdul believes that many men like baba ganouze

38 Abdul believes that few women like baba ganouze

39 Abdul believes that many men and few women like baba ganouze

40 Abdul believes that many men like baba ganouze and few women like baba ganouze

37 can mean "There are many men who Abdul believes like baba ganouze," in which case <u>many</u> is outside the scope of <u>believe</u>. 37 can also mean "Abdul believes that there are many men who like baba ganouze (but he doesn't know which ones)." In the latter situation, <u>many</u> is inside the scope of <u>believe</u>. Similarly, Lakoff states, <u>few</u> can be either inside or outside

the scope of believe in 38. But in 39 and 40, both quantifiers must have the same relationship to believe; there is no reading in which one of them is within the scope of believe while the other is not. Actually, I find 38 rather odd in the reading in which few is outside the scope of believe; and I find an added oddness in conjoining many and few. Consequently, 39 is not a particularly good example. But this in no way lessens the force of Lakoff's observation, since identical results to those cited by him obtain if many is substituted for few in 39 and 40. But what are the implications of the missing ambiguities? Lakoff argues that scope relations must be assumed to obey Ross' co-ordinate structure constraint.

Before commenting on the validity of Lakoff's deduction, I should point out that there are some hidden assumptions that Lakoff has made. The constraints formulated by Ross (1967) explicitly limit two classes of transformations: movement out of certain structures and feature changing into these structures. The lowering rules that Lakoff discusses do not fall into either of those categories; Lakoff is extending Ross' constraints to cover insertion transformations as well, a fact that he does not mention. The second assumption, this one explicitly stated, is that it is a priori meaningless to speak of Ross' constraints except in terms of "syntactic tree configurations and the types of operations that transformations perform on trees." This assumption may well prove unjustified. The co-ordinate

structure constraint in particular may turn out to be a functional limitation on various thought processes. In this light, it is interesting that according to Lakoff (personal communication), the narrative structure of fairy tales obeys the co-ordinate structure constraint. Such a phenomenon should not be surprising since tree formalism (or labelled bracketing) is so general that virtually anything susceptible to formalization can be so represented.

Consider, now, the meaning of 39' (39 modified as I suggested above).

39' Abdul believes that many men and many women like baba ganouze

39' is ambiguous between 41 and 42; 39' cannot mean either 43 or 44.

41 There are many men (namely...) and many women (namely...) that Abdul believes like baba ganouze

42 Abdul believes that many men and many women like baba ganouze (but he doesn't know which men and women)

43 Abdul believes that many men (namely...) and many women like baba ganouze (but he doesn't know which women)

44 Abdul believes that many women (namely...) and many men like baba ganouze (but he doesn't know which men)

The correct generalization is the one Lakoff made: either both quantifiers are semantically outside the scope of believe or both are inside. Lakoff, however, attributed undue significance to that fact. To see that this is the case, examine the unreduced version of 39'.

39" Abdul believes that many men like baba ganouze and Abdul believes that many women like baba ganouze

Like 39', 39" can be synonymous with 41 or 42, but it cannot be synonymous with 43 or 44. But even if Lakoff is correct that scope ambituities arise from quantifier lowering, there is no reason that 39" should be lacking those two readings, since the quantifiers in the two conjuncts should be able to lower independently. Thus it can be safely concluded that the missing ambiguities in 39' provide no evidence for the quantifier lowering analysis.

The parallelism between 39" and 39' represents a very general phenomenon which can be approximately summarized as follows:

45 The Parallel Principle

Co-ordinate structures receive parallel interpretation

45 seems to cover a wide range of ambiguities. In sentence 46, for example, a fish can be either specific or non-specific. But both 47 and 47' have only two readings. There is no reading for either sentence in which one conjunct concerns a specific fish and the other is about an unspecified fish.

46 John wants to catch a fish

47 John wants to catch a fish and so does Bill

48 John wants to catch a fish and Bill wants to catch a fish also

Another example of the same phenomenon is illustrated by the following sentences.

49 Flying planes can be dangerous

50 Sailing boats can be dangerous

51 Flying planes can be dangerous and so can sailing boats

51' Flying planes can be dangerous and sailing boats can be dangerous also

Sentences 49 and 50 each display the well-known ambiguity discussed by Chomsky (1957). But in 51 and 51' both conjuncts

will receive the same interpretation. Hence sentences like 39' are irrelevant, as I have shown, to an evaluation of the syntactic proposal for scope interpretation. 39' is actually a case of the very general phenomenon that I have labelled the Parallel Principle. Obviously, the notion 'parallel interpretation' has only been hinted at here, and deserves further investigation. However, the fact that the notion has not been precisely characterized does not falsify my claim that it rather than the co-ordinate structure constraint is involved in the absent ambiguities discussed.

An examination of a wider range of conjoined structures reveals the interesting fact that scope interpretation does indeed "violate Ross' co-ordinate structure constraint" in many cases. In sentence 52, contrary to what McCawley's noun phrase proposal would predict, Nixon and Goldwater can independently receive a transparent reading.

52 John claimed that Nixon and Goldwater are trying to kill him

Thus, 52 is an accurate report of any of the following four statements by John.

53 Nixon and Goldwater are trying to kill me

54 Nixon and that Republican senator from Arizona who ran for president are trying to kill me

55 The president and Goldwater are trying to kill me

56 The president and the Republican senator from Arizona who ran for president are trying to kill me

Similar ambiguities arise with quantifiers just in case the Parallel Principle does not apply. Sentence 57 is four ways ambiguous, with the quantified phrase and Chomsky independently outside the scope of believe.

57 Iakoff believes that Chomsky and many of Chomsky's students have unjustly maligned him

57 can be correctly used if any of the following represents Iakoff's belief.

58 Chomsky and Bresnan and Fiengo and Lasnik and Wasow have unjustly maligned me

59 Chomsky has unjustly maligned me and I'm sure many of his graduate students have too (though I have no idea which ones)

60 That guy who founded modern linguistics whose name I can never remember, and Bresnan, etc., have unjustly maligned me

61 That guy who founded modern linguistics has unjustly maligned me and I'm sure many of his students have too (though I have no idea which ones)

2.2b Possessivized NP's

The interaction between possessivized NP's and scope interpretation, which I dealt with In Chapter II, provides further evidence against DCA. Consider first a non-possessivized NP containing a quantifier.

62 I couldn't understand the proofs of many of the theorems

Sentence 62 is ambiguous, having readings corresponding to both 63 and 64.

63 I could understand the proofs of few of the theorems

64 There are many of the theorems whose proofs I couldn't understand

In 63 many is inside the scope of not and in 64 it is outside. The latter possibility becomes particularly clear in sentences that do not permit the quantifier to be inside the scope of not. An example of that phenomenon is sentence 65, which is synonomous with 66.

65 I couldn't understand the proofs of certain of the theorems

66 It is true of certain of the theorems that I couldn't understand their proofs

But now consider a sentence like 62 but in which the NP is possessivized and therefore an island.

67 I couldn't understand Euclid's proofs of many of the theorems

As Lakoff would predict, 67 cannot mean 68.

68 I could understand Euclid's proofs of few of the theorems

In Lakoff's framework, many cannot be lowered into the island. But 67 is not ungrammatical; it is well formed on the reading corresponding to 64 above, i.e., on the reading in which many is outside of the scope of not. Hence if quantifier lowering exists it is subject to the following unnatural conditions:

a. Possessivized NP's are islands with respect to quantifier lowering if many is the next higher predicate.

b. Possessivized NP's are not islands with respect to quantifier lowering if not intervened as a predicate at an earlier stage in the derivation.

Conditions a. and b. are not quite right, however. It is generally the case that many can appear in the island but have scope outside the island. Sentence 69 can mean 70, for example.

69 I was able to understand Euclid's proofs of many of the theorems

70 There are many of the theorems (namely...) such that I was able to understand Euclid's proofs of them

Therefore conditions a and b should be replaced with a'.

a' Possessivized NP's are islands with respect to quantifier lowering just in case the next predicate above many is not when many is the quantifier to be lowered.

It hardly needs to be pointed out that a' is ad hoc and unnatural. The fact that DCA requires it is a strong argument against that analysis, and consequently an argument for the analyses I outlined in Chapters I and II, in which Ross' island constraints make exactly the right predictions without any unmotivated modification.

2.2c Other Types of Islands

If Ross' island constraints are extended to govern

insertion transformations, as Lakoff has claimed they should be, then quantifier lowering is a transformation of a very special sort, since quantifiers can appear in any island with scope outside that island. (The same generalization is true of noun phrase lowering in the proposal of McCawley's that I have alluded to.)

First, many can appear in a relative clause even with scope outside the noun phrase containing the relative clause. For example, 71 has a reading synonymous with 72, but in 72 the scope of many is clearly outside of the relative clause. Therefore, DCA would require lowering into a relative clause.

71 An analysis which accounts for many of these facts was recently proposed

72 There are many of these facts (namely...) that an analysis which was recently proposed accounts for

Second, a quantifier can appear in a sentential subject, and even in a sentential subject that is a complex noun phrase, as 73 demonstrates. Further, 74, which is synonymous with one of the available readings for 73, shows that the scope of the quantifier can be outside the scope of the sentential subject and outside the scope of the complex noun phrase.

73 (The fact) that {many / some} of these articles were published amazes me

74 There are {some / many} of these articles (namely...) such that the fact that they were published amazes me

73 is actually a triple violation, assuming that it arises from the syntactic transformation quantifier lowering. Many and some are lowered into a factive sentential subject complex noun phrase.

The scope phenomena dealt with by McCawley which I discussed above display the same freedom to violate island constraints. The following sentence is appropriate even if Lakoff lacks the knowledge of the lecture schedule that would allow him to associate the description "the man who is presenting today's guest lecture" with "Chomsky."

75 Lakoff's belief that he has been unjustly maligned by the man who is presenting today's guest lecture is entirely unfounded.

On McCawley's terms, then, the description is not "part of the embedded sentence," but rather arises outside of the subject NP of 75 and is transformationally repositioned. But this insertion is into a possessivized complex NP that is a sentential subject. Again, if such scope ambiguities result from insertion transformations, such transformations

are clearly not constrained by Lakoff's extension of Ross' constraints. Thus, if that extension can be shown to be valid, then the insertion transformations Lakoff, Carden, and McCawley have proposed are highly suspect.

2.3 The Derivational Constraint on Lowering Rules

Earlier, I showed that the hypothesized strong version of Lakoff's derivational constraint is overly strong in that it rules out several valid derivations. In this section I will demonstrate that even the weaker two-point DC is overly strong. Within DCA, the ambiguity of sentences like 76 can be accounted for, as Lakoff (1969) suggests, by some version of the primacy hierarchy.

76 I couldn't solve many of the problems

In the reading in which <u>many</u> is semantically outside of the scope of the negation, sentence 76 has a special intonation contour. The intonation contour can be said to over-ride the incorrect precede-command relationships. But there are sentences parallel to 76 in which the quantifier is non-negated even though there appears to be no special intonation. Consider the following sentences.

77 I couldn't solve several of the problems

78 I couldn't solve certain of the problems

79 I couldn't solve some of the problems

In 77 - 79, the quantifier is the "highest predicate," in underlying representation. But on the surface not precedes and commands the quantifier. The DC cannot, therefore, be stated in the absolute terms Lakoff has used, even if it is weakened by the primacy hierarchy.

2.4 Relative Clauses and a Surfeit of Ambiguities

Above. I mentioned in passing that Lakoff (1965) claims that sentences like 80 are ambiguous.

80 Did many inmates escape?

On one reading, according to Lakoff, many is the highest predicate and the question "assumes that some inmates escaped and questions whether the number that escaped was great." Before discussing the alleged ambiguity, I want to take up Lakoff's use of the word assume in the above quotation. Apparently, assume here is meant to be equivalent to logically presuppose, since Lakoff (1971, p. 261) explicitly states that "[underlying] restrictive relative clauses are presupposed." But Lakoff gets the first reading for 80 from an underlying structure in which the sentence "Some inmates escaped" is a restrictive clause on inmates. Hence in the reading under discussion, 80 presupposes that some inmates escaped, according to Lakoff. Similarly, the simple declarative sentence, "Many inmates escaped," would also presuppose

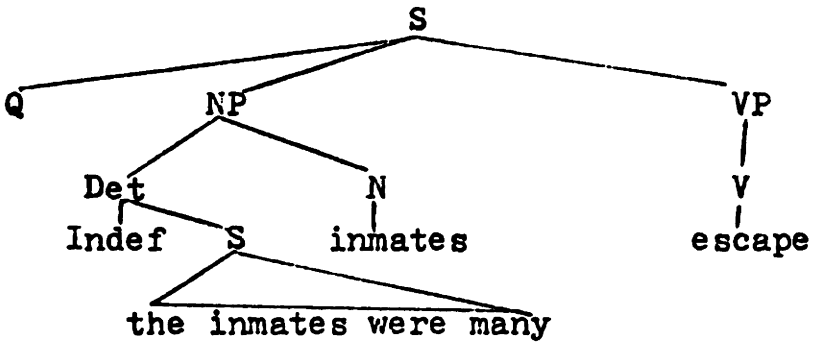
that some inmates escaped, according to Lakoff's principle. But both claims are clearly false. 80 is a well-formed question even if no inmates escaped; and a well-formed discourse could include 80 and the answer 80'.

80' No, no inmates escaped

Further, the sentence "Many inmates escaped" is false if no inmates escaped. If a presupposition were not fulfilled, one would expect the sentence to be lacking in truth value.

On the alternative reading, discussed by Lakoff (1965), 80 is "questioning whether an escape by many inmates took place." In the latter case, the quantifier would be the predicate of a relative clause on <u>inmates</u>, as in 81.

81 (L's F-9-23)



Partee (1970) notes that the meaning associated with 81 is unclear; Lakoff (1970) recants and concurs with this judgment. He states:

> So far as I can tell, the second sense simply does not exist. I also agree with Partee's critique of the mechanism I had set up to account for that sense of [80], namely deriving the quantifier from a restrictive relative clause on an indefinite NP.... This source predicts all sorts of nonexistent ambiguities.... As Partee points out, overt quantificational adjectives like numerous cannot occur in restrictive clauses. If this constraint is generalized to all quantifiers, the excessive ambiguities that Partee points out would be eliminated, and so would the bulk of her objections on this issue.

The excessive ambiguities noted by Partee arise in the following manner. The deep structure for 82 could be any of 82a - 82e.

82 Few people read many books

82a both quantifiers higher verbs

b same as a with relative height reversed

c one quantifier a higher verb; the other in a relative clause

d same as c with quantifiers interchanged

e both quantifiers in relative clauses

The DC on quantifier crossing would exclude b and d, but it would allow a, c, and e. Since the only ambiguity that is available in 82 is a scope ambiguity, that is, an ambiguity arising from a violation of the DC, it is necessary for

Lakoff to find a way to rule out c, d, and e. Preventing quantifiers from appearing in restrictive relative clauses, as Lakoff has proposed, would accomplish this end.

The first question that arises in regard to Lakoff's suggestion is a strictly formal one: If quantifiers can appear as predicates of sentences, how can they be prevented from appearing as predicates of sentences that happen to be restrictive relative clauses? For example, one might suggest that the restriction is a deep structure constraint, perhaps of form 83.

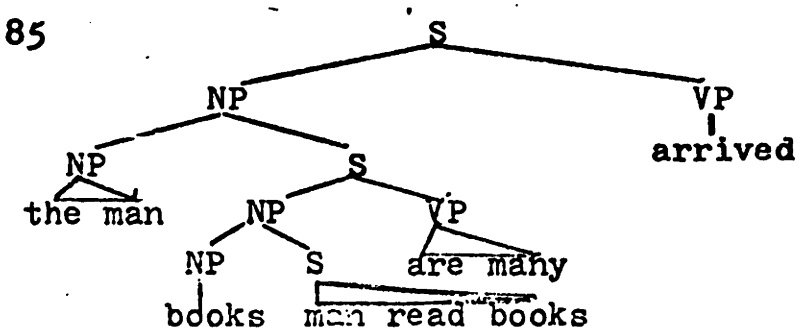
83 No restrictive relative clause can have a quantifier as its predicate.

But 83 is obviously incorrect. The deep structure for 84 would presumably be of exactly the proscribed form within DCA.

84 The man who read many books arrived.

The underlying structure for 84 would be roughly 85, I assume.

85



Lakoff would be required to propose a deep structure constraint something like the following, therefore.

> 86 No restrictive relative clause can have a quantifier as its predicate, unless the subject of the relative clause is not co-referential to the noun that the relative clause modifies.

86 is highly unnatural, and its necessity casts some doubt on the analysis requiring it.

The preceding paragraph presupposed the truth of the claim that quantifiers on noun phrases cannot arise from restrictive relative clauses. Partee's observation showed that that claim is crucial to Lakoff's position; I showed that there is no natural way, within Lakoff's analysis, to capture that generalization. Actually, the situation is worse for DCA than 86 suggests. With 86, unnatural though it is, the extra ambiguities can at least be eliminated, assuming that quantifiers are subject to that constraint. Unfortunately, it appears that those quantifiers that can appear as predicates can do so even in a restrictive relative clause. For example, numerous can appear in predicate position, as in the following example of Lakoff's.

> 87 The men who shaved themselves were numerous

But contrary to Lakoff's claim, numerous can be the predicate

in a restrictive relative also. Consider the situation in which there are two varieties of sandwiches at a banquet, and that there are seven hundred roast beef sandwiches and three peanut butter sandwiches. If the roast beef sandwiches were eaten and the peanut butter sandwiches were not, 88 would be an appropriate description.

88 The sandwiches which were numerous were eaten

88 is not to be confused with 89, in which the relative clause is non-restrictive.

89 The sandwiches, which were numerous, were eaten

In 88, two sets are being contrasted: the sandwiches which were numerous, and those which were not. In 89 there is no such contrast. Lakoff observes that adjectival modifiers with restrictive meaning can generally have heavier stress than the noun they modify, while non-restrictive adjectives will have lighter stress. Contrast 90 with 91 (Lakoff's examples).

90 the industrious Chinese (as opposed to the non-industrious ones)

91 the industrious Chinese

Similarly, in determiner position, numerous can have heavy stress (with restrictive meaning corresponding to 88), or light stress (non-restrictive).

88' The numerous sandwiches were eaten (and the others were not)

89' The numerous sandwiches were eaten (so I'm glad I provided so many)

On the basis of these facts, I conclude that 86 must be rejected. The correct generalization is that whenever an adjective can occur in predicate position, it can occur in predicate position of a relative clause, either a restrictive or a non-restrictive one. Since Lakoff's arguments for the predicate status of quantifiers such as many and few depend on their alleged similarity in behavior to overt quantificational adjectives such as numerous, he is left with no way to explain the non-occurrence of those quantifiers in restrictive relatives. That is, if many is a predicate, there is no obvious way to explain the fact that a sentence parallel to 88' is ungrammatical.

88" *The many sandwiches were eaten

89" The many sandwiches were eaten

Since many and few, which are the most plausible candidates for predicate quantifiers, differ in behavior from

all other predicates, the conclusion seems inescapable that quantifiers are not generated in predicate position.

3 Jackendoff

In an analysis of the interaction of negation and quantifiers that avoids many of the problems facing the DCA, Jackendoff (1969) sought to describe the semantics of scope by means of a surface structure interpretive rule. Jackendoff's 1969 analysis (which I will call the Surface Interpretive Analysis or SIA) proposed deep structures quite similar to surface structures and in which scope semantics is not represented. Transformational rules apply freely to such underlying structures and scope relations are determined on the basis of derived structure configurations.

The syntax of SIA, as presented in Jackendoff (1969) and (1968) is straightforward. Some of the base rules are given in 92.

92 Pre S $\longrightarrow$ (wh) (neg)
NP $\longrightarrow$ Det N
Det $\longrightarrow$ (wh) (neg) Article

An obligatory transformation moves the pre-sentential neg into the auxiliary; no other transformations involve neg. One obvious shortcoming of this syntactic system is its failure to distinguish between incorporated negation and the lexical

item not in their distribution. As I showed in Chapter I, the distribution of not is highly restricted. Except for cases not relevant to scope of negation, some of which were discussed in Chapter I, not can occur only in the Aux, and in the determiner of a derived subject or sentence initial adverbial. The SIA has no mechanism for describing that distribution, e.g., for ruling out sentence 93.

93 *I saw not everybody

This defect is not crucial to Jackendoff's analysis, as it can presumably be remedied by reformulating the base rules so as to make not a distinct base item. Then the correct distribution could be obtained by formulating a transformation referring to not, analogous to the Not Shift transformation proposed in the Determiner Theory in Chapter I.

The semantic scope of negation, according to Jackendoff, is determined in the following manner [my paraphrase]: A negative element can optionally be interpreted as moving from the node X it is attached to in surface structure up to any node X' dominating X, provided that there are no other "logical elements" such as other Neg's attached to X' to the left of the Neg in question. Jackendoff has an interpretive Some-any rule which operates on the output of the scope rule and, among other things, gives the distributional restrictions on negative conditioned indefinites such as any and ever.

In essence, the Some-any rule states that indefinites can occur in positions dominated by the interpreted position of Neg, and cannot occur elsewhere. Conversely "definites" such as some can occur only in positions not dominated by Neg. Incorrect placements of such elements are filtered out; neutral quantifiers, like many, have part of their semantic content filled in by the rule.

A minor objection to that analysis concerns Jackendoff's claim that the structural property relevant to scope of negation is "in construction with" rather than "command." "In construction with" was introduced by Klima (1964). He gives the following definition:

> A constituent is "in construction with" another constituent if the former is dominated by the first branching node that dominates the latter.

Langacker (1969) introduced the notion "command."

> We will say that a node A "commands" another node B if (1) neither A nor B dominates the other; and (2) the S-node that most immediately dominates A also dominates B.

Jackendoff states that "the structural notion 'in construction with neg',...has the semantic correlate 'within the scope of neg'. This lends support to the assertion that in construction with rather than command is the structural

relation in terms of which the some-any rule should be stated." But consider sentence 94.

94 Noone said anything

The presence of the indefinite in 94 shows that the direct object position is, in Jackendoff's terms, within the scope of negation. The negation, however, is within the subject NP, and presumably originates in the determiner of that NP (according to the base rules in 92). But anything is not in construction with neg; it is commanded by neg. One can conclude, therefore, that the relevant structural properties are command, as in 94, and precede to rule out cases in which the indefinite precedes the neg. Thus, a position can be within the scope of negation if neg both precedes and commands that position. With this descriptive mechanism, there will be no need for two rules within SIA. That is, Jackendoff has a scope rule that determines what positions fall under the influence of neg; and he has a some-any rule which interprets a semantic feature onto a quantifier, depending on whether the quantifier is in the scope of negation. The first of these rules can be eliminated by stating the some-any rule directly in terms of the precede-command relationships.

Another difficulty, not inherent in SIA but rather in the form of Jackendoff's argument for it, is an inconsistency in the description of the operation of the Scope rule. The

argument that scope semantics is determined on the basis of derived structure hinges on sets of sentences like the following, in Jackendoff (1969).

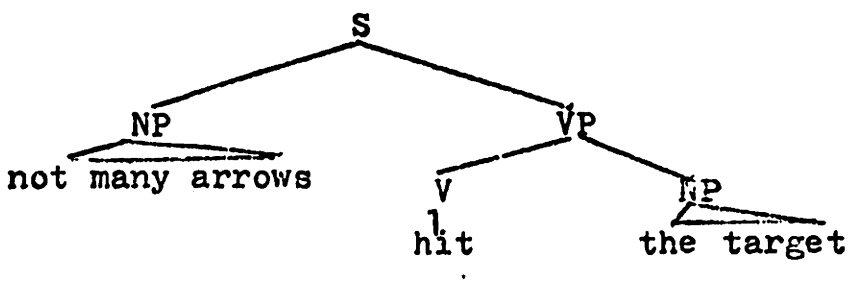
95 Not many of the arrows hit the target

96 Many of the arrows didn't hit the target

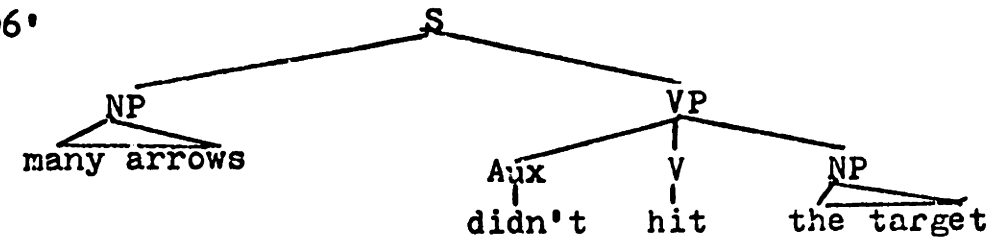
97 The target wasn't hit by many of the arrows

Jackendoff observes that 95 and 96 differ in meaning, and he claims that the passive sentence 97 corresponds in meaning only to 95. In Chapter II and earlier in the present chapter, I discussed the fact that for many speakers sentences like 97 are ambiguous, with meanings corresponding to both 95 and 96. At the moment, however, that fact can be ignored, since what I intend to demonstrate is that Jackendoff's argument is inconsistent with respect to his own data. Since the passive transformation will, Jackendoff claims, produce 97 from either 95 or 96, the scope relations in those three sentences cannot be determined until after that transformation has applied. Jackendoff's scope rule, applying to late derived structure, produces the correct interpretations in the following way. When the scope rule applies 95 and 96 will have, roughly, structures 95' and 96'.

95'



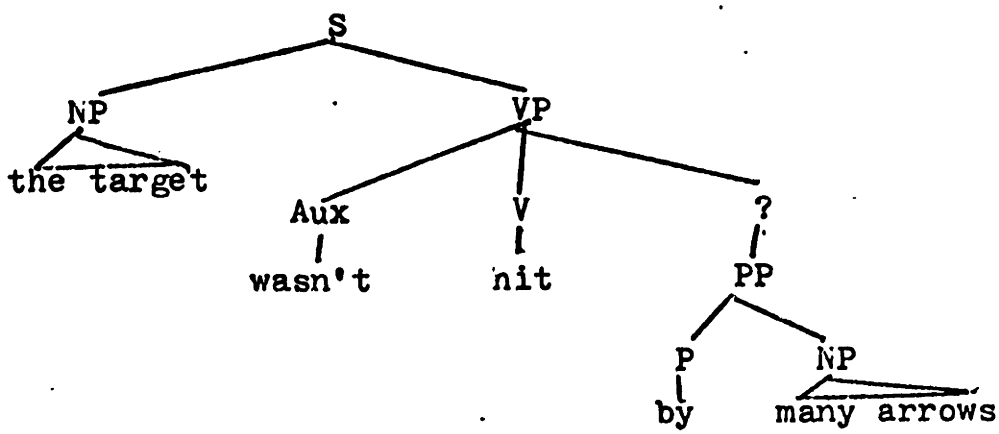
96'



In 95', the scope rule will make either the subject NP or the whole sentence the scope of negation. Since in either case, many will be within the scope, there can be no scope ambiguity. In 96', the obligatory scope of negation will be the VP, since the presence of the quantifier many to the left of the Neg prevents the Neg from interpretively moving up the tree and taking sentence scope. Here also there will be no ambiguity since many is outside the scope of negation.

The crucial case is 97, the constituent structure of which is given in 97'.

97'



Jackendoff claims that the Neg in 97' can have either VP or S scope; but in either case, many is dominated by the interpreted position of Neg. Therefore, there is no scope

ambiguity. Superficially, the argument seems quite convincing, at least for those who get no ambiguity for 97. But a consideration of other examples discussed by Jackendoff shows that SIA has the problems I earlier showed to be inherent in DCA, in the section entitled "The Derivational Constraint on Lowering Rules". Jackendoff (1968) discusses a pair of sentences (my 98 and 99) claiming that their non-syncnomy is a logical consequence of his interpretive scope and some-any rules.

98 Noone saw something

99 Noone saw anything

He correctly observes that in 98 the quantifier is not being negated; that is, that the only available paraphrase is something like "There is something that noone saw." That follows immediately from his rules since if the Neg 'moves' up from subject NP scope to S scope, the resultant reading is anomalous by the Some-any rule because a 'definite' is dominated by Neg. In sentence 99, on the other hand, the Neg must take full S scope, or semantic anomaly will result from an indefinite not being dominated by Neg.

The flaw in the analysis is that Jackendoff tacitly assumes that the subject NP position of Neg is the crucial factor. That is, he assumes that a non-anomalous reading is available for 98 only because the Neg can semantically remain on the NP, NP being a possible scope of negation

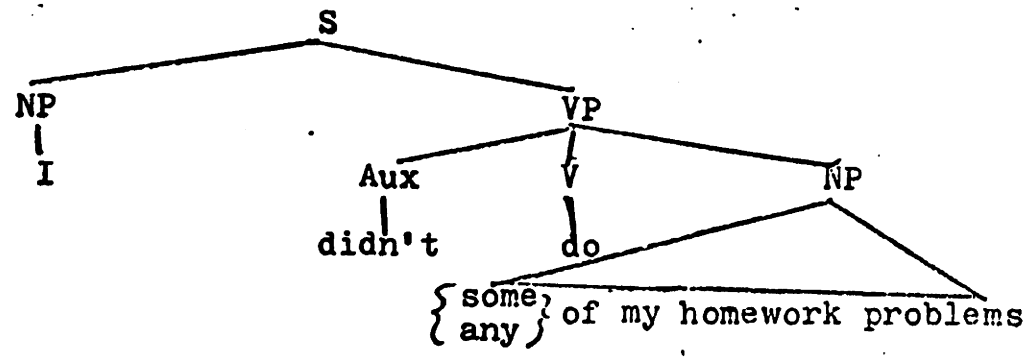
in the SIA. But pairs of sentences precisely analogous to 98 and 99 exist in which the Neg occurs in the VP. Consider the following sentences.

100 I didn't do some of my homework problems

101 I didn't do any of my homework problems

Sentences 100 and 101 bear the same relationship to one another as 98 and 99 above. In 100, the quantifier is not negated, and the sentence can be paraphrased "There are some homework problems that I didn't do." The constituent structure of 100, however, does not permit the analysis given for 98. The relevant aspects of the structure of 100 and 101 are given in 102.

102



The Neg in 102 appears in the Aux. The scope rule will therefore permit it to take either VP scope or S scope. But note that in either case, direct object position is <u>within</u> the scope of negation. Sentence 100 is then incorrectly predicted to be anomalous, since a definite quantifier

some is dominated by the interpreted position of Neg. In 98 and 99, I conclude that it was an accident that the negation appeared in the subject NP; that similar phenomena occur even when the Neg is in the Aux. Therefore, Jackendoff was incorrect in attributing special significance to the possibility of negation remaining on the NP as opposed to taking full S scope.

Since sentence 100 is at least as good as sentence 98, some modification is required within SIA. Actually, the relevant modification is suggested in passing in Jackendoff (1969). In connection with a different set of examples, Jackendoff indicates that in some instances, Aux may be all that is negated. With Aux as a possible scope of negation, 100 is no longer a problem; the negation can remain on the Aux, and object position will not be dominated by the interpreted position of Neg. But this extension of SIA causes major difficulties for Jackendoff's primary argument. Recall that sentences like my 95 - 97 above provided the major argument for Jackendoff's analysis, since it appeared to be a surface structure phenomenon that the passive sentence 97 corresponded only to 95, not to 96, for Jackendoff. If negation can remain on the Aux, however, as in 100 above, then presumably it can do so in 97, as well. Thus, SIA will predict that 97 is fully ambiguous between 95 and 96. Since when it is appropriately revised to account for 100 and 101 above SIA makes incorrect predictions about the very sentences used to motivate it, it cannot be maintained

in the version presented in Jackendoff (1968 and 1969).

Jackendoff (1971) presents a modified version of his interpretive theory, which I will call Modal Structure Analysis or MSA. Several of the difficulties I pointed out in Lasnik (1970) and recapitulated above are resolved in MSA. In this modified analysis, the notion 'scope of negation' no longer refers to 'in construction with' and no longer depends on constituent structure other than S nodes. Scope of negation is now "everything commanded and to the right [of the neg] in surface structure."

Within MSA, Negative is a modal operator operating on anything to its right which it commands, in surface structure. It operates to produce readings of the following form:

103 "The condition C_{neg} applied to NP's [and apparently adverbs, as well - HL] dependent on Neg is that there is no identifiable referent at all."

One minor objection to Jackendoff's formulation is his vagueness about the optionality of the rule. At one point, he gives sentence 104 and observes that <u>many</u> can be either specific or non-specific, in his terminology, depending on the intonation contour of the sentence.

104 Fred didn't buy many of the eggs

From this he concludes that the operation of C_{neg} is optional.

Perhaps a more reasonable conclusion to draw on the basis of that example alone would be that C_{neg} is obligatory, but is sensitive to intonation contour. Later, however, Jackendoff indicates that the non-application of C_{neg} produces marginal or ungrammatical sentences. Thus, he states that 105 (his 52a) is "at best marginal" if many is understood as non-negated.

105 I didn't see many of his friends

If 105 excludes the possibility that the quantifier is non-negated, then 106 should be ungrammatical, which it is not.

106 I didn't see several of his friends

A similar difficulty arises in Jackendoff's discussion of adverbs. He claims that in 107, but not in 108, the adverbial phrase can have a 'specific' reading.

107 Very often Tom didn't go to town

108 Tom didn't go to town very often

If C_{neg} is optional, as Jackendoff earlier claimed, 108 should have one reading fully synonymous with 107. If C_{neg} is obligatory for adverbs, then 109 will incorrectly be predicted to be ungrammatical.

109 Tom didn't go to town on several occasions

A further difficulty arises in Jackendoff's analysis of possible scope categories. He states,

> ... the level at which scope is determined seems to be correlated precisely with the type of scope, which in turn seems to be correlated with lexical category.

He classes verbs and adjectives in copula position as taking "type I scope." The following partial characterization of type I scope is given.

> ... it appears that the determination of which NP's are within the scope takes place at the level of deep structure. For example, an NP can be passivized out of the object of expect and still retain its non-specificity... or an NP can be topicalized out of the object of want...

Jackendoff describes the distributional restrictions on any in terms of C_{neg} and scope type. Any can therefore occur within the bounds of a negative of scope type III (i.e. to the right of and commanded by a negative morpheme such as not or no). And it can occur in the bounds of a negative of scope type I (i.e. in the complement of a negative verb or adjective). Consider, in this regard, sentence 110.

110 It is unlikely that anyone will show up

The analysis of 110 is straightforward in terms of MSA. Unlikely is a negative morpheme of type I; therefore any can occur in its complement, as determined in deep structure. But now consider 111, which presumably is transformationally derived from 110.

111 *Anyone is unlikely to show up

Since type I scope is determined in deep structure, the transformation of subject raising should not be relevant, and 111 should be grammatical.

In conclusion, Jackendoff's MSA seems to be a substantial improvement over SIA, in that it handles in a general way most of the data presented in Lasnik (1970). On the other hand, while the difficulty about scope type classification seems rather peripheral to Jackendoff's major arguments, MSA's vagueness about optionality of C_{neg} is an important drawback that somewhat limits its explanatory power.

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BIOGRAPHICAL NOTE

The author was born in Washington, D.C. on July 3, 1945. In 1950, his family moved to Pittsburgh, where he received his elementary and high school education. He graduated from Taylor Allderdice High School in 1963. From 1963 until 1967, he attended Carnegie Institute of Technology, first in mathematics and then in both mathematics and English. From 1963 until 1965, he had a Carnegie Scholarship, and from 1965 until 1967, he had a scholarship from the Pittsburgh Plate Glass Co. In the spring semester of 1966, he was an undergraduate teaching assistant in the Mathematics Department, and in the summer of 1967, he had a fellowship from the Carnegie Foundation to study the teaching of mathematics. He was elected to Phi Kappa Phi academic honorary, and to Pi Delta Epsilon journalism honorary for his work on the Carnegie Technical magazine where he co-authored a monthly column on mathematics and logic; on Patterns literary magazine where he was a member of the editorial staff; and on the newspaper Carnegie Tartan where he was a film critic. From 1967 to 1969, he was a graduate student in English Literature at Harvard University, where he had a Woodrow Wilson Fellowship and a Harvard Graduate Prize Fellowship. In 1969, he transferred to M.I.T.'s Linguistics Department, where he had an NSF Graduate Fellowship from 1969 until 1971, and an NIH Training Grant through 1972 when he completed the Ph.D. program. He was an invited participant at the 1970

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His publications in linguistics are "A Derived Nominal Requiring a Non-Sentential Source" with M. Brame in Linguistic Inquiry Volume 1, Number 4; "On the Notion 'Stronger Derivational Constraint'" in Quarterly Progress Report of the M.I.T. Research Laboratory of Electronics Number 100; "A General Constraint: Some Evidence from Negation" in QPR 101; and "On the Descriptive Adequacy of Interpretive Theories" with T. Wasow in Foundations of Language Volume 7, Number 3.