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ABSTRACT

Constraining linguistic metatheory by demanding that it allow the construction of grammars for all the frequently occurring idiolects of standard American English is shown to narrow the choices among competing theoretical positions. In this way data from a nonhomogeneous speech community are used to illuminate rather than cloud a theoretical question. "While"-clauses are taken as exemplary of the class of English adverbial clauses in general and temporal clauses in particular. In surface structure, "while"-clauses are shown to be Chomsky adjoined to the verb phrase if postposed and to be attached directly to the S-node if preposed or medial. Following M. Geis (1970) the internal structure is shown to be that of an adverbial relative clause. A rule of Oblique Equi-NP Deletion is motivated to account for subjectless "while"-clauses. Two alternative deep structure sources for "while"-clauses are discussed: The higher-S and lower-S analyses. Data from 345 native speakers of English are shown to require the construction of three distinct grammatical descriptions of the constraints on Oblique Equi-NP Deletion. Requiring that linguistic theory allow just these grammars to be written eliminates the possibility of constructing grammars in which no rules are extrinsically ordered. The higher-S analysis is shown to require a serious violation of the Strict Cycle Condition, while the lower-S analysis is shown to require the use of an ad hoc category and to predict the existence of a dialect of dubious existence. (Author/KM)

WHILE-CLAUSES IN ENGLISH

by

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S. E. L.
September, 1974

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WHILE-CLAUSES IN ENGLISH

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Two modes of linguistic analysis, involving abstract deep structures (generally associated with generative semantics) and surface-like deep structures (generally associated with interpretive semantics), are available with little to tell us about which is right. In addition there are at least three types of rule ordering constraints that can be incorporated into grammars (all rules extrinsically ordered, some rules extrinsically ordered, and no rules extrinsically ordered). Constraining linguistic metatheory by demanding that it allow the construction of grammars for all the frequently occurring idiolects of standard American English, is shown to narrow the choices among these competing theoretical positions. In this way data from a nonhomogeneous speech community are used to illuminate rather than cloud a theoretical question.

While-clauses are taken as exemplary of the class of English adverbial clauses in general and temporal clauses in particular. In surface structure, while-clauses are shown to be Chomsky adjoined to the verb phrase if postposed and to be attached directly to the S-node if preposed or medial. Following M. Geis (1970) the internal structure is shown to be

that of an adverbial relative clause. A rule of Oblique Equi-NP Deletion is motivated to account for subjectless while-clauses. Two alternative deep structure sources for while-clauses are discussed: The higher-S and lower-S analyses.

Data from 345 native speakers of English are shown to require the construction of three distinct grammatical descriptions of the constraints on Oblique Equi-NP Deletion. Requiring that linguistic theory allow just these grammars to be written eliminates the possibility of constructing grammars in which no rules are extrinsically ordered. The higher-S analysis is shown to require a serious violation of the Strict Cycle Condition, while the lower-S analysis is shown to require the use of an ad hoc category and to predict the existence of a dialect of dubious existence.

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CHAPTER 1: INTRODUCTION

The power of transformational theory is so great and the empirical constraints on it are so meager that it is often difficult to decide which of two or more competing analyses of a linguistic phenomenon should be preferred. As a case in point one need only note the existence of two competing trends in modern linguistic analysis: abstraction and surfacism. The first of these trends is characterized by a sparseness of category types and a tendency to analyze sentences as deriving from abstract structures containing embedded sentences and a number of hypothetical lexical items which do not appear in surface structure. The second of these trends, surfacism, is characterized by a proliferation of category types and a tendency to analyze sentences as deriving from relatively 'flat' underlying representations which share a good deal of bracketing with the corresponding surface structure representations. In general, practioners of each of these styles of analysis have been unable to convince advocates of the other that their analyses are preferable.

Another example of two competing modes of analysis can be found in recent arguments over rule ordering. Most analysts tacitly assume that all rules are extrinsically ordered with respect to each other. Some, however, have argued that some and possibly all rules in a grammar should be left extrinsically unordered (Koutsoudas, Sanders and Noll, 1971; Koutsoudas, 1972; Ringen, 1972). It is clear that the two extreme positions on rule ordering could, other things being equal, result in strikingly different formulations of grammatical

rules for the same set of data.

This state of affairs can result only because of the difficulty of bringing empirical evidence to bear which can be used to choose between competing analyses. In some cases this is so because the competing analyses are notational variants that can account for the data equally well (or poorly). In these cases it is necessary either to choose the most useful formulation for the analyst's purposes, or else to attempt to prove that the different analyses are not true equivalents, but make distinct empirically testable claims. In part, however, the inability of the advocates of competing theories to convince one another of their analyses is due to the disquietingly unreliable nature of linguists' prime source of data: acceptability judgments. The linguist who is uncertain of his judgments can either abandon his line of inquiry or simply adopt his best guesses and report the fact. But an analyst who says of his introspections, 'My judgments are uncertain in these cases,' or 'Judgments are somewhat uncertain, but it seems to me that these conclusions are correct,' or 'While judgments are not entirely trustworthy, the conclusions seem to me plausible' (Chomsky, 1973: pp. 251, 259, 260) cannot expect others to accept his analyses on rational grounds.

It is of course possible to attempt to resolve uncertainty of this type by asking other speakers what their judgments are. If one is lucky, he will find speakers who are in agreement with each other and who are certain of their judgments. More commonly, however, the investigator will discover that either his informants are also

uncertain about their judgments or that they will disagree with one another. In cases in which different investigators have different empirical data, it is inevitable that their analyses will differ.[1] These difficulties stem from the fact that the objectivity and replicability of data based solely on introspection by a grammarian are always open to question. When such doubts arise it is not sufficient to base one's reliance on introspection on an appeal to the abstraction of an ideal speaker-hearer in a homogeneous speech community. Nor is it sufficient to appeal to the distinction between competence and performance. The only data available to us is performance data, whether it be in the form of language use or judgments about language.

The problem is how to proceed with linguistic investigations in light of speaker variation with respect to the critical sentences. The approach taken in this study is (1) to elicit sets of acceptability judgments from sizeable groups of informants, (2) to determine which patterns of judgments occur sufficiently frequently to justify analysis, and (3) to analyze the lects[2] associated with these patterns. This approach to the analysis of language raises two new problems: one statistical and one theoretical.

1. How can we tell which patterns (lects) occur with above chance frequency?
2. How should the analyses of the different patterns (lects) be related?

The statistical problem is partially resolved through the use of a Sheffé-type multinomial analysis (see Chapter 3). The theoretical

question has been resolved by replacing the idealization of a homogeneous speech community with what might be called the minimal difference assumption: Barring evidence to the contrary, the grammars of related lects should be assumed to be minimally different. The justification for this assumption will be presented later.

Empirical questions can, of course, only be investigated using concrete examples of a language. One area of English in which the basic outlines of both abstract and surface analyses are reasonably clear is adverbial clauses. The theoretical issues raised above will be discussed in the context of the analysis of temporal (i.e., non-concessive) while-clauses in English. M. Geis (1970) classes while-clauses as 'adverbial relative clauses,' and claims that they are derived from relative clauses whose heads are prepositional phrases. J. Geis (1970) accepts this analysis and extends it by claiming that locative and temporal adverbial phrases and clauses derive from underlying structures in which the adverbials originate in higher sentences than the surface main clauses with which they are associated. J. Geis argues, in fact, that locative and temporal prepositions originate as the main verbs of these higher sentences. Schreiber (1968) has argued that the general class of sentence adverbs in English should be derived from higher sentences.

By contrast, Jackendoff (1969) argues that introducing a node ADV in deep structure in one of the positions in which we find adverbs in surface structure is preferable to deriving ly-adverbs transformationally. In addition, Jackendoff (1973) has argued that

prepositional phrases are introduced by the phrase structure rules within the main clause in which they appear in surface structure. Bowers (1970a) has gone so far as to propose that ADV is parallel to categories such as N and V. He claims that adverbials are recursive and that there are strong similarities between the structure of adverbials and the structure Chomsky (1970) has posited for nominals. Bowers suggests that the X-bar convention be extended to the analysis of adverbials. Although he does not explicitly discuss temporal and locative adverbials, it is reasonable to suppose that Bowers would want to analyze while-clauses as complement plus sentence embedded in an ADV-structure. Alternatively, it is conceivable, though unlikely, that a pleasing blend could be put together of Jackendoff's analysis of prepositional phrases and an analysis of while-clauses such as M. Geis's in which their internal structure is essentially that of relative clauses. Since Geis's analysis involves positing an abstract verb that is transformationally deleted as the result of the process that creates the complementizer while, it seems doubtful that any surfacist would be attracted by his analysis.

To further complicate matters, the data on the acceptability of sentences containing while-clauses are persistently heterogeneous. The sentence 'The people saw Sophia Loren while standing in the rain' is ambiguous for some speakers and unambiguous for others. Those who treat the sentence as ambiguous say that either the people or Sophia Loren are standing in the rain. Those for whom the sentence is unambiguous have only the reading on which the people are stated to be

standing in the rain.[3] Furthermore, some of the speakers for whom the sentence is unambiguous find the corresponding passive sentence ambiguous. Not surprisingly the speakers who find the first sentence ambiguous also find its passive ambiguous. Only rarely is a speaker encountered who finds the passive but not the active ambiguous. The speakers of these various lects cannot be grouped by any known geographic or socioeconomic means.

It is clear that facts such as these cannot be accounted for by any theory that assumes a homogeneous speech community. They could be dismissed as mere performance data, but this course of action is unsatisfactory for a number of reasons: (1) All empirical data that we deal with are in the last resort performance data. The question is not whether any given datum is the result of performance, but which data should we abstract away from and which should we be certain to reflect in our theories of grammar. (2) The data are far from random in these sentences. Speakers' judgments show a strong implicational relationship among the sentences in question. Only a small number of the logically possible response patterns have been observed with any frequency among the population. And finally, (3) Speakers typically seem quite certain about their judgments of a given sentence. In light of these facts, it seems reasonable to demand of grammatical theory that, at the very least, it allow us to describe the subtle differences among such closely related and randomly distributed lects in a simple and economical manner. To the extent that this demand can be given substance, it amounts to a constraint on the class of grammatical theories that are consistent with the observed data.

The question immediately arises as to whether this new type of empirical constraint on the validation of grammatical theories and grammars can assist us in choosing among the competing grammatical theories that are on the linguistic market. As will be shown later, the incorporation of the class of facts noted above into either generative semantics or interpretive semantics imposes strong constraints on the forms of English grammars that these theories allow. Unfortunately, both approaches to syntax are shown to have serious defects. It is clear that until these defects are overcome no current theory of generative grammar can account for the kind of widespread and regular data that are discussed in this thesis.

NOTES TO CHAPTER 1

1. Two cases of just this sort have been pointed out by Carden (1973): 1) Chomsky (1957) bases his argument that transformations change meaning on the claim that sentences (a) and (b) have no readings in common.

   a. Everyone in the room knows at least two languages.

   b. At least two languages are known by everyone in the room.

   Katz and Postal (1964) argued that nearly identical sentences were ambiguous and shared two readings. 2) Postal's (1970) analysis of remind has been attacked by Bolinger (1971), Bowers (1970b), Kimball (1970) and Wolf (1970) on the grounds (among others) that Postal's judgments on critical sentences were wrong.

2. Lect is used here as a neutral term to describe any group of idiolects which share response patterns and hence presumably rules over some well-defined portion of the grammar.

3. Both sets of speakers can, of course, make the pragmatic inference that both the people and Sophia Loren are standing in the rain.

CHAPTER 2: THE STRUCTURE OF WHILE-CLAUSES

2.0 Introduction

Before discussing the two main alternative analyses of the transformational history of while-clauses, it will be convenient to analyze the surface structure of while-clauses and their internal structure. After this has been done a rule of Oblique Equi-Noun Phrase deletion will be motivated that accounts for sentence pairs such as (1) and (2).

1. a. John was a fireman while he was in Detroit.
   b. John was a fireman while in Detroit.
2. a. The people saw Sophia Loren while they were enjoying themselves.
   b. The people saw Sophia Loren while enjoying themselves.

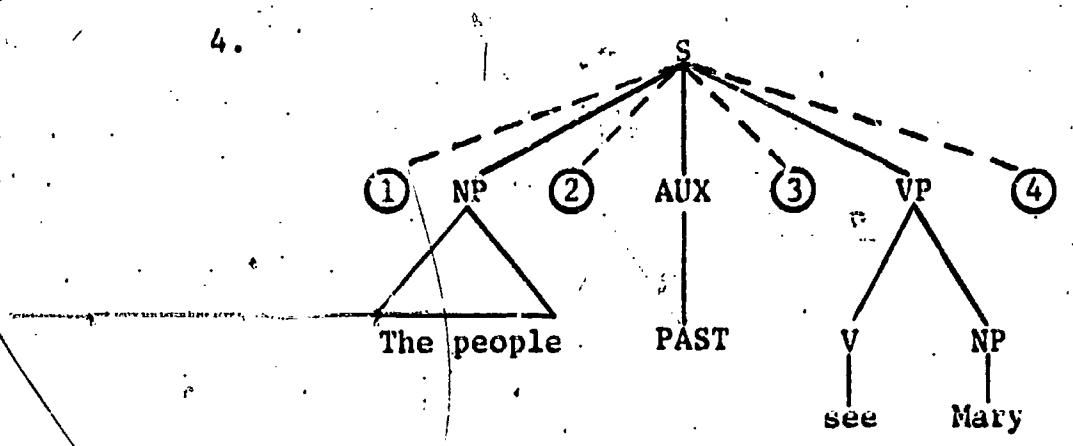
2.1 The Surface Structure of While-Clauses

While-clauses can occur sentence initially, finally or medially as illustrated by sentences (3a - c).

3. a. While they were watching TV, the people saw Mary.
   b. The people saw Mary while they were watching TV.
   c. The people, while they were watching TV, saw Mary.
   d. *The people saw, while they were watching TV, Mary.

Sentence (3d) shows that sentence internal while-clauses cannot occur inside the verb phrase.[1] These facts can be accounted for and predicted if we assume that the while-clauses are attached as daugthers of the matrix S-node as indicated schematically by the circled nodes in (4).

4.



It is clear that the rule that places while-clauses in position 3 is instrinsically ordered after Affix Movement. If it were not, Affix Movement would be blocked whenever a while-clause was placed in position 3 and the sentence would be marked ungrammatical by the grammar because of the noncliticization of the tense formative. That while-clauses can in fact be moved into position 3 can be seen in sentences containing modals such as (5a) and in copular sentences such as (6d).[2]

5. a. The people could, while (they were) watching TV, see Mary.

   b. The people, while (they were) watching TV, could see Mary.

6. a. John was a fireman while (he was) living in Detroit.

   b. While (he was) living in Detroit, John was a fireman.

   c. John, while (he was) living in Detroit, was a fireman.

   d. John was, while (? he was) living in Detroit, a fireman.

The claim that while-clauses are daughters of the S-Node in (4) seems reasonable for initial and medial while-clauses on the grounds that intonation indicates that they do not form a single constituent with the

subject NP, the auxiliary or the VP. Intonational arguments cannot, however, be used to argue that postposed while-clauses (position 4) are constituents distinct from the VP. Furthermore, as sentence (7a) illustrates, do so, which only replaces constituents, can simultaneously replace both a verb phrase and a following while-clause. Note, however, that do so can replace just the verb phrase of the main clause without affecting a following while-clause.

7. a. Zorro continued to fight while he protected a bruised arm and his opponent did so too.

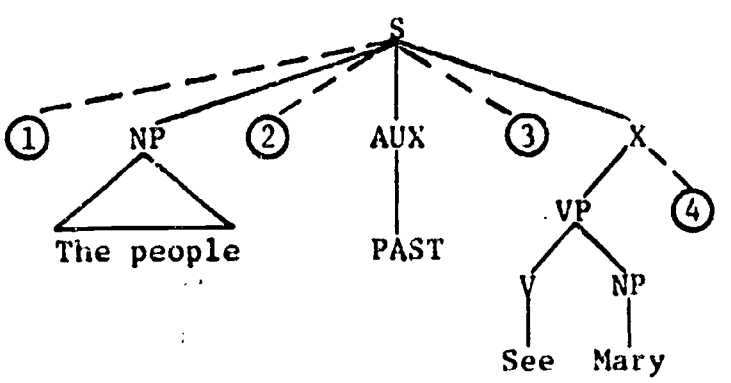
   b. Zorro continued to fight while he protected a bruised arm and his opponent did so while favoring a weak knee.

Right Node Raising (Maling, 1972), which only raises constituents, also indicates that postposed while-clauses are in the same constituent as the VP.

8. Zorro would certainly and his opponent would probably continue to fight while nursing a bruised arm.

Thus, on the basis of the evidence presented so far, (9) would appear to be a more accurate representation than (4) of the four alternate positions in which while-clauses can appear in surface structure.

9.



In order to determine what sort of node or nodes dominate while-clauses in surface structure it is necessary to note that the do so rule that Lakoff and Ross (1966) showed replaces repeated verb phrases with do so does not also replace noun phrases and sentences. These facts are illustrated in sentences (10) to (12).

10. a. Mary sang a song and John did so too.
    b. *Mary sang a song and do so, too.
11. a. Mary sang a song and John played it.
    b. *Mary sang a song and John played do so.
    c. *Mary sang a song and do so played it.
12. a. Mary cooked and John ate beans.
    b. *Mary cooked do so and John ate beans.
    c. *Mary cooked beans and John ate do so.

Sentences such as (13) provide a class of apparent counterexamples to the claim that do so does not replace sentences.

13. Mary said that John never smiles because doing so hurts his mouth.

In (10) doing so replaces the nominalized sentence John's smiling. It seems clear, however, that (13) is related to (14) by a subject deletion rule.

14. Mary said that John never smiles because his doing so hurts his mouth.

Thus it is reasonable to conclude that the node labeled 'X' in (9) is in fact a VP node.

Notice that the circles representing while-clauses in (9) cannot simply be replaced by while-clauses dominated by an S node. At

least the while-clauses in the most basic of these positions must also be dominated by a noun phrase in order to allow the clefting rule to operate. Sentences (15) are examples of clefted while-clauses.

15. a. It was while he protected a bruised arm that Zorro continued to fight.

    b. It was while (he was) protecting a bruised arm that Zorro continued to fight.

If while-clauses are dominated by NPs we would expect them to be able to undergo the pseudo-cleft rule as well as the clefting rule. The sentences in (16) apparently demonstrate that this prediction is false.

16. a. *What Zorro continued to fight was while he protected a bruised arm.

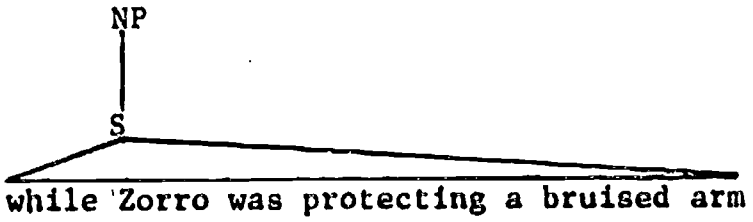
    b. *What Zorro continued to fight was while (he was) protecting a bruised arm.

The sentences in (17), however, suggest that (a) the pseudo-cleft rule can output wh-words other than what as surface subjects, and (b) that noun phrases dominating while-clauses have more structure than is provided by a brancing arrangement such as (18).

17. a. ?While Zorro continued to fight was while he protected a bruised arm.

    b. ?While Zorro continued to fight was while (he was) protecting a bruised arm.

18.



Closely related structures involving when and where exhibit similar acceptance and rejection patterns to those containing while.

19. a. It was when he climbed the wall that Zorro tore his cape.

    b. *What Zorro tore his cape was when he climbed the wall.

    c. When Zorro tore his cape was when he climbed the wall.

20. a. It was where it was deepest that Zorro crossed the river.

    b. *What Zorro crossed the river was where it was deepest.

    c. Where Zorro crossed the river was where it was deepest.

Taken together these facts support the claim that the pseudo-cleft rule accesses the structure of the pseudo-clefted noun phrases and lends strong support to an analysis which claims that while-clauses are dominated by noun phrases.

The fact that while-, when-, and where-clauses can be questioned also supports the claim that all three types of clauses are dominated by NP.

21. a. Zorro refused to fight while he had the measles.

    b. When did Zorro refuse to fight?

22. a. Zorro tore his cape when he climbed the wall.

    b. When did Zorro tear his cape?

23. a. Zorro crossed the river where it was deepest.

    b. Where did Zorro cross the river?

M. Geis (1970) has argued that while-clauses as well as

when-clauses and where-clauses are derived from relative clauses attached to prepositional phrases. J. Geis (1970) has argued that prepositional phrases are derived from verb phrases. One of her arguments is based on the fact that the rule of Verb Phrase Deletion 'seems to treat verb phrases and prepositional phrases similarly.' J. Geis goes on to argue that Verb Phrase Deletion can be used to show that a VP node dominates prepositional phrases in surface structure. It is not difficult to construct sentences parallel to hers in which the surface prepositional phrases have been replaced with while-clauses. Although such discussions do not show the necessity of having VP nodes dominate while-clauses, they do show that such an analysis is consistent with the data.[3]

The sentences in (24) and (25) are J. Geis's examples of the application of verb phrase deletion to verb phrases and prepositional phrases.

24. a. Children watch cartoons on Saturday mornings, but their parents don't.
    b. Frank may have left already, and Jim may have too.
25. a. John was studying in the Library, and Joan was reading Ramparts.
    b. Ralph gives lectures at the university, but his brother only attends classes.
    c. John read for three hours and Joan slept.
    d. John finished his paper on Friday, but Joan was just starting hers.

Parallel examples with while-, when-, and where-clauses are given in (26).

26. a. John was snoring while watching the movie, and Mary was eating popcorn.
    b. Ralph smokes a pipe while he lectures, but his brother chews tobacco.
    c. John reads when he travels, but Joan sleeps.
    d. John handed in his paper when the bell rang, but Joan just began to sob deeply.
    e. John waded where the water was deepest and Mary swam.
    f. John recited soliloquies where Shakespeare once trod, but Mary took snapshots.

Weak evidence is available which indicates that most speakers treat preposed while-clauses as if they were dominated by a VP. An informal questionnaire administered to nine linguistically sophisticated native speakers obtained the responses in Table 1 to sentences (27) to (30).[4]

27. Zorro continued to duel while he protected a bruised arm and doing so too his opponent continued to fight.
28. Zorro continued to duel while he protected a bruised arm and doing so too his opponent fought.
29. Zorro continued to duel while he protected a bruised arm and doing so his opponent continued to fight.
30. Zorro continued to duel while he protected a bruised arm

and doing so his opponent fought too.

Pattern	Sentence 27	28	29	30	Number of speakers in pattern
1	*	*	*	*	2
2	OK	*	*	*	3
3	OK	OK	*	*	2
4	OK	OK	OK	OK	2

Table 1: Acceptability judgments for the substitution of do so for a preposed while-clause.

Some of the informants were also able to find second readings for sentences (29) and (30) on which do so refers to Zorro's actions. These responses are not included in Table 1. Informants who reject (27) must not have a VP dominating the while-clause. The remaining speakers must have a VP dominating preposed while-clauses.

To summarize, four surface structure locations have been identified that can be occupied by while-clauses. In addition it has been shown that while-clauses are dominated by a noun phrase node in surface structure and may also be dominated by a verb phrase node. Evidence from pseudo-clefting has been presented that the NP dominating while-clauses has a richer structure than is depicted in (18).

Taken together these facts suggest that the best way to account for the alternative surface structure positions of while-clauses is to posit a preposing rule which takes position 4 as basic and optionally moves the while-clause into positions 1, 2 or 3. It is clear that

positing a postposing rule that takes position 1 as basic would require complicating the description of such rules as Equi-NP Deletion, Complementizer Placement, Passive and Subject Deletion. Furthermore any rule which derived position 4 from any of the other three positions would need to treat adjunction in sentence final position differently than adjunction in the other positions. The generalization that the rule should express is that the second phrase in a structure of the form $_{VP}[VP\ VP]$ or $_{VP}[VP\ NP]$ (depending on the speaker's lect) is moved to the left to become a daughter of the first S which dominates it. Unfortunately, there is no convenient way to state this with the grammatical mechanisms currently available. Keyser's (1968) Transportability Convention which was intended to cover situations just like this one will not work because it preserves sister relationships. As was shown earlier, while-clauses in sentence final position are not daughters of their simplex S's in surface structure. First approximations to the rule which accounts for the alternate positions of while-clauses are given as (31) and (32).

31. Adverb Preposing (for lects accepting (27)): Optional

S.D.	X	Y	Z	$_{VP}[VP$	$VP]$
	1	2	3	4	5
S.C.	1	5	3	4	Ø

CONDITION 1: Either X and Z are constituents or either X or Z is null.

CONDITION 2: 2 is null. (Predictable if we adopt a constraint prohibiting non-recoverable deletions)

32. Adverb Preposing (for lects rejecting (27)): Optional

S.D.	X	Y	Z	$_{VP}$[VP	NP]
	1	2	3	4	5
S.C.	1	5	3	4	$\emptyset$

CONDITION 1: Either X and Z are constituents or either X or Z is null.

CONDITION 2: 2 is null.

These adverb preposing rules subsume the rule that Ross (1967) variously calls Adverb Preposing and Adverb Prefixing. Ross was specifically concerned with a rule which moved adverbs from sentence final position to sentence initial position. Without repeating his arguments, it should be noted that Ross concluded that his rule must be last cyclic and upward bounded. He eventually reformulated the upward boundedness condition in terms of command: The sentence initial segment to which Ross's rule sister adjoined the adverb must command the adverb before it is moved. Both of these conditions can be added to (31) and (32), although it is easier to state the upward boundedness condition as a constraint on the structural change rather than on the structural description: After Adverb Preposing has applied, 5 must command 4.

Since Adverb Preposing must be allowed to apply after the subject deletion rule which optionally deletes the subjects of <u>while</u>-clauses, (31) and (32) could either be left unordered with respect to the deletion rule or extrinsically ordered after it. On the assumption that extrinsic ordering constraints complicate the grammar, (31) and

(32) have been stated without any explicit ordering constraints. Similarly, since Adverb Preposing is intrinsically ordered after Adverb Lowering, there is no reason to explicitly state extrinsic ordering constraints between these two rules.

2.2 The Internal Structure of While-Clauses

M. Geis (1970) has discussed the internal structure of *while*-clauses and a number of related structures at length. Geis has shown that *while*-clauses may be profitably analyzed as relative clauses attached to prepositional phrases. In addition he has argued that the complementizer *while* is transformationally derived from an underlying durative clause. Since Geis's detailed analysis is the only one to have treated the internal structure of *while*-clauses, the relevant parts of it will be summarized in detail.

Geis proposes three necessary conditions that a clause must meet in order to be a relative clause:

33. A clause is a relative clause only if
    a. it is adjoined to some noun phrase
    b. a noun phrase is moved to initial position in the clause, and
    c. the noun phrase to which the clause is adjoined and the noun phrase which is moved to the front of the clause are identical.[5]

Once these conditions are met by a clause it is possible to argue that a significant economy can be achieved in the grammar by analyzing the clause as a relative clause. For this reason, the conditions of (33)

can be considered as sufficiency conditions as well as necessity conditions.

Three facts support the claim that while-clauses are adjoined to an antecedent NP:[6] 1) They have the same privileges of occurrence as other frame adverbials such as during some time and then (in durative senses), 2) While-clauses pronominalize in the same way as simple time adverbials, and 3) While-clauses behave like complex NPs in that nothing can be moved out of them. The first fact is illustrated by (34) and (35).[7]

34. a. *The concert lasted while I was asleep.
    b. *The concert lasted during the time that I was asleep.
35. a. John was in England while Bill was in France.
    b. John was in England during the time Bill was in France.

Notice that both (35a) and (35b) are systematically ambiguous between the reading on which the events of the first clause occurred dur the entire time that the events of the second clause occurred and the reading on which the first clause occurred only some of the time that the second clause occurred. This semantic parallel adds weight to the syntactic claim that while-clauses have the same privileges of occurrence as certain NPs.

The fact that while-clauses pronominalize like simple time adverbials is illustrated by (36).

36. a. The symphony played during the afternoon, and the debating team practiced then too.

b. The symphony played while the fire raged, and the debating team practiced then too.[8]

Sentences (37) illustrate that nothing can be moved out of a while-clause.

37. a. *John helped fight the fire which the symphony played during which raged.

b. *John helped fight the fire which the symphony played while raged.

The claim that there is an identity condition between the antecedent NP and an NP in the embedded clause underlying a while-clause rests on Geis's analysis of tense harmony. Three hypotheses must be accepted for his argument to work:

38. a. Time adverbials have temporal reference.

b. This temporal reference is expressed as a syntactic or semantic feature.

39. There exists a rule which guarantees that the auxiliary of any clause containing a time adverbial is compatible with the value of the temporal reference feature of that adverbial.

40. The temporal reference feature is involved in the identity condition in relativization.

Hypotheses (38a) and (39) are motivated independently of while-clauses by sentences such as (41), (42), and (43).

41. a. George arrived yesterday.

b. *George arrived tomorrow.

42. a. *George arrives yesterday.

b. George arrives tomorrow.

43. a. *George will arrive yesterday.

b. George will arrive tomorrow.

Hypothesis (38b) is really just the explicit statement of the formal mechanism which is needed to capture these facts. The feature necessary to account for (41) to (43) is [± past]. The most natural way to capture the constraint that the auxiliary of a clause must be compatible with the time adverbial is in semantic terms. Statement (44) is a first approximation of the constraint stated as an interpretive rule.

44. Let A be a set representing the time reference of the auxiliary, and let B be a set representing the time reference of any explicit temporal adverb, then the time reference of the sentence is the intersection of A and B.

Stated as a constraint on the generation of a sentence, (44) would become (45).

45. Let A and B be defined as in (44), then the sentence is blocked if the intersection of A and B is empty.

In the (a) sentences of (41) to (43) the set B corresponding to the adverbial is constrained to be [+ past], so (41a) is not blocked. In (42) and (43), the auxiliaries are [- past] so that set A is constrained to be [- past]. As a result (42a) and (43a) are ill-formed. Conversely, the adverb in the (b) sentences of (41) to (43) is marked [- past], and only (41b) is unacceptable.

Tense harmony occurs with while-clauses as well as simple time adverbs.

46. a. Mary will dry while Sue washes.

b. Mary dried while Sue washed.

c. *Mary will dry while Sue washed.

d. *Mary dried while Sue washes.

By allowing the identity constraint on relative clauses to apply between an antecedent adverbial phrase and the embedded while-clause, the explanation for the tense harmony phenomenon suggested above can be extended to while-clauses without adding any additional mechanism to the grammar.

Parallel arguments to the ones presented above for while-clauses can be presented for when-clauses to show that they are adjoined to an antecedent NP and meet an identity condition (Geis, 1970, Chapter 3). In addition it is possible to show for when-clauses that a movement rule is involved in their formation. Notice that in (47) when can refer either to the time of the telling or to the time of the leaving, while in (48) when can refer only to the time of the telling.[9]

47. John arrived when Harry told Mary that she should leave.

48. John arrived when Harry told Mary about his desire that she should leave.

The only difference between (47) and (48) is that the leave-clause is part of a complex NP in (48) but not in (47). By invoking the Complex NP Constraint (Ross, 1967), it is possible to account for the lack of

ambiguity of (48). The Complex NP Constraint, however, only applies if we are willing to posit a rule that moves when to the position preceding Harry.[10] The movement rule can apply freely to the two structures underlying (63), one of which begins with when attached to the clause containing leave. In the case of sentences like (48), when cannot be moved out of the clause containing leave because that clause has a lexical head noun and the Complex NP Constraint applies. Thus it is reasonable to assume that when-clauses have deletable antecedents, satisfy an identity condition, and undergo a movement rule. In other words, they are relative clauses. Furthermore, it is clear that if we analyze when-clauses as relative clauses, no new movement rule would have to be created to move when to the front of its clause. Wh-Preposing will be able to apply.

The analysis of while-clauses, however, does not parallel that of when-clauses at this point. As Geis noticed, there is no difference in the number of readings available for sentences (49) and (50).

49. Mary was miserable while she doubted that John would work all day.

50. Mary was miserable while she doubted the claim that John would work all day.

Hence, there is no way to utilize the Complex NP Constraint to argue that a movement rule occurs in the derivation of while-clauses. Geis offers two analyses to account for sentences like (49) and (50). The first is to place an ad hoc restriction on the transformation that

derives while from throughout which (or some similar phrase) such that the rule can apply only if this phrase is contained in the simplex sentence which is the sister of the antecedent NP. Geis's alternative solution is to claim 'that while modifies the whole subordinate clause.' That is that (49) has 'essentially the same underlying structure' as (51), with (51) being more basic.

51. Mary was miserable while her doubt that John would work all day lasted.

This suggestion is supported by Geis's argument that while-clauses contain underlying durative adverbials which are either lost or converted into while during the course of the derivation. The argument proceeds as follows: 1) Last cannot occur (outside of while-clauses) without a durative adverbial, 2) Last can occur in a while-clause without a durative adverbial, 3) Last cannot occur in a while-clause with a durative adverbial, 4) Only one durative adverbial can occur per clause, 5) Hence, 'the only possible durative in a non-complex while-clause is lost or converted into while.' The first three steps in this argument are justified by sentences such as (52), (53) and (54).

52. a. *The demonstration lasted.

b. The demonstration lasted for ten minutes.

c. The demonstration lasted throughout the week.

53. The President conferred with his advisors while the threat lasted.

54. *The President conferred with his advisors while the

threat lasted throughout the week.

That only one durative adverbial can occur per clause can be illustrated by sentences such as (55).

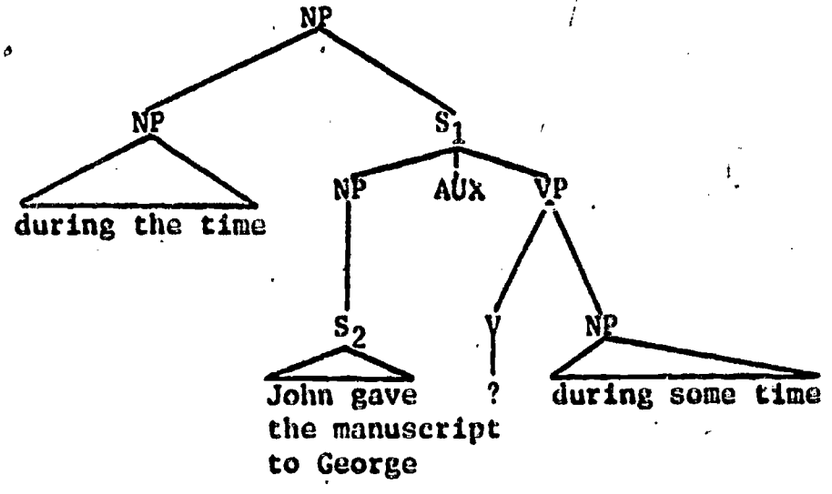
55. *The shortage lasted for ten minutes throughout the week.

Apparent counterexamples such as (56) are obviously instances in which the second durative clause modifies the first.

56. The drought lasted for three months during the summer.

Although Geis generates the durative adverbial of <u>while</u>-clauses in a sentence higher than the surface <u>while</u>-clauses (S_2 in (57)), he presents no argument in favor of this structure.

57.



Presumably, his motivation is similar to that of J. Geis (1970), who, as was noted above, argues that all prepositional phrases originate in higher sentences.

Given structures such as (57), the only mechanisms which need to be added to the grammar to account for <u>while</u>-clauses are three transformations: 1) a rule of Antecedent Deletion, 2) a rule to convert phrases like <u>during some time</u> of (57) to <u>while</u>, and 3) a rule to delete the verb indicated by a question mark.[11]

Geis argues that the rule of Antecedent Deletion is also needed to account for sentences such as (58) to (60).

58. Mary knows where Bill lives.

59. Mary came when Bill whistled.

60. Mary accepted what Bill bought her.

Geis's formulation of the rule, (61), also accounts for the fact that sentences such as (62) are ungrammatical in modern English.

61. Antecedent Deletion (Obligatory)

$$\text{S.D. } X \quad \left[_{NP} \begin{bmatrix}+\text{pro}\\-\text{human}\end{bmatrix}\right] \quad \left[_{S} \begin{bmatrix}+\text{pro}\\-\text{WH}\end{bmatrix}\right] \quad Y$$

$$\begin{array}{llll} 1 & 2 & 3 & 4 \\ \text{S.C. } 1 & \emptyset & 3 & 4 \end{array}$$

62. *Who steals my purse steals trash.

Geis's reason for having Antecedent Deletion delete pronouns is that it allows a unified explanation of the non-occurrence of sentences (63) and (64).

63. a. *I solved the problem how you did.

b. *I left why you did.

64. a. *I solved the problem in the way you did and Harry solved it $\left\{\begin{array}{l}\text{in } \left\{\begin{array}{l}\text{it}\\\text{that}\end{array}\right\}\\\text{thus}\end{array}\right\}$ too

b. *I left for the reason that you left and Harry left $\left\{\begin{array}{l}\text{for } \left\{\begin{array}{l}\text{it}\\\text{that}\end{array}\right\}\\?\end{array}\right\}$ too.

The sentences in (63) cannot be derived because, as (64) shows, there

are no pronouns corresponding to prepositional phrases containing way or reason. The reason for making Antecedent Deletion obligatory is the non-occurrence of the sentences in (65).[12]

65. a. *Mary knows there where Bill lives.

b. *Mary came then when Bill whistled.

c. *Mary accepted { it / that } what Bill brought her.

d. *Mary looked the other way then while John gave the manuscript to George.

Geis has noted that Antecedent Deletion must be last cyclic and follow Wh-Movement in order to avoid generating sentences such as (66).

66. (=Geis's (13)) *Who did Harry tell me that John stood where Bill hit?

Since it has been demonstrated that Pronominalization cannot be a transformational rule (Bach 1969), it will be assumed that pronouns are generated directly in the base. This being the case, it is necessary to provide some means to distinguish instances of then which occur in and for when-clauses from those which occur in and for while-clauses.[13] Since both when and while can introduce durative clauses, it is not feasible to distinguish them on the basis of some such feature as [± extension], which Geis uses to distinguish instantive from durative uses of when-clauses. The most promising analysis would seem to be one that makes use of the unique features of (57). There is no nominalized construction with when in which a form of the verb last can appear. Thus the analogue of (51) is unacceptable.

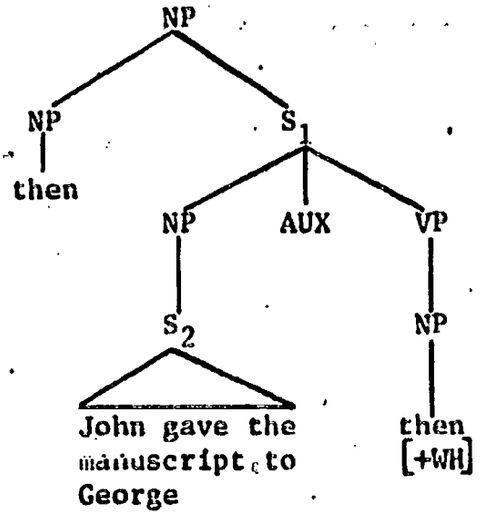
67. *Mary was miserable when her doubt that John would work

all day lasted.

These facts suggest that when-clauses are derived from structures analogous to (57) but with S_1 generated as a copular sentence instead of a verbal sentence. Thus the deep structure for the when-clause of (68) would contain (69).

68. Mary was looking out of the window when John gave George the manuscript.

69.



The critical portion of the WH-Word Formation rule can now be formulated as (70).

70. WH-Word Formation (Obligatory)

S.D. X then Y
[+WH]

1 2 3

S.C. (a) If 1 = X + last

2 while
[+WH]

(b) Otherwise

2 when
[+WH]

This rule must apply before WH-Movement has a chance to prepose the form marked [+WH], otherwise there would be no way to block sentences such as (67).

The rule which deletes the last found in the underlying structure of while-clauses does not constitute a case of nonrecoverable deletion, since the existence of the form while in the sentence indicates that this verb was originally present. By postulating the rule in the form of (71) we can account for the fact that it does not apply when S_2 of structures such as (57) is adjoined to a lexical head noun (see sentence 51).[14]

71. Last Deletion (Obligatory)

S.D.	$[_{NP}$ S]	AUX	last
	1	2	3
S.C.	1	Ø	Ø

By requiring that last be the final element in the simplex sentence containing it, we guarantee that instances of last followed by durative adverbials are not deleted. Last is not deleted from sentences such as

72. How long did it last?

because last is not preceded by AUX in this structure. This formulation intrinsically orders Last Deletion after WH-Movement. Hence in a grammar in which all rules are extrinsically ordered, Last Deletion must be ordered after WH-Movement. In a semiordered grammar, no ordering restrictions need to be placed on Last Deletion

One fact, which is automatically accounted for by the

analysis of while-clauses as relative clauses is that while-clauses share the same possibilities of tenses as relative clauses. In addition to the full set of tensed forms and the inability of both relative clauses and while-clauses to take for-to, POSS-ing, and that complementation both types of clauses undergo the rule that Ross (1972) has named Stuff-ing.[15] This rule distinguishes while-clauses and other relative clauses from surface main clauses to which it can never apply.

Stuff-ing converts some relative clauses to ing-clauses. To use Ross's examples, Stuff-ing is intended to relate sentences (73) and (74).

73. Men who sharpen knives leer at us.

74. Men sharpening knives leer at us.

It could be argued that (74) is derived from (75) by the well-known rule of Whiz Deletion.

75. Men who were sharpening knives leer at us.

This analysis fails, however, because it is possible to find ing attached to stative verbs that occur in relative clauses. Thus, although (76a) and (76b) are unacceptable, (76c) is perfectly good English.

76. a. *Jim is resembling Quang in accent.

b. *Linguists who are resembling Quang should be denied the right to disseminate their smut.

c. Linguists resembling Quang should be denied the right to disseminate their smut.

As Ross indicates, adopting (76b) as the source for (76c) creates

unacceptable difficulties in the analysis of stative verbs.

Ross's original formulation of Stuff-ing is presented in (77).

77. Stuff-ing (Optional)

S.D.	X	$[_{NP}$ NP	$[_{S}$ NP	V	Y$]_{S}]_{NP}$	Z
	1	2	3	4	5	6
	1	2	Ø	4#ing	5	6

In this rule the symbol # is intended to indicate Chomsky adjunction. Although he does not explicitly reformulate the rule, Ross notes (footnote 10) that sentence (78) provides evidence that 'the ing would be inserted without the relative pronoun being deleted. Only later, if the relative pronour constituted the entire subject of a verb followed by ing, would this pronoun be deleted.'[16]

78. These two examples, neither of which proving much in isolation, combine to make an iron-clad argument for Precyclic Buttering.

Although only about half the speakers (8 of 14) polled by the current author accept (78), that is a sufficient proportion to argue that Stuff-ing and Relative Pronoun Deletion should be formulated as separate rules. Speakers who accept (78) require two separate rules. Those who reject (78) differ from those who accept it only in the formulation of the relative pronoun deletion rule. The revised version of Stuff-ing should be formulated as (79).

79. Stuff-ing (Optional)

S.D.	X	$[_{NP}$NP$[_{S}$NP		V	Y$]_{S}]_{NP}$	Z
	1	2	3	4	5	6
S.C.	1	2	3	4#ing	5	6

Notice that adopting structure (57) places the NP dominating while as the second element in this structural description, not the third. For as sentences (80) to (82) indicate the subjects of while-clauses but not the complementizers while can be deleted.

80. a. The people saw Mary while they were enjoying themselves.

    b. While they were enjoying themselves the people saw Mary.

81. a. The people saw Mary while enjoying themselves.

    b. While enjoying themselves, the people saw Mary.

82. a. ?The people saw Mary enjoying themselves.

    b. Enjoying themselves, the people saw Mary.

It is clear that even if (82a) is acceptable it cannot be interpreted as meaning the same thing as sentences (80) and (81). Although (82b) can have the same meaning as (80) and (81) it is clear that it should not be related transformationally to (81a) through (82a). To relate it transformationally to (81b) would require a rule that deletes instances of while only in sentence initial position. It would be more satisfying to seek an analysis of sentences such as (82b) which relates them to absolutive clauses such as (83).

83. Speaking of sad stories, John cut off his little finger yesterday.

Thus it is necessary to prohibit the relative pronoun deletion rule from applying to structures underlying such sentences as (81).

2.3 Oblique Equi-NP Deletion

It is clear that the sentences of (81) with subjectless embedded clauses should be transformationally related to their paraphrases in (80). We will call the rule which transforms the structures underlying the sentences in (80) to the structures underlying (81) by deletion of an embedded subject Oblique Equi-NP Deletion. That this rule contains an identity constraint between the deleted NP and an antecedent NP in the surface main clause can be seen from the fact that the only possible interpretation of (84a) is identical to the interpretation of (84b).

84. a. John frowned ominously while washing dishes.

    b. $John_i$ frowned ominously while he_i was washing dishes. (where $i \neq j$)

Notice that the antecedent NP must command the deleted NP. Sentence (86) can be derived only from the structure underlying sentence (87) and not from the structure underlying sentence (88).

86. John frowned ominously at the thought that Mary would sing while washing dishes.

87. John frowned ominously at the thought that Mary would sing while she was washing dishes.

88. John frowned ominously at the thought that Mary would sing while he was washing dishes.

Similarly (89) can be derived only from the structure underlying (90) and not from the structure underlying (91).

89. The girl who hates John smiled while washing dishes.

90. The girl who hates John smiled while she was washing dishes.

91. The girl who hates John smiled while he was washing dishes.

Some speakers (approximately one-fourth of the over 300 informants asked--see Chapter 3 for details) accept sentence (92b) as well as (92a).

92. a. The people saw Sophia Loren while enjoying themselves.

b. The people saw Sophia Loren while enjoying herself.

For these informants Oblique Equi-NP Deletion must have the structure of (93).

93. Oblique Equi-NP Deletion (Optional)

S.D.	X	NP	Y	$_S$[NP	be	V + ing	Z]
	1	2	3	4	5	6	7
S.C.	1	2	3	Ø	Ø	6	7

CONDITION 1: 2 commands 4.

CONDITION 2: 2 = 4 (i.e., 2 is not featurally distinct from 4)

CONDITION 3: The S = 4+5+6+7 is subjacent to a VP

Condition 3 is intended to limit the rule to adverbial clauses of the same general type as *while*-clauses. On the basis of the claims made by M. Geis (1970) it is reasonable to expect this rule to apply to clauses introduced by *where* as well as the temporal complementizers *when*, *before*, *after*, *since*, *until* and *as*.[17]

Before examining the behavior of Oblique Equi-NP Deletion

in these other contexts, it is necessary to note that, for the majority of speakers who accept (92a) and reject (92b), rule (93) needs to be constrained in such a way that the antecedent NP can only be the subject of its sentence. In order to emphasize the similarities between the grammars for the two different sets of speakers, this constraint will be stated as an additional condition on rule (93).

94. CONDITION 4: 2 is immediately dominated by S.

Returning to the question of which other adverbial clauses can undergo Oblique Equi-NP Deletion consider sentences containing clauses introduced by <u>when</u> and <u>where</u> such as (95) and (96).

95. <u>WHEN</u>

1. When (they were) watching TV, the people could see Mary.
2. The people, when (they were) watching TV, could see Mary.
3. The people could, when (they were) watching TV, see Mary.
4. The people could see Mary when (they were) watching TV.

96. <u>WHERE</u>

1. a. Where they were standing, the people could hear the music.

   b. *Where standing, the people could hear the music.

2. a. The people, where they were standing, could hear the music.

b. *The people, where standing, could hear the music.

3. a. The people could, where they were standing, hear the music.

b. *The people could, where standing, hear the music.

4. a. The people could hear the music where they were standing.

b. *The people could hear the music where standing.

It is clear that both when- and where-clauses can be freely preposed. Only when-clauses, however, can undergo Oblique Equi-NP Deletion. This fact can be accounted for by the fact that Oblique Equi-NP Deletion deletes the tense marker as well as the copula of the embedded clause. This is a non-recoverable deletion in all types of clauses except temporal adverbial relative clauses which, as discussed earlier, M. Geis (1970) has shown are subject to tense harmony restrictions.

The only difference between when-clauses and where-clauses is that when-clauses are relative clauses attached to a head noun TIME and where-clauses are relative clauses attached to a head noun PLACE. As J. Geis (1970) noted, this difference is sufficient to insure tense harmony in the former case and to block it in the later case. Thus by replacing term 5 by AUX in the structural description of (93), Oblique Equi-NP Deletion, we make the fact that when- and while-clauses but not where-clauses undergo the rule an automatic consequence of the facts of tense harmony and a general constraint on the grammar that blocks non-recoverable deletions. The revised version of the rule is given in (97).

97. Oblique Equi-NP Deletion (Optional)

S.D.	X	NP	Y	S[NP	AUX	V + ing	Z]
	1	2	3	4	5	6	7
S.C.	1	2	3	Ø	Ø	6	7

CONDITION 1: 2 commands 4

CONDITION 2: 2 = 4 (i.e., 2 is featurally non-distinct from 4)

CONDITION 3: The S = 4+5+6+7 is subjacent to a VP

CONDITION 4: 2 is immediately dominated by S (some lects only) (i.e., 2 is a subject NP)

Striking confirmation of this analysis can be found in the behavior of until- and since-clauses. Until-clauses which M. Geis has shown are subject to tense harmony behave like when- and while-clauses with respect to Adverb Preposing and Oblique Equi-NP Deletion. Temporal since-clauses which, M. Geis has shown are subject to a tense discord constraint, must undergo Oblique Equi-NP Deletion if they are to be acceptable with participial forms. Causal since-clauses on the other hand are not subject to parallel tense restrictions and cannot undergo Oblique Equi-NP Deletion.[13]

98. UNTIL

1. Until (they were) actually rubbing elbows, the waiters could not see each other.
2. The waiters, until (they were) actually rubbing elbows, could not see each other.
3. The waiters could not, until (they were) actually

rubbing elbows, see each other.

4. The waiters could not see each other until (they were) actually rubbing elbows.

99. SINCE (temporal)

1. a. *Since they were { paying their bills / watching TV }, the people { could call / called } Mary.

b. Since { paying their bills / watching TV }, the people { could call / called } Mary.

c. ?Since they { paid their bills / watched TV }, the people { could call / called } Mary.

2. a. The people, since they were { paying their bills / watching TV }, { could call / called } Mary.

b. The people, since { paying their bills / watching TV }, { could call / called } Mary.

c. ?The people, since they { paid their bills / watched TV }, { could call / called } Mary.

3. a. *The people could, since they were { paying their bills / watching TV }, call Mary.

b. The people could, since { paying their bills / watching TV } ,

call Mary.

c. ?The people could, since they { paid their bills / watched TV } ,

call Mary.

4. a. *The people { could call / called } Mary since they were

{ paying their bills / watching TV } .

b. The people { could call / called } Mary since

{ paying their bills / watching TV } .

c. ?The people { could call / called } Mary since they

{ paid their bills / watched TV } .

100. SINCE (causal)

The (a) and (c) sentences of (99) are acceptable, but the (b) sentences are not.

Sentences containing clauses introduced by before and after behave the same way as the other temporal adverbial relative clauses (except since) discussed above. The reasons are the same if M. Geis's analysis of these clauses is adopted.

101. BEFORE

1. Before (they are) letting passengers board, the airlines are conducting security checks.

2. The airlines, before (they are) letting passengers

board, are conducting security checks.

3. The airlines are, before (they are) letting passengers board, conducting security checks.

4. The airlines are conducting security checks before (they are) letting passengers board.

102. AFTER

1. After (they are) conducting security checks, the the airlines are letting passengers board.

2. The airlines, after (they are) conducting security checks, are letting passengers board.

3. The airlines are, after (they are) conducting security checks, letting passengers board.

4. The airlines are letting passengers board after (they are) conducting security checks.

M. Geis analyses clauses introduced by before and after as relative clauses attached to the head noun TIME which is contained in a prepositional phrase introduced by one of the prepositions before or after. Geis also shows that before and after clauses exhibit tense harmony.

As (103) illustrates, although as clauses are semantically very similar to while-clauses they differ from all of the adverbial relative clauses discussed above in not allowing Oblique Equi-NP Deletion. They do, however, undergo Adverb Preposing.

103. AS

1. a. As they were { paying their bill / watching TV }, the

people could see Mary.

b. *As { paying their bill / watching TV }, the people could see Mary.

2. a. The people, as they were { paying their bill / watching TV }, could see Mary.

b. *The people, as { paying their bill / watching TV }, could see Mary.

3. a. The people could, as they were { paying their bill / watching TV }, see Mary.

b. *The people could, as { paying their bill / watching TV }, see Mary.

4. a. The people could see Mary as they were { paying their bill / watching TV }.

b. *The people could see Mary as { paying their bill / watching TV }.

An explanation for this phenomenon is undoubtedly connected with the fact that where while-clauses define a frame in which the action of the main clause they modify occurs, as-clauses define a time span that is coextensive with the action of their main clauses.

Oblique Equi-NP Deletion is a distinct rule from 'true' Equi-NP Deletion. True Equi is a governed rule. Some verbs require that its structural description be met.

104. a. John tried to buy a camera.

b. *John tried for { himself / Mary } to buy a camera.

Other verbs require that true Equi apply obligatorily if its structural description is met.

105. a. John wanted to buy a camera.

b. John wanted { *himself / Mary } to buy a camera.

Still other verbs block Equi from applying at all.

106. a. *John let buy a camera.

b. John let { himself / Mary } buy a camera.

Oblique Equi-NP Deletion, on the other hand can optionally apply with any main verb.

107. John tried to buy a camera while (he was) visiting Japan.

108. John wanted Mary to have the house painted while (he was) visiting Japan.

109. John let Mary stay with her cousins while (he was) visiting Japan.

The reduced forms of (107) through (109) are, of course, ambiguous as to whether the while-clause modifies the first or second verb. Only the readings on which the while clauses modify the first verb--tried, wanted or let--illustrate the difference between ordinary Equi-NP Deletion and Oblique Equi-NP Deletion. The relevant readings may be easier for some speakers to observe when the while-clauses are preposed as in (110) through (112).

110. While (he was) visiting Japan, John tried to buy a camera.

111. While (he was) visiting Japan, John wanted Mary to have the house painted.

112. While (he was) visiting Japan, John let Mary stay with her cousins.

Additional evidence for the claim that Oblique Equi-NP Deletion is distinct from ordinary Equi-NP Deletion stems from the fact that although the possible antecedent noun phrase for ordinary Equi is the same for all speakers for any given verb, this is not true for Oblique Equi. As is shown in Chapter 3, some speakers treat only derived subject NP's as potential antecedents when they apply Oblique Equi while other speakers allow both derived and underlying subject NP's to be antecedents and still others allow any subject or object NP's to be antecedents. It seems most improbable that a combined deletion rule could be motivated that was both plausible and formulated in such a way that the portion corresponding to ordinary Equi-NP Deletion was held constant across the population of speakers while the portion corresponding to Oblique-Equi-NP Deletion varied from speaker to speaker.

A third reason for keeping Oblique Equi-NP Deletion distinct from ordinary Equi-NP Deletion is that only Oblique Equi requires the deletion of an AUX as well as an NP. The arguments given above that this deletion of AUX is constrained by a recoverability of deletion restriction provide evidence that this deletion process is part of Oblique Equi, for it is clear that Oblique Equi can apply only when this restriction is satisfied.

2.4 The External Structure of While-Clauses

Two main alternative analyses are available for explaining the deep structure source of while-clauses in particular and adverbial clauses in general. The first of these alternatives, which will be referred to as the lower-S analysis, argues that adverbial clauses occur in deep structure more or less where they are found in surface structure. The second approach, which will be referred to as the higher-S analysis, argues that adverbial clauses of the type under consideration originate in sentences higher than the surface main clauses in deep structure while the higher-S analysis argues that the surface main clauses are embedded in their adverbial clauses in deep structure.

If we take into account the possibilities of extrinsically ordering the version of rule (97) containing all four constraints

1) before Passive,

2) after Passive,

or allowing it to be unordered with respect to Passive, then the lower-S and higher-S analyses can be shown to predict the occurrence of different English lects. The differences between these different lects can be represented as differences in patterns of acceptability judgments to the sentences of (92) and their Passive counterparts, given below as (113).

113. a. The people saw Sophia Loren while enjoying themselves.

b. Sophia Loren was seen by the people while enjoying herself.

c. Sophia Loren was seen by the people while enjoying themselves.

d. The people saw Sophia Loren while enjoying herself.

In sentences (a) and (b) the subject of the while-clause has been deleted under identity with the surface subject of the main clause. In sentences (c) and (d) the subject of the while-clause has been deleted under identity with the surface object of the main clause.[19] In sentences (a) and (c) the antecedent noun phrase is the logical subject, while in sentences (b) and (d) it is the logical object.

Grammars containing the less constrained version of rule (97) predict that all four sentences of (113) will be judged acceptable regardless of the analysis of the ordering relation between Oblique Equi-NP Deletion and Passive and regardless of whether the higher-S analysis or the lower-S analysis is chosen. Grammars containing the more constrained version of (97) can be divided into three groups depending on whether they allow application of Oblique Equi-NP Deletion (1) before Passive, (2) after Passive, or (3) both before and after Passive. Type 1 grammars predict that sentences (113a) and (113c) will be acceptable while (113b) and (113d) will be unacceptable. Type 2 grammars predict that sentences (113a) and (113b) will be acceptable while (113c) and (113d) will not. Type 3 grammars predict that sentences (113a), (113b) and (113c) will be acceptable while only (113d) will not be acceptable.

If we adopt Koutsoudas's (1972) suggestion that no rules be extrinsically ordered with respect to each other, then under both the higher-S analysis and the lower-S analysis only Type 3 grammars can be constructed. If we assume that all rules are extrinsically ordered, then the higher-S analysis allows Type 2 and Type 3 grammars to be constructed. Type 1 grammars could not occur because Passive will always have a chance to apply to the surface main clause before the cycle on which the surface main clause and the adverbial clause are both within the scope of Oblique Equi-NP Deletion. Similarly, if we assume that some but not all rules of a grammar are extrinsically ordered with respect to each other (the semiordering hypothesis), the higher-S analysis allows only Type 2 and Type 3 grammars. Under the assumption that all rules are extrinsically ordered, the lower-S analysis allows the construction of Type 1 and Type 2 grammars but not Type 3 grammars. Under the semiordering hypothesis, the lower-S analysis allows all three types of grammars to be constructed. These intersecting sets of predictions are summarized in (114).

114. Grammars allowed under the higher-S and lower-S analyses under three different ordering hypotheses.

HYPOTHESIS	ANALYSIS		GRAMMAR
	Higher-S	Lower-S	
All rules extrinsically ordered	No	Yes	Type 1
	Yes	Yes	Type 2
	Yes	No	Type 3
Some rules extrinsically ordered	No	Yes	Type 1
	Yes	Yes	Type 2
	Yes	Yes	Type 3
No rules extrinsically ordered	No	No	Type 1
	No	No	Type 2
	Yes	Yes	Type 3

It is clear that empirical evidence bearing on the existence or non-existence of grammars of Types 1, 2 and 3 would be extremely helpful in choosing among the available theoretical options.

NOTES TO CHAPTER 2

1. Counterexamples to this generalization are produced by heavy NP-Shift as illustrated by (a).

   a. The people saw, while they were watching TV, the man who tried to sell them the Brooklyn Bridge three different times.

   Heavy NP-Shift also moves heavy NP's around lexical adverbs such as yesterday.

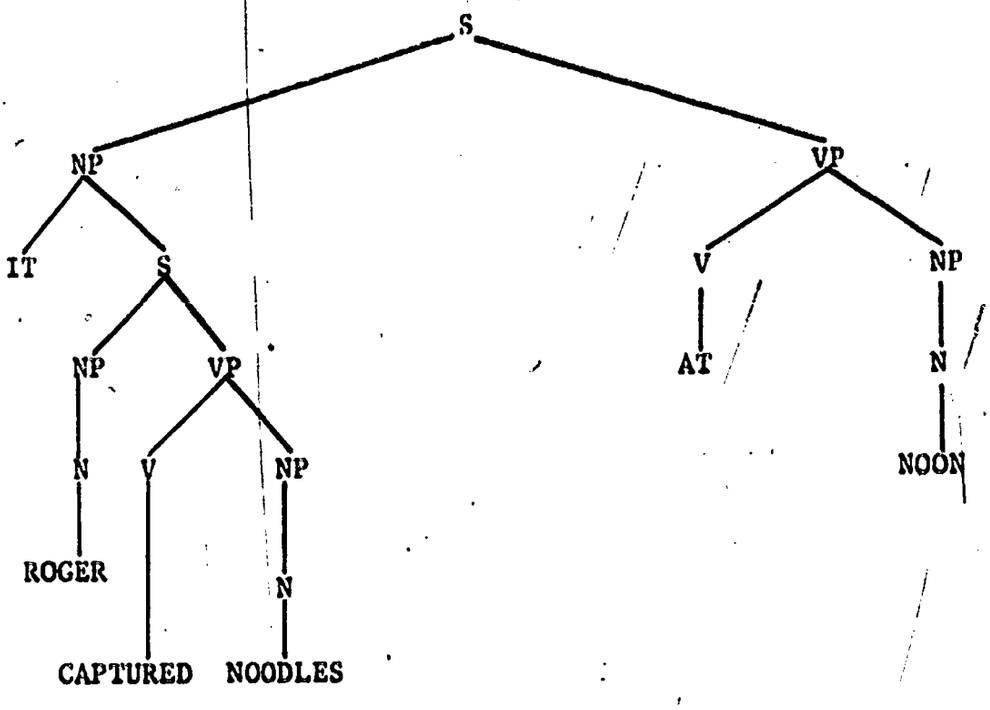
   b. The people saw yesterday the man who tried to sell them the Brooklyn Bridge three different times.

   This exception does not affect the following arguments which assume that sentences such as (3d) should not be freely generated.

2. Independent evidence is presented in the Appendix that copulas are dominated by AUX rather than by VP. Emonds (1970) uses the fact that some adverbs occur after the copula and auxiliary have and before the verb to argue that these two items are modals dominated by AUX at the time that his AUX Movement rule applies.

3. J. Geis, after considering and rejecting various alternatives, suggests deep structures like her (70) for sentences containing temporal and locative prepositional phrases. A transformational rule eventually Chomsky adjoins the preposition to its object.

Geis's 70.



Geis uses capital letters prior to lexical insertion to indicate the feature bundles that will eventually be replaced by lexical items or deleted by transformations.

4. In light of the existence of sentences such as (a) it is reasonable to assume that in sentence (30) do so replaces the while-clause and not just the VP of the while-clause.

   a. Zorro continued to duel while he protected a bruised arm and his opponent fought while doing so too.

5. When pied-piping occurs, only one of the right-most constituent NP's need be identical to the noun phrase to which the clause is adjoined, not the entire preposed phrase.

6. Notice that once the claim that a covert antecedent exists for while-clauses has been accepted, it is necessary to posit an Antecedent Deletion rule to account for its absence in surface structure. Alternatively, it could be argued that the heads of relative clauses are created by a rule of Head Raising which is blocked in just those cases in which Antecedent Deletion would apply. Bresnan (1973b) presents evidence against such a rule.

7. Note that last allows time adverbs but does not allow frame time adverbials. It is the only known verb with this property. Sentences (34) and (35) are Geis's (3), (4), (6), and (7).

8. When-clauses also pronominalize with then, and in fact have an analysis similar to that of while-clauses, although somewhat simpler. See M. Geis's Chapter 3 for details.

9. These sentences are M. Geis's (36) and (37).

10. Work by Bresnan (forthcomming) and Perlmutter (1972) suggests that Ross's variable rule constraints, in particular the Complex NP Constraint apply to deletion rules rather than movement rules. What is referred to in this discussion as movement might be better analyzed as copying followed by deletion.

11. The reason for positing a verbal sentence in these structures as opposed to a copular sentence is to maintain the parallel with nominalized sentences such as (51).

12. Geis never indicates whether or not Antecedent Deletion is obligatory. He does note (pp. 63-64) one special case when the rule is apparently optional: where-clauses in which the speaker is pointing to the referent of there at the time of the utterance, as in 'John stood there where Bonnie and Clyde got gunned down.'

13. Geis never adopts a rule of while or when formation although he does suggest (p. 95) a rule of while formation that he labels as ad hoc. His rule has nothing in common with the rule suggested here.

14. Last Deletion was never formalized by Geis.

15. It might be argued that the underlined clause in (a) constitutes an example of a for-to complement in a relative clause.

    a. The man (for you) to speak to is John.

    If this argument is accepted, while-clauses can still be analyzed as a special type of relative clause that is more restrictive than other types as to the allowable tenses and complement types.

16. Ross goes on to suggest that the relative pronoun deletion rule might be extended 'by making it obligatory before any nonfinite verb form, thus accounting for the contrast between a razor with which to shave, and a razor (*which) to shave with.'

17. M. Geis (1970) discusses each of these complementizers except as. All of those which he treats are analyzed as relative clauses. Whereas sentences containing while have underlying structures involving

structures underlying strings like 'throughout the time throughout which S lasted,' sentences containing when are associated with underlying strings like 'at/during the time at/during which S.' Similarly where-clauses are associated with underlying structures related to strings like 'at the place at which S.' Before- and after-clauses are treated as relative clauses attached to prepositional phrases introduced by the prepositions before and after, respectively: 'before the time at which S,' and 'after the time at which S.' The structures for since- and until-clauses are somewhat more complicated. Geis argues that the underlying structure of since-clauses is like that underlying the string 'for all of the time that ends at the time at which S.'

As-clauses should presumably have structures very similar to those of while-clauses. The only differences would have to be motivated by the fact that the action of main clauses associated with while-clauses must occur within the period specified by the while-clause, while the action of main clauses associated with as-clauses must occur throughout the period specified by the as-clause. This result could be obtained in an ad hoc manner by simply inventing an abstract verb similar to last which has the meaning 'transpired simultaneously with.' For the purposes of the following discussion, all that need be assumed is that as-clauses are also derived from underlying structures containing relative clauses.

18. M. Geis (1970) argues that until and (temporal) since-clauses are relative clauses adjoined to an adverbial like for all of the time and that they are subject to his Antecedent Deletion rule. In addition he claims that until-clauses never occur embedded in sentences with present perfect main verbs while temporal since-clauses always do. Although the sentences in (99) cast some doubt on the second part of this claim, a related fact that Geis noticed remains valid: Temporal since-clauses are subject to tense discord, that is if the tense of the main clause is present, then the tense in the since-clause must be past. Geis's example (133) is repeated below:

a. i. *John has been living here (ever) since his father dies.

ii. John has been living here (ever) since his father died.

The reduced forms in example (99) suggest that Geis's restriction should be modified to simply exclude present tenses from since-clauses. This modified restriction would allow us to account for the speakers who accept the (c) sentences in (99) which would otherwise be totally unaccounted for.

Whatever the proper statement of this restriction is for temporal since-clauses, causal since-clauses (not discussed by the Geis's) are clearly not subject to it.

b. i. George came since Mary paid his way.

ii. George came since Mary is here too.

c. i. George cooks fish since Mary told him to.

ii. George cooks fish since Mary eats it.

It seems likely that a detailed formulation of the restrictions on the tenses of temporal since-clauses will sufficiently constrain the choice of AUX so that Oblique Equi-NP Deletion can be considered a recoverable deletion in this case as well as the cases governed by a tense harmony restriction.

19. People in (113c) is, strictly speaking, not the object of the main clause. The critical point is that it and Sophia Loren in (113d) are not surface subjects.

CHAPTER 3: THE ACCEPTABILITY JUDGMENT EVIDENCE

3.0 Introduction

In order to determine which patterns of acceptance and rejection of the sentences in (1) actually occur three small studies were conducted.

1. a. The people saw Sophia Loren while enjoying themselves.
   b. Sophia Loren was seen by the people while enjoying herself.
   c. Sophia Loren was seen by the people while enjoying themselves.
   d. The people saw Sophia Loren while enjoying herself.

Despite the fact that the three groups were tested under differing conditions, highly similar results were obtained from each. These results strongly suggest that besides the all acceptance pattern, only patterns of Types 2 and 3 (as defined in Chapter 2) actually occur. In order to correct certain methodological shortcomings in the first three studies, a fourth study was conducted using 272 informants. This fourth study confirms the existence of pattern Types 2 and 3 and raises grave doubts about the existence of pattern Type 1.

3.1 Preliminary Experiments

3.1.1 Study 1: Individual Oral Presentation

Twenty-six graduate students and faculty members at the University of Texas at Austin were asked to give acceptability judgments to sentences similar to examples (1a-d). The judgments were collected on an individual basis with the interviewer recording the responses. The sentences were repeated if requested.

3.1.2 Results of Study 1

As can be seen from Table 1, the informants can be divided into three main groups. The first seven informants accepted all four of the sentences, providing no information on the order of rule application. Informants 8 through 13 rejected the sentence corresponding to (1d) and accepted the remaining sentences. These speakers must allow Passive to apply either before or after Oblique Equi-NP Deletion (Type 3). Informants 14 through 24, however, accept only the sentences corresponding to (1a) and (1c). To account for these speakers, it is necessary to posit grammars having Passive extrinsically ordered before Oblique Equi-NP Deletion (Type 2).[1]

Under the lower-S analysis, insisting that all grammatical rules be extrinsically ordered with respect to each other would lead to an ordering paradox in the construction of grammars for informants 8 through 13. This paradox does not occur under the higher-S analysis, because even if Passive is extrinsically ordered after Oblique Equi-NP Deletion, it has a chance to apply to the surface main clause on the first cycle. It is not until the second cycle that Adverb Lowering creates a structure that satisfies the structural description of Oblique Equi-NP Deletion. If a solution can be found for the problems created by the violation of strict cyclicity,[2] Passive would also have a chance to apply on the second cycle, after the application of Oblique Equi-NP Deletion.

Under both the lower S analysis and the higher-S analysis, the insistence that no rules may be extrinsically ordered with respect to each other would lead to a complication in the description of the grammars for

Table 1

Study 1: Responses to Sentences With While-Clauses

Informant Number	Sentence a	b	c	d		
1.	+	+	+	+	N	1 constraint: a. NP = NP_{matrix}
2.	+	+	+	+	L	
3.	+	+	+	+	N	
4.	+	+	+	+	N	
5.	+	+	+	+	N	
6.	+	+	+	+	N	
7.	+	+	+	+	N	
8.	+	+	+	-	N	2 constraints: a. NP = NP_{matrix}; b. NP_{matrix} = subject
9.	+	+	+	-	N	
10.	+	+	+	-	N	
11.	+	+	+	-	L	
12.	+	+	+	-	L	
13.	+	+	+	-	L	
14.	+	+	-	-	N	3 constraints: a. NP = NP_{matrix}; b. NP_{matrix} = subject; c. Passive precedes Equi-NP Deletion
15.	+	+	-	-	L	
16.	+	+	-	-	N	
17.	+	+	-	-	L	
18.	+	+	-	-	N	
19.	+	+	-	-	N	
20.	+	+		-	N	
21.	+	+	-	-	N	
22.	+	+	-	-	N	
23.	+	+	-	-	L	
24.	+	+	-	-	L	
25.		+	-	+	N	3 constraints: a. NP = NP matrix; b. NP matrix = object; c. Passive precedes Deletion
26.	+	-	-	-	N*	

Key to sentences:

a. We saw Sophia Loren while enjoying ourselves

b. Sophia Loren was seen by us while enjoying herself

c. Sophia Loren was seen by us while enjoying ourselves

d. We saw Sophia Loren while enjoying herself

N = Nativelike

L = Less than nativelike

*No theoretically motivated explanation

informants 14 through 24. The adoption of the semiordering hypothesis that grammars can contain both extrinsically ordered and unordered rules,[3] allows us to account for both of these groups of informants (Types 2 and3) as well as to describe the difference between them in a natural way. The grammars for informants 1 through 24 all contain an Oblique Equi-NP Deletion rule which applies to while-clauses with the constraint that the deleted NP be identical to some NP in the matrix sentence.[4] The grammars of informants 8 through 13 have an additional constraint on Oblique Equi-NP Deletion that requires the matrix NP to be the subject of the matrix sentence at the time that deletion occurs. The grammars of informants 14 through 24 share these two constraints on Oblique Equi-NP Deletion and add a third: Oblique Equi-NP Deletion cannot apply before Passive.

3.1.3 Study 2: Group Oral Presentation

A second study was designed to replicate and extend the results of Study 1. In addition to sentences using saw as the main verb and enjoying as the verb in the embedded sentence, a set of sentences was constructed using watched and amusing. Study 1 did not address the question of the relation between preposed and postposed while-clauses in sentences such as those in examples (2) and (3).

2. While amusing ourselves, we watched Lyndon Johnson.

3. We watched Lyndon Johnson while amusing ourselves.

If Oblique Equi-NP Deletion applies before Adverb Preposing we would expect the constraints on deletion in preposed and postposed adverbial clauses to be identical for a given individual. Note that Oblique Equi-NP Deletion can be intrinsically ordered before Adverb Preposing if we adopt a structural

index utilizing the left-to-right ordering of the symbols as in (4).[5]

4. $[_S$ X NP_1 X $[_S$ <u>while</u> NP_1 X] X]

1 2 3 4 5 6 7

There is no need to assume extrinsic ordering, for if Adverb Preposing were to apply before Oblique Equi-NP Deletion, the conditions for the application of the deletion rule would be destroyed. If, on the other hand, a rule were adopted which uses some other technique for identifying the identical NP in the matrix sentence that is not dependent on the left-to-right ordering of the string (e.g., a distance principle), it would be possible to create a situation in which Oblique Equi-NP Deletion applies after Adverb Preposing and the appropriate 'model' NP which governs deletion varies. For speakers who have Oblique Equi-NP Deletion extrinsically ordered after Passive, we would expect to see reversals in the acceptability judgments between sentences with preposed and sentences with postposed <u>while</u>-clauses.

The sentences in Study 2 (see Tables 2 and 3) were presented to a group of 20 psychology students at the University of Texas who had had no linguistic training. The interviewer read the sentences twice unless requested to repeat, and the informants recorded their own judgments on answer sheets. Four responses were allowed: (1) Unacceptable, (2) Uncertain, but probably unacceptable, (3) Uncertain, but probably acceptable, (4) Acceptable. Responses 1 and 2 were scored minus (-) and responses 3 and 4 were scored plus (+).

3.1.4 Results of Study 2

The response of 13 of the 20 informants to the sentences involving saw showed the same three patterns as the majority of the informants from Study 1 (see Table 2). There is no apparent theoretically motivated explanation for the responses of 6 of the remaining seven informants.

As can be seen from Table 3, 16 of the 20 informants exhibited the same three main patterns (the all acceptance pattern, pattern 2 and pattern 3) for sentences involving watched and amusing as were found for sentences with saw and enjoying. One of the remaining informants (17) seems to have the same constraints on Oblique Equi-NP Deletion as the other speakers who accept only two sentences except that Oblique Equi-NP Deletion is ordered before Passive. The patterns of the remaining three informants have no theoretically motivated explanation.

Somewhat surprisingly, the constraints on the sentences with watched seem to be more stringent than those on the sentences with saw (see Table 4). In particular, eight speakers who accepted the active saw-sentence with deletion under object identity (1d) rejected the corresponding sentence with watched. It cannot be clear what should be used to account for this difference until a replication has been completed using a variety of lexical items.

As can be seen from Table 5, the same three basic patterns of acceptability exist for preposed while-clauses as for postposed clauses. This is particularly interesting in light of the fact that sentences with preposed adverbials and deletion under nonsubject identity (such as (5)) are explicitly rejected by the school grammars, while the corresponding sentences

Table 2

Study 2: While-clauses with saw as the matrix verb

Informant Number	Sentence a	b	c	d	
1.	+	+	+	+	1 constraint: a. NP = NP matrix
2.	+	+	+	+	
3.	+	+	+	+	
4.	+	+	+	+	
5.	+	+	+	+	
6.	+	+	+	+	
7.	+	+	-	+	No theoretically motivated explanation
8.	+	+	-	+	
9.	+	+	-	+	
10.	+	+	+	-	2 constraints: a. NP = NP matrix; b. NP_{matrix} = subject
11.	+	+	+	-	
12.	+	+	+	-	
13.	+	+	+	-	
14.	+	+	-	-	3 constraints: a/b. NP = NP_{matrix} = subject; c. Passive precedes Deletion
15.	+	+	-	-	
16.	+	+	-	-	
17.	+	-	-	+	
18.	-	+	-	-	No theoretically motivated explanation
19.	+	-	-	-	
20.	+	-	-	-	

Key to sentences:

a. We saw Sophia Loren while enjoying ourselves
b. Sophia Loren was seen by us while enjoying herself
c. Sophia Loren was seen by us while enjoying ourselves
d. We saw Sophia Loren while enjoying herself

Table 3.

Study 2: While-clauses with watched as the matrix verb

Informant Number	Sentence a	b	c	d	
1.	+	+	+	+	1 constraint: a. NP = NP_{matrix}
3.	+	+	+	+	
4.	+	+	+	-	2 constraints: a. NP = NP_{matrix}; b. NP_{matrix} = subject
13.	+	+	+	-	
5.	+	+	+	-	
14.	+	+	+	-	
2.	+	+	+	-	
20.	+	+	+	-	
17.	+	-	+	-	3 constraints (?): a. NP = NP_{matrix}; b. NP_{matrix} = subject; c. Deletion precedes Passive
11.	-	+	+	-	*
12.	+	+	-	-	3 constraints: a. NP = NP_{matrix}; b. NP_{matrix} = subject; c. Passive precedes Deletion
9.	+	+	-	-	
19.	+	+	-	-	
15.	+	+	-	-	
7.	+	+	-	-	
16.	+	+	-	-	
18.	+	+	-	-	
6.	+	+	-	-	
10.	-	+	-	-	*
8.	-	+	-	-	

Key to sentences:

a. We watched Lyndon Johnson while amusing ourselves
b. Lyndon Johnson was watched by us while amusing himself
c. Lyndon Johnson was watched by us while amusing ourselves
d. We watched Lyndon Johnson while amusing himself

*No theoretically motivated explanation

Table 4

Comparison of sentences with saw and watched as main verb

	Saw				Watched			
	Subject Agreement		Non-subject Agreement		Subject Agreement		Non-subject Agreement	
	Active	Passive	Passive	Active	Active	Passive	Passive	Active
Informant Number								
1.	+	+	+	+	+	+	+	+
2.	+	+	+	+	+	+	+	-
3.	+	+	+	+	+	+	+	-
5.	+	+	+	+	+	+	+	-
4.	+	+	+	+	+	+	-	-
6.	+	+	+	+	+	+	-	-
7.	+	+	-	+	+	+	+	+
8.	+	+	-	+	-	+	-	-
9.	+	+	-	+	+	+	-	-
10.	+	+	+	-	+	+	-	-
11.	+	+	+	-	+	+	-	-
12.	+	+	+	-	+	-	+	-
13.	+	+	+	-	-	+	-	-
15.	+	+	-	-	+	+	+	-
14.	+	+	-	-	+	+	-	-
16.	+	+	-	-	+	+	-	-
17.	+	-	-	+	+	+	-	-
18.	-	+	-	-	+	+	+	-
19.	+	-	-	-	-	+	+	-
20.	+	-	-	-	+	+	+	-
Number of Acceptances	19	17	10	10	17	19	10	2

saw \ watched	+	-
+	39	17
-	9	15

Table 5

Comparison of preposed and postposed while-clauses

	Preposed Reflexives				Postposed Reflexives			
	Subject Agreement		Non-subject Agreement		Subject agreement		Non-subject Agreement	
	active	passive	passive	active	active	passive	passive	active
Informant Number								
1.	+	+	+	+	+	+	+	+
3.	+	+	+	+	+	+	-	-
7.	+	+	+	+	+	+	-	-
6.	+	+	+	+	+	+	+	-
4.	+	+	+	-	+	+	+	-
8.	+	+	+	-	+	+	-	-
13.	+	+	+	-	+	+	+	-
17.	+	+	+	-	+	+	-	-
18.	+	+	+	-	+	-	+	-
2.	+	+	+	-	+	+	+	-
9.	+	+	+	-	-	+	-	-
12.	+	+	-	+	+	+	+	+
15.	+	+	-	+	-	+	+	-
5.	+	+	-	-	+	+	+	-
11.	+	+	-	-	+	+	-	-
16.	+	+	-	-	+	+	-	-
19.	+	+	-	-	-	+	-	-
10.	+	+	-	-	+	+	-	-
14.	+	-	-	-	+	+	-	-
20.	+	-	-	-	+	+	+	-
Number of acceptances	20	18	11	6	17	19	10	2

Preposed \ Postposed	+	-
+	42	13
-	6	19

with postposed adverbials (such as (6)) are generally ignored by these grammars.

5. While amusing ourselves, Lyndon Johnson was watched by us.

6. Lyndon Johnson was watched by us while amusing ourselves.

Informants who do not give identical responses to corresponding sentences with preposed and postposed clauses show a marked preference for the sentences with preposed clauses (13 to 6). This preference may be related to the existence of such participial absolutives as (7).

7. Crossing the street, John tripped over his shoelaces.

It may well be that whatever mechanisms speakers use to process utterances like (7) are available for processing preposed but not postposed adverbial clauses.

Although there is considerably more variation in the data from Study 2 than was found in Study 1, the same three basic patterns of responses occur in both studies. The patterns for preposed and postposed sentences are highly similar, lending support to the hypothesis that Oblique Equi-NP Deletion is not extrinsically ordered with respect to Adverb Preposing but is intrinsically ordered before it. An unexplained difference was found between the responses to sentences involving saw and those involving watched. Deletion under object identity with an active matrix sentence was more readily accepted in the former than in the latter. Preposed while-clauses are somewhat more acceptable than postposed while-clauses.

3.1.5 Study 3: Individual Written Presentation

Study 3 was designed to replicate the results of Studies 1 and 2 with respect to postposed while-clauses but in a written mode of presentation.

The four sentences of interest were randomly embedded among 67 other sentences dealing with relative clauses.[6] These sentences were presented to the informants in writing along with the instructions:

> The following sentences vary in acceptability for different speakers of English. Please indicate your initial reactions according to the scale on the next page. Please do not: (1) Change your first reaction, (2) Discuss these with anyone else, (3) Reread sentences which you have already marked.

The materials were returned at the informants' convenience. Of the 27 graduate students and faculty from various educational institutions in the Los Angeles area who completed the questionnaire, 21 had a significant amount of linguistic training. The response possibilities and interpretations were the same as those in Study 2.

3.1.6 Results of Study 3

Nineteen of the informants responded with patterns identical to the three main patterns found in the previous studies (see Table 6). Informant twelve's pattern (Type 1) could be accounted for under the lower-S analysis by a grammar having three constraints on Oblique Equi-NP Deletion:

1. The deleted NP must be identical to some NP in the matrix sentence.
2. The antecedent NP in the matrix sentence must be the subject of its sentence.
3. Oblique Equi-NP Deletion is extrinsically ordered before Passive.

Informant twenty-three's responses suggest a grammar like the above with the second constraint changed so that the model NP is the object

f the matrix sentence. The remaining 6 informants' responses have no theoretically plausible explanation. These results correspond closely to the results of the other two studies.

It is worth noting that only one of the six non-linguists in Study 3 responded with one of the three main patterns found in all the studies. This fact suggests that at least in the written mode, linguists and non-linguists are approaching the task of assigning acceptability judgments differently. This difference can probably be attributed to the difficulty of making the nature of the acceptability judgment clear to a naive informant. In the case of the orally presented materials, informants were permitted to ask for clarification of the instructions.[7] This opportunity was generally not available to the informants who responded to the written sentences.

3.2 Discussion of Preliminary Experiments

Of the 16 logically possible patterns of responses to the four paradigm sentences with postposed while-clauses, 12 appear in the data from the three studies (see Table 7). Over three quarters of the response patterns, however, were concentrated in the three most frequent patterns: The all acceptance pattern, pattern Type 2, and pattern Type 3 (as defined in Chapter 2). These three patterns can all be accounted for in theoretically natural and interesting ways. Two of the remaining patterns (representing 4% of the total) can also be described in grammatically meaningful terms. It is not clear, however, that it is necessary or reasonable to do so in light of the small number of informants exhibiting the patterns. The remaining seven patterns make up 17% of the data, but have no theoretically

Table 6

Study 3: Responses to Sentences With While-clauses

	Sentences						
	a	b	c	d			
1.	+	+	+	+	N	1	Constraint a. NP = NP_{matrix}
2.	+	+	+	+	L		
3.	+	+	+	+	L		
4.	+	+	+	+	L		
5.	+	+	-	+	L	*	
6.	+	+	+	-	L	2	Constraints a. NP = NP_{matrix} b. NP_{matrix} = subject
7.	+	+	+	-	L		
8.	+	+	+	-	L		
9.	+	+	+	-	L		
10.	+	+	+	-	L		
11.	-	+	+	-	N	*	
12.	+	-	+	-	N	3	Constraints, including Deletion ordered before Passive
13.	+	+	-	-	L	3	Constraints, including Deletion ordered after Passive
14.	+	+	-	-	L		
15.	+	+	-	-	L		
16.	+	+	-	-	L		
17.	+	+	-	-	L		
18.	+	+	-	-	L		
19.	+	+	-	-	L		
20.	+	+	-	-	L		
21.	+	+	-	-	L		
22.	+	+	-	-	L		
23.	-	+	-	+	N	3	Constraints, including Deletion ordered before Passive and NP_{matrix} = object
24.	+	-	-	-	L	*	
25.	-	+	-	-	L		
26.	-	-	+	-	N		
27.	-	-	-	-	N		

Key to sentences:

a. The people saw Sophia Loren while enjoying themselves.
b. Sophia Loren was seen by the people while enjoying herself.
c. Judy was seen by the people while enjoying themselves.
d. The people saw Karen while enjoying herself

Note:
L = Linguist
N = Non-Linguist

* = Theoretically motivated explanation

reasonable explanations which can be associated with them. The existence of these patterns is probably due to the relatively high level of 'noise' which is associated with collecting acceptability judgments. This noise has at least three sources: (1) The difficulty of disambiguating the question 'Is this sentence acceptable to you?', (2) The indeterminacy of introspection, and (3) the increasing difficulty of making consistent judgments after 10 to 20 sentences have been processed.

Two main differences between linguists and non-linguists are apparent from a comparison of their responses to the postposed while-clauses:

1. The linguists tended to have more constraints on the Oblique Equi-NP Deletion rule than the non-linguists,

and

2. The linguists' responses tended to be cleaner; i.e., fewer non-explainable patterns appeared in the data from linguists.

3.3 Study 4: Group Written Presentation

Studies 1 to 3 clearly indicate a lack of homogeneity among English speaking informants in judging the acceptability of sentences like (1a-d). Nevertheless, several methodological questions can be raised about these studies which call their specific results into question. Within each study, all informants saw or heard the sentences in the same order. Since it is quite possible that in the context of an earlier sentence a later sentence may appear to be better or worse than if it were presented in isolation, these studies may be biased by the presentation orders chosen. In addition, no controls were placed on the length of time each informant had in which to indicate his judgment for each item. Under these conditions

Table 7

Comparison of Response Patterns of Linguists and Non-linguists in Studies 1, 2, and 3

	Sentence Type				% of Informants Responding with pattern		
	a	b	c	d	(n = 44) Non-linguists	(n = 29) Linguists	(n = 73) Total
Major Patterns: All Acceptance	+	+	+	+	30	14	23
Type 3	+	+	+	-	16	28	21
Type 2	+	+	-	-	23	48	33
Minor patterns having theoretical explanations: Type 1	+	-	+	-	2	0	1
Surface Object Agreement	-	+	-	+	5	0	3
	+	+	-	+			
	-	+	+	-	2	0	1
	+	-	-	+	2	0	1
Patterns without theoretically motivated explanations	+	-	-	-	7	3	5
	-	+	-	-	2	3	3
	-	-	+	-	2	0	1
	-	-	-	-	2	0	1

Key to sentences:

a. We saw Sophia Loren while enjoying ourselves
b. Sophia Loren was seen by us while enjoying herself
c. 1. Sophia Loren was seen by us while enjoying ourselves
   2. Judy was seen by the people while enjoying themselves*
d. 1. We saw Sophia Loren while enjoying herself
   2. The people saw Karen while enjoying herself*

*Sentences 3b and 4b were used in Study 3.

it is possible that some of the informants had time to intellectualize their responses. Such an explanation could conceivably account for the differences found between the responses of linguists and nonlinguists. Furthermore, because repetitions were available on request, sentences were not all heard or read the same number of times.

For reasons similar to these Greenbaum (1973) decided to conduct a study using the sentences from Study 3, in which all possible orders of presentation were used and in which informants were allowed only 5 seconds to respond to each item. Greenbaum found that sentences are more likely to be rejected if presented in first position than if presented in any other position. Although he does not report his results in terms of the frequency of occurrence of the different response patterns, the most frequent pattern which he observed--and the only pattern which can be shown to occur at above chance rates--is the all reject pattern. It seems likely that this surprising result is due to the imposition of the 5 second per response limitation.

In order to resolve the question of which patterns do in fact occur at above chance frequencies, and in order to determine the effect of a 5 second limitation per response, a fourth study was conducted. The sentences used were identical to (1a-d) except that Sophia Loren was changed to Mary. Each sentence and the four point scale appeared on a separate page, and the pages were stapled into a booklet. Approximately half (127) of the informants were told to turn the page every 5 seconds, while the remainder (145) were told to work as quickly as possible without skipping any sentences and that they would have to report the amount of time used at the end of the test. Examples of the instruction sheets for the timed and self-paced groups are given in (8) and (9).

8.

Please do not turn the page until you are asked to.

On each of the pages that follow you will find a sentence. We would like to have your immediate reaction to the acceptability of the sentences. On each page you should check the box with the number that indicates your reaction. The scale of possible reactions given below is repeated on each page.

4	Acceptable
3	Uncertain, but probably acceptable
2	Uncertain, but probably unacceptable
1	Unacceptable

In order to make sure that you give your first reaction, will you please follow the spoken instructions. They will tell you when to turn each page.

9.

Please do not turn the page until you are asked to.

On each of the pages that follow you will find a sentence. We would like to have your immediate reaction to the acceptability of the sentences. On each page you should check the box with the number that indicates your reaction. The scale of possible reactions given below is repeated on each page.

4	Acceptable
3	Uncertain, but probably acceptable
2	Uncertain, but probably unacceptable
1	Unacceptable

In order to make sure that you give your first reaction, please work as quickly as you can without skipping any sentences. Do not go back to sentences after you have reacted to them. Do not change a response once you have made it. A place is provided at the end of this booklet for you to note the time that is written on the blackboard when you finish.

These instructions were read to the informants after the test booklets had been distributed.[8] Example (10) shows a typical page of the test booklets.

10.

The people saw Mary while enjoying themselves.

4	Acceptable
3	Uncertain, but probably acceptable
2	Uncertain, but probably unacceptable
1	Unacceptable

The informants are all native speakers of English. All are undergraduates drawn from English, psychology, anthropology and beginning linguistics courses at the University of California at Los Angeles, the University of Southern California, and California State College at Dominguez Hills.

Since four items can be arranged in 24 distinct linear sequences, 24 presentation sequences were used. These were divided into six Latin squares containing four sequences each. Large, multi-section classes were used in the experiment. Sections were randomly assigned different Latin squares with the constraint that corresponding timed and self-paced booklets from a given Latin square were distributed to different sections of the same class.[9] At least three informants received each presentation sequence under each condition.

3.4 Results of Study 4

3.4.1 Analysis of Variance

Table 8 is the source table for the analysis of variance procedure used. No significant difference was found among the six Latin squares, although the order effect noted by Greenbaum was confirmed ($p<.01$, $F=17.70$, $df=3,672$). As can be seen from Table 9, the earlier a sentence is presented the more likely it is to be rejected. The only exception is that the

Source	df	M.S.	F
Between Informants	271		
Condition (C)	1	2.01945	1.15
Latin Square (L)	5	3.40871	1.94
Sequences (S/L)	18	1.87044	1.06
C x L	5	3.97238	2.26
C x S/L	18	1.36334	<1
Informants (I/CSL)	224	1.75892	
Within Informants	816		
Position (P)	3	15.57524	17.70**
Sentence (T)	3	81.87306	93.05**
L x P	15	0.64966	<1
L x T	15	0.72583	<1
Residual (R/L)	36	0.99523	1.13
C x P	3	0.58741	<1
C x T	3	7.49948	8.52**
C x L x P	15	0.42120	<1
C x L x T	15	0.64372	<1
C x R/L	36	1.30934	1.49*
P x I/SL	672	0.87985	

*p<.05

**p<.01

Table 8: Analysis of variance for acceptability judgment data from Southern California college students.

self-paced informants accepted the third sentence presented slightly more frequently than they accepted the fourth sentence presented to them. This difference is, however, not statistically significant.

	Position				
	1	2	3	4	Average
Self-paced	2.14	2.58	2.73	2.69	2.53
Timed	2.20	2.55	2.75	2.87	2.59
Average	2.17	2.57	2.74	2.78	2.56

Table 9: Mean responses by position and condition.

Comparison of the average means for each pair of positions (Table 10) demonstrates that the scores for sentences presented first are significantly lower than the scores for sentences presented in each of the other positions ($p<.001$). Scores for positions other than the first were not significantly different from each other.[10]

	Position			
	1	2	3	4
1	-	22.11**	44.89**	51.44**
2		-	3.99*	6.09*
3			-	.22

Table 10: F-values and significance levels (df=1,672) for differences between average means for each pair of positions using Winer's (1962:378) technique for unweighted means.

*$p<.05$, **$p<.001$

As expected, the responses to the four sentences (1a-d) were significantly different ($p<.01$, $F=93.05$, $df=3,672$). The average means for each sentence are presented in Table 11.

	Sentence				
	a	b	c	d	Average
Self-paced	3.27	3.07	2.05	1.75	2.53
Timed	2.97	2.99	2.27	2.25	2.62
Average	3.12	3.03	2.16	2.00	2.58

Table 11: Mean responses by sentence and condition.

Examination of Table 11 shows that the responses of the self-paced group are more extreme than the responses of the timed group. Thus the self-paced group rated sentences (1a) and (1b) higher than the timed group did. Similarly, the self-paced group also rated sentences (1c) and (1d) lower than the timed group did. This effect appears in Table 4 as a significant condition by sentence interaction ($p<.01$, $F=8.52$, $df=3,672$). There exists a straightforward explanation for this interaction: Since the timed informants were rushed in making their judgments, they indicated uncertainty by assigning ratings of 2 (uncertain, but probably acceptable) and 3 (uncertain, but probably unacceptable) instead of 1 (acceptable) and 4 (unacceptable). This interpretation is supported by the fact that the differences in the average means for the two groups is not significant.

Pairwise comparisions of the sentence means for each group are given in Tables 12 and 13. Neither group treated sentences (1a) and (1b)

significantly differently. Both groups treated (1a) and (1b) significantly differently from sentences (1c) and (1d). The only distinction between the groups is that the timed group did not treat sentences (1c) and (1d) differentially while the self-paced group showed a strong tendency to do so.[11]

	Sentences			
	a	b	c	d
a	-	2.96	110.14**	170.97**
b		-	76.99**	128.94**
c			-	6.66*

Table 12: Self-paced group: F-values and significance levels (df=1,672) for differences between means for each pair of sentences based on Winer's (1962) technique for unweighted means (*p<.01, ** p<.001).

	Sentences			
	a	b	c	d
a	-	.03	33.77**	35.72**
b		-	35.72**	37.74**
c			-	.03

Table 13: Timed group: F-values and significance levels (df=1,672) for differences between means for each pair of sentences based on Winer's (1962) technique for unweighted means (**p<.001).

The responses of the two groups were compared on a sentence by sentence basis. The only sentence that the two groups treated significantly differently is (1d), with p<.001 (F=13.82, df=1,896), thus confirming

the tendency noted in Table 8 for the self-paced group to treat sentences (1c) and (1d) distinctively. Taken together these facts show that the effect of imposing a five second time limit on the responses is to decrease the differentiation among the four sentences. Not surprisingly, the less time informants have to make a decision, the less certain they are about the decision.

A related effect of the time limit, not apparent from the analysis of variance, is an increase in the number of omitted responses. In the self-paced condition all informants responded to all the test sentences. In the timed condition 11 of the 127 informants (8.5%) did not respond to one or more of the sentences. As the failure to answer in five seconds can be taken as an indication of indecision, nonresponses were given the value of 2.5 on the four point scale for purposes of the analysis of variance. Since there is no way of knowing what their 'true' response patterns might be, these 11 informants were omitted from the Scheffé-type analysis of the pattern types discussed below.

Contrary to Greenbaum's findings, but consistent with Studies 1-3, the three most frequent patterns in both the timed and the self-paced cases were the all acceptance pattern and patterns of Type 2 and Type 3. Somewhat surprising in light of Greenbaum's results is the high correlation (Spearman rank order correlation $r_s = .7975$, $t = 4.95$, $df = 14$, $p < .001$) between the timed and self-paced informants on the relative popularity of the patterns. Table 14 juxtaposes the rank-orderings of the 16 patterns under the two conditions.

The data from Table 14 are graphed in Figure 1. This graph shows both the similarity between the popularity of the patterns and the effect of imposing a five second time limit. There are relatively fewer timed informants in the most frequent patterns and more timed informants scattered throughout the nine least frequent patterns. This decrease in pattern differentiation is another detrimental effect resulting from the imposition of a five second time limit.

3.4.2 Scheffé-Type Multinomial Comparison

In order to answer the question of which patterns occur at above chance frequencies a Scheffé-type multinomial comparison was applied to the relative frequencies of occurrence of the patterns. The relative frequency of occurrence of each pattern was compared to that of each of the other patterns. If the three most frequent patterns really represent the only three available grammars, they should be significantly more frequent than each of the others. In addition the 13 less frequent patterns should appear only as a result of measurement error--such extraneous factors as slips of the pencil, the misreading of a sentence, or the misinterpretation of the instructions. Thus, given that no systematic biases were introduced by the test or the test administrators, these patterns should occur randomly and with approximately equal frequency.

The results of the comparison of the three most frequent patterns to the remaining 13, presented in Tables 15 and 16, are consistent with these expectations. For the self-paced informants the two most frequent patterns (Types 2 and 3) are distinct from all but the four most frequent of the remaining patterns. The all acceptance pattern is significantly

Sentence a b c d	Rank Order Over-all	Self-paced	Timed	Percent of Informants Exhibiting Pattern Self-paced (N=145)	Timed (N=116)
+ + - -	1	1	1	24.14	17.24
+ + + -	2	2	3	18.62	11.21
+ + + +	3	4	2	9.66	13.79
+ - - -	4.5	4	7	9.66	7.76
- - - -	4.5	6	6	8.97	8.62
+ + - +	6	7	4.5	6.90	9.48
- + - -	7	4	8	9.66	5.17
- + - +	8	11.5	4.5	1.38	9.48
+ - + -	9	8	9.5	3.45	4.31
+ - + +	10	11.5	9.5	1.38	4.31
- + + -	11	9	13	2.76	1.72
+ - - +	12.5	10	13	2.07	1.72
- + + +	12.5	13.5	11	0.69	3.45
- - + -	14	15.5	13	0.00	1.72
- - - +	15	13.5	15.5	0.69	0.00
- - + +	16	15.5	15.5	0.00	0.00

Table 14: Rank order and percent of informants exhibiting each pattern.

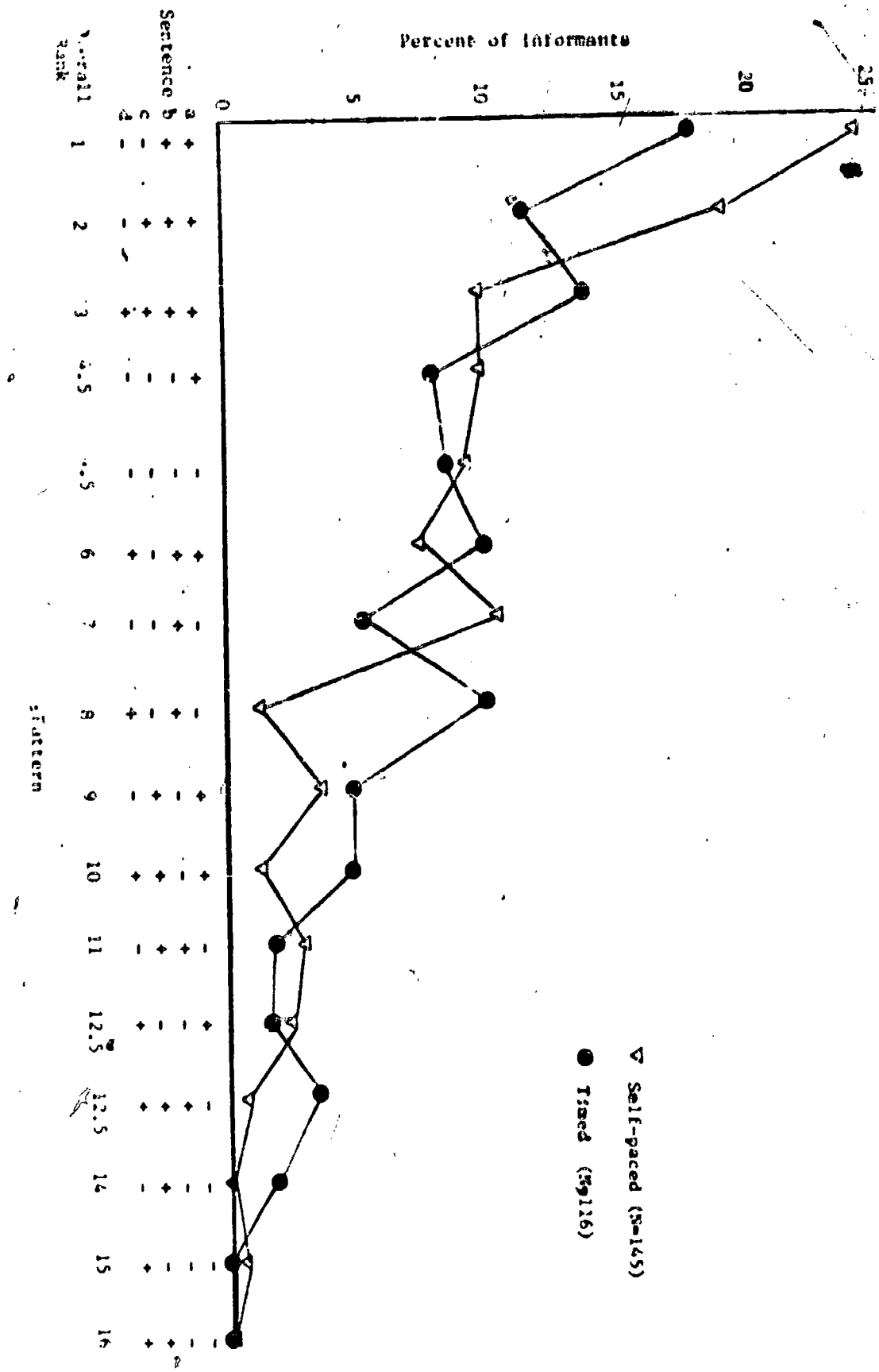


Figure 1: Pattern popularities by condition

different only from the non-occurring patterns. The Type 1 pattern was exhibited by 3.45 percent of the informants and was significantly less frequent than patterns of Type 2 or Type 3 ($p<.01$).

The timed group, on the other hand, exhibited fewer significant differences than the self-paced group. Only seven (as opposed to 18) comparisons were significant at $p<.01$. The overall results of the timed group were, however, similar to those of the self-paced group. The Type 1 pattern was exhibited by 4.13 percent of the informants. In both groups, this was the eighth most popular pattern of the 16 logically possible patterns. In neither the self-paced nor the timed conditions, were significant differences detected among the occurring less frequent patterns (rank orders 4.5 - 15).[12]

Since the patterns with overall rank 4.5 - 7 are not significantly different from the three most frequent patterns, it is necessary to examine them more closely to see if they may be of some linguistic interest.[13] None of these patterns appears to be explainable in theoretically interesting terms. Furthermore, there is no reason to believe that native speakers of English judge either sentence (1a) or (1b) to be unacceptable for any linguistically interesting reasons. Since one or both of these sentences was rejected by the informants exhibiting the patterns +---, -+--, ---, and -+-+, it is likely that these people interpreted 'acceptable' in some way different from that which was intended. Such an explanation does not help with the pattern ++-+, which remains completely unaccounted for.

The failure of the all acceptance pattern (++++) to differ significantly from the less frequently occurring patterns does not

Predicted Pattern	++--	+++-	+++
Proportion of Informants	.2414	.1862	.0966
Nonpredicted Pattern	**Proportion of Informants**		
+---	.0966	.1448	.0896	.0000
-+--	.0966	.1448	.0896	.0000
----	.0897	.1517	.0965	.0069
+-+-	.0690	.1724	.1172	.0276
+-+-	.0345	.2069**	.1517**	.0621
-++-	.0276	.2138**	.1586**	.0690
+--+	.0207	.2207**	.1655**	.0759
+-++	.0138	.2276**	.1724**	.0828
-+-+	.0138	.2276**	.1724**	.0828
-+++	.0069	.2345**	.1793**	.0897
---+	.0069	.2345**	.1793**	.0897
--+-	.0000	.2414**	.1862**	.0966*
--++	.0000	.2414**	.1862**	.0966*
Number of significant differences at p<.01		9	9	0

Table 15: Self-paced group: differences between proportions of predicted and nonpredicted patterns (N=145).

*p<.05 that one or more of the differences was declared significant by chance.

**p<.01 that one or more of the differences was declared significant by chance.

	Predicted Pattern	++--	+++-	+++-
	Proportion of Informants	.1724	.1379	.1121
Nonpredicted Pattern	Proportion of Informants			
++-+	.0948	.0776	.0431	.0173
-+-+	.0948	.0776	.0431	.0173
----	.0862	.0862	.0517	.0259
+---	.0776	.0948	.0603	.0345
-+--	.0517	.1207	.0862	.0604
+-+-	.0431	.1293	.0948	.0690
+-++	.0431	.1293	.0948	.0690
-+++	.0345	.1379*	.1034	.0776
-++-	.0172	.1552**	.1207*	.0949
+--+	.0172	.1552**	.1207*	.0949
--+-	.0172	.1552**	.1207*	.0949
---+	.0000	.1724**	.1379**	.1121*
--+i	.0000	.1724**	.1379**	.1121*
Number of significant differences at p<.01		5	2	0

Table 16: Timed group: differences between proportions of predicted and nonpredicted patterns (N=116).

* p < .05 that one or more of the differences was declared significant by chance.

** p < .01 that one or more of the differences was declared significant by chance.

necessarily show that it does not exist as a viable lect. Combining the data from the self-paced and the timed groups allows the multinomial test to detect six differences between this pattern and the 13 least frequent patterns at $p<.01$ and seven differences at $p<.05$. This suggests that the pattern is infrequent enough to require between 300 and 400 informants to be detected as significant by this statistical test. For practical purposes it is fair to assume that the pattern exists.

To summarize the results of the statistical tests employed, the existence of the basic patterns found in Studies 1-3 has been confirmed. The order effect noted by Greenbaum (1973) has also been confirmed, suggesting that linguists should take special precautions to insure that a tendency by naive informants to reject early sentences not lead to inaccurate analyses of the data. The results of the analysis of variance procedures strongly suggest that if first reactions are desired to sentences with the complexity of (1), it is better to tell informants to work as quickly as possible than it is to force them to respond at five second intervals. The Scheffé-type multinomial analysis provides a foundation for the argument that the all acceptance pattern and patterns of Types 2 and 3 deserve linguistic explanation while the remaining response patterns, in particular the Type 1 pattern, do not.

NOTES TO CHAPTER 3

1. These conclusions are, of course, necessary only if a transformational analysis is adopted. Arguments for rejecting an interpretive analysis of these data are presented in Chapter 4.

2. The problem amounts to finding a way to prevent Passive from applying to the output of rules that have applied after it on the first cycle.

3. The semiordering hypothesis can be conceived of as claiming that no pair of rules is extrinsically ordered unless one (or both) of the rules contains an explicit condition in its structural description requiring that it not apply before or after the other rule.

4. Strictly speaking this constraint is consistent with the current data but is not necessarily entailed by it.

5. Rule (97) in Chapter 2 contains a somewhat more precise formulation of this structural index.

6. Study 3 was embedded in a larger study reported in part by Elliott, Legum, and Thompson (1969).

7. Usually a phrase like 'would you ever say this sentence given the appropriate circumstances' seemed to convey the nature of the task well.

8. In addition the words 'You will have five seconds per sentence,' were added by the test administrator at the end of the instructions

for the timed group. With the exception of this sentence, the timed instructions are identical to those used by Greenbaum.

9. Two large psychology sections at Dominguez Hills were given two Latin squares each: one section was timed and the other self-paced.

10. Although the scores for sentences given in second position were different enough from those of the following sentences to reach probability levels of $p<.05$, this criterion is not stringent enough to be statistically significant because the total number of comparisions must be taken into account. Accepting a significance level of $p<.05$ for any of the six comparisons in Table 6 would allow the probability of one or more of the comparisons being falsely declared significant to be as large as .30, a scientifically unacceptable level. Using a significance level of $p<.001$ for each of the tests insures that the probability of one or more of the comparisons being falsely declared significant does not exceed .006.

11. Since 16 post hoc tests are being made on this set of means (including six tests in Table 8, six tests in Table 9, and four comparisons of the timed versus self-paced groups--one for each sentence) it is necessary that the criterion level for the individual tests be set at $p<.003$ to insure that the chance of one or more of the comparisons being falsely declared significant is less than .05. Thus although the difference between sentences (1c) and (1d) for the self-paced group occurred with probability less than .01, so many tests have been made that even this relatively low probability cannot be accepted

as proof of a difference in the absence of other corroborating evidence such as that discussed below.

12. Although the theoretical foundations for the tests reported in Tables 15 and 16 are complex (for details see Miller, 1966: 215-218) the computations are quite simple. In addition, the assumptions that the Scheffé-type multinomial test places on the data are minimal: the observations are not assumed to be normally distributed and the observations can be qualitative. No order is assumed among the categories. The critical theorems have, however, been proved only for large sample sizes. If a difference between two proportions in Tables 15 and 16 is larger than the value of the associated function calculated from equation (a) then the difference is significant at level α.

$$\text{a.}\quad F(P_i,P_j,N,C,\alpha) = z(\alpha, C).\sqrt{\frac{P_i + P_j - (P_i - P_j)^2}{N}}$$

Where P_i and P_j are the two proportions, N is the number of informants, C is the number of theoretically observable response patterns, and $z(\alpha,C)$ is defined by formula (b).

$$\text{b.}\quad 1 - Q = \frac{1}{\sqrt{2\Pi}} \int_{-\infty}^{z(\alpha,C)} e^{-y^2/2}\, dy$$

where

$$Q = \frac{\alpha}{2\binom{C}{2}}$$

Formula (b) has the form of the normal probability function. Convenient tables for (b) are available in many statistics texts and such standard

works as Pearson and Hartley (1958, Table 4).

13. These four patterns are also not significantly different from any of the less frequently occurring patterns at $p<.05$.

CHAPTER 4: CONCLUSION

In Chapter 2 the rules of Adverb Preposing and Oblique Equi-NP Deletion were motivated to account for the behavior of *while*-clauses and certain related adverbial clauses. No conclusions were reached on the ordering relation between Oblique Equi-NP Deletion and Passive because of the uncertainty about which combination of assumptions should be adopted regarding alternative metatheoretical constraints on the order of rule application (all rules extrinsically ordered, some rules extrinsically ordered, or no rules extrinsically ordered) and whether a lower-S analysis or a higher-S analysis of adverbial clauses should be preferred. Different combinations of answers to the rule ordering question and the surface-like versus abstract source for adverbial clauses were shown to allow the construction of four different sets of grammars. Each grammar makes distinctive predictions about potential responses to requests for acceptability judgments to sentences like (1a-d).

1. a. The people saw Mary while enjoying themselves.
   b. Mary was seen by the people while enjoying herself.
   c. Mary was seen by the people while enjoying themselves.
   d. The people saw Mary while enjoying herself.

In Chapter 3, 345 informants' responses to such requests are reported. These data clearly establish the existence of response patterns of the type predicted by grammars of Types 2 and 3. The fact that only 13 (0.9%) of the informants exhibited the response pattern predicted by grammars of Type 1, provides, in the absence of any contrary data, a strong argument for adopting theoretical positions which prohibit writing grammars of this kind.

Of the alternative analyses discussed in Chapter 2, only a theory allowing a higher-S analysis with either all or some rules extrinsically ordered allows grammars of both Types 2 and 3 while prohibiting grammars of Type 1. Type 2 grammars require that Passive apply before Oblique Equi-NP Deletion. This order of application can be guaranteed either by extrinsically ordering Passive before Oblique Equi-NP Deletion or by invoking a principle such as Chomsky's (1973: p. 243) Strict Cycle Condition to block the application of Passive after the rule of Adverb Lowering has created a structure to which Oblique Equi-NP Deletion can apply.

Under the higher-S analysis, Type 3 grammars can be constructed either by ordering Oblique Equi-NP Deletion before Passive or by allowing the rules to be unordered with respect to each other. Both ordering assumptions allow Passive to apply on the first cycle (the surface main clause cycle) and Oblique Equi-NP Deletion to apply on a following cycle after Adverb Lowering has applied. The only way that Passive can be allowed to apply after Oblique Equi-NP Deletion, as Type 3 grammars require, is to allow Passive a second chance to apply, on the higher cycle. Such a formulation has the serious disadvantage of violating the Strict Cycle Condition. Simply restating the condition in such a way as to allow the reapplication of Passive to the surface main clause after Adverb Lowering has applied is not an acceptable alternative. Such a restatement would also allow Passive to apply after any rule which is extrinsically ordered after Passive. As example (2) illustrates for the case of For-Dative Movement, the mere addition of an adverbial

to an otherwise unacceptable sentence whose derivation violates strict cyclicity does not make the sentence acceptable.[1]

2 a. *John was picked out a tie by Mary.

b. *John was picked out a tie by Mary while she was shopping at Nieman Marcus.

These considerations raise grave doubts as to the tenability of the higher-S analysis.

The lower-S analysis, as formulated in Chapter 2, can produce grammars of Type 2 only if Passive can be extrinsically ordered before Oblique Equi-NP Deletion. It can allow grammars of Type 3 only if Passive and Oblique Equi-NP Deletion are not extrisically ordered with respect to each other. Thus under the lower-S analysis it is necessary to adopt a grammatical theory which allows both extrinsically ordered and unordered rules. Within such a grammatical theory, however, there is no way to prohibit a lower-S analysis of Type 1, which could be constructed by extrinsically ordering Oblique Equi-NP Deletion before Passive.

Under the lower-S analysis there is a straight-forward way to construct both Type 2 and Type 3 grammars using an interpretive rather than a transformational explanation. Such an account would posit an interpretive rule that identifies the subjects of subjectless while-clauses. Under the assumption that interpretive rules apply at the end of each cycle after all transformational rules have applied, Type 2 grammars could be

constructed by allowing the controller NP to be either the surface subject or the agent of the main clause. Type 1 grammars can, however, also be constructed using the interpretive analysis: The controller NP of the interpretation rule would be limited to the agent of the main clause. Thus the interpretive analysis also makes the claim that the nonoccurrence of Type 1 grammars is accidental. The interpretive analysis has the disadvantage of requiring the use of the non-natural class [subject of or agent of]. It does not, on the other hand, force the transformational component of the grammar to contain unordered pairs of rules. The transformational version of the lower-S analysis can also avoid the use of unordered rules by adopting the non-natural class [subject of or agent of] as part of the structural description of the Oblique Equi-NP Deletion rule for Type 3 grammars.

Neither higher-S analyses of the type favored by generative semanticists nor lower-S analyses of the type favored by interpretative semanticists can satisfactorily account for the range of observed lects. Choosing the former requires that an alternative be found to the Strict Cycle Condition, while choosing the latter necessitates the claim that the nonoccurrence of Type 1 grammars is an accidental matter and requires the use of the ad hoc class: [subject of or agent of].

One currently untapped data source that may help to resolve this dilemma is first language acquisition. Since children are exposed to conflicting idiolects, it is possible that the rule of Oblique Equi-NP Deletion undergoes numerous changes during the course of language acquisition. It is conceivable that the bare outlines of the rule, involving deletion under identity, are acquired first and that various

constraints on the application of the rule are learned later. Such constraints could include restrictions on the order of rule application (if a semiordered model is adopted) or the restriction of the antecedent controller NP to some combination of the categories subject or agent of the surface main clause. If child grammars of Type 1 can be found, then the necessity of a lower-S analysis will be shown. If no grammars of Type 1 can be found, the plausibility of lower-S analyses will be diminished.

A second approach that has the potential of proving the existence of Type 1 grammars is to identify informants responding to the sentences of (1) with Type 1 patterns and to analyze their idiolects in greater detail.[2] There is of course no way to prove the nonexistence of a potential lect. For this reason the lower-S analysis cannot in principle be disproved on the basis of questions about the interaction of Oblique Equi-NP Deletion and Passive.

Although no definitive explanation for the behavior of English while-clauses has been provided, it is clear that the simultaneous consideration of several coexistent lects has greatly narrowed the class of grammars that can correctly account for these phenomena. It has been shown, moreover, that neither surfacism nor abstract grammar as currently conceived can satisfactorily account for the data. That the variation found in the acceptability judgment studies is real as opposed to aritfactual is beyond doubt. It is clear that grammatical theory must be shaped so as to allow the construction of grammars for each observable lect. It is equally clear that a grammatical theory

which can account for the differences between the observed lects in a natural way is preferable to one that cannot. Furthermore, a grammatical theory that prohibits the construction of grammars for lects that have not been observed is to be preferred over a grammatical theory that allows such grammars, on the grounds that the former theory is more highly constrained and thus more easily falsified than the latter.

NOTES TO CHAPTER 4

1. For arguments showing that For-Dative Movement applies after Passive see Fillmore (1965).

2. Such an approach was not feasible with the informants in Study 4 who exhibited the Type 1 pattern because their data were collected in such a way as to guarantee their anonymity. The two informants in the earlier studies who have this pattern are no longer accessible.

APPENDIX: SKETCH OF ENGLISH ADVERBS

A.0 Introduction

The traditional definition of adverb is 'a word that modifies a verb, an adjective, or another adverb' (Curme, 1947). Although this definition has some merit, dictionaries and some school grammars have also typically called several other small groups of words adverbs. In general, if a word is not clearly identifiable as a noun, verb, adjective, conjunction, or preposition, it has been fair game as an adverb. Thus, the expletive _there_; the responses _yes_ and _no_; attention signals such as _well_, _oh_, and _now_; interrogative _wh_-words; _not_ as a sentence negator; subordinating conjunctions such as _because_, _although_, _after_, _when_, and _whenever_; and verb particles have all been classed as adverbs at one time or another (Gleason, 1965).

It has been shown elsewhere (Legum, 1968; Fraser, 1965) that verb particles are adjective phrases and prepositions dominated by a category particle. Katz and Postal (1964) have shown that interrogative _wh_-words are pro forms of noun phrases which may reasonably be considered adverbs. The expletive is now believed to have a transformational origin (Jacobs & Rosenbaum, 1968). _Yes_ and _no_ responses and attention signals will be arbitrarily excluded from this study on the grounds that they are intuitively less closely connected to sentences than any of the other categories under discussion. _Not_ is clearly in a class by itself and will also be excluded from direct study. It may, in fact, be reasonable to call some of the subordinating conjunctions adverbs, but we will not pre-judge the question.

Excluding wh-words and subordinating conjunctions, the words which may reasonably be taken to satisfy the traditional definition of adverb fall into three natural classes: words which modify noun phrases, words which modify adjectives, and words which modify verb phrases and sentences.[1] Following Gleason (1965), these classes will be referred to as limiters, intensifiers, and adverbs, respectively.

A.1 Limiters

Only a small number of words seem to be able to modify noun phrases. These include just, only, and merely as in (1) through (6).

1. He gave the job(s) to {just / only / merely} {a boy / the boys}.

2. He gave the job(s) {just / only / merely} to {a boy / the boys}.

3. He gave {just / only / merely} {a boy / the boys} the job(s).

4. He saw {just / only / merely} a boy.

5. {Just / Only / Merely} a boy could do that.

6. He is clearly {just / only / merely} a boy.

Since these words also modify verb phrases, as in (7) and (8), it is appropriate to describe them as phrase modifiers.[2]

7. He {just / only / merely} called you a name, he didn't hit you.

8. {Just / Only / Merely} tell me your desires, and I will see that they are satisfied.

Ability of a word to modify a noun phrase in one of the positions illustrated in (1)-(6) does not guarantee the ability to modify that noun phrase in other sentential positions. For instance, barely and scarcely can replace the limiters in sentences (1), (3), (4), (6), and possibly (5), but not in sentence (2). Since (1) through (3) are all instances of indirect objects, we are lead to the suspicion that these examples represent more than one kind of modification.

Closer examination of sentences (1)-(3) lends support to this hypothesis. Consider in particular the sentences (9a-c).

9. a. He gave the jobs to just a boy.

   b. He gave the jobs just to a boy.

   c. He gave just a boy the jobs.

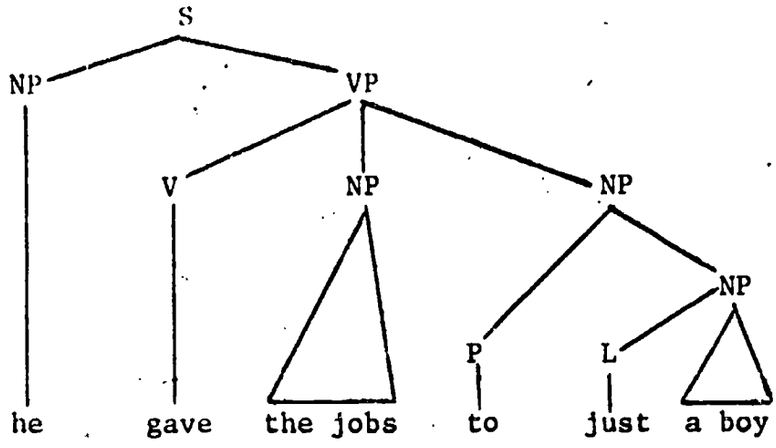
Sentences (9a) and (9c) share the reading (10), while sentences (9b) and (9c) share the reading (11).

10. He gave the jobs to a mere tyke.

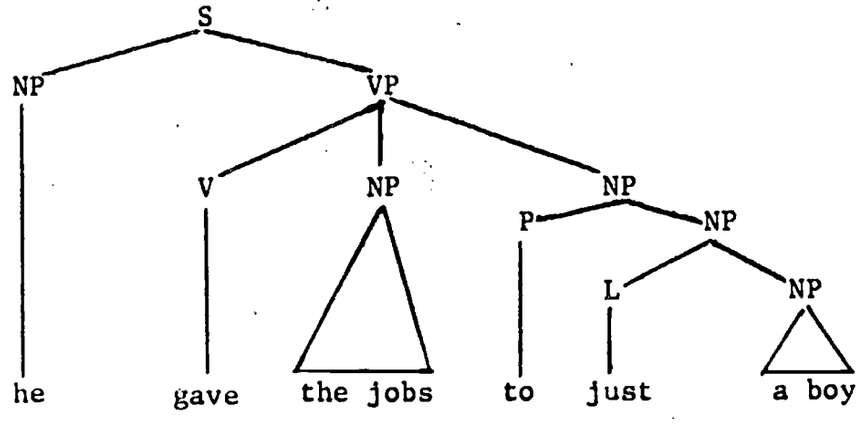
11. He limited his job giving to one boy. (No adults and no girls got jobs.)

Sentence (9a) must have a structure closer to (12) than to (13).

12.



13.



If (13) were the structure of (9a) it should be possible to derive, among others, questions (14) and (15).

14. To just whom did he give the jobs?

15. *Whom did he give the jobs to just?

It is clear, however, that the <u>just</u> in (14) is not the same as the <u>just</u> in (9a), and (15) is not acceptable at all. Similarly, (13) predicts that (16) can be acceptably derived by relativization and (17) by clefting.

16. *The boy whome he gave the jobs to just is a friend of mine.

17. *It was a boy that he gave the jobs to just.

Structure (12), on the other hand, correctly predicts that both (16) and (17) will be ungrammatical (and hence unacceptable).

A problem arises at this point. If (14) can occur at all, why can't (15), (16), and (17)? One possible answer is that the just of (14), which means something like 'precisely' or 'exactly,' is transformationally attached to a noun phrase after Wh-Fronting and Clefting have applied. This explanation has the advantage of prohibiting (18), (19), and (20), if we make the natural assumption that when the object of a preposition is moved stranding the preposition, the NP node dominating the preposition is pruned.

18. *Whom did he give the jobs just to?

19. *The boy whom he gave the jobs just to is a friend of mine.

20. *It was a boy that he gave the jobs just to.

At the same time, this analysis correctly predicts that (21) is acceptable and synonymous with (14).

21. Just whom did he give the jobs to?

Cleft sentences like (22) and (23) are also correctly predicted to be acceptable.

22. It was to just a boy (that) he gave the jobs.

23. It was just a boy (that) he gave the jobs to.

A difficulty arises, however, with relativization. Under this analysis, (24) and (25) should be acceptable, but are not.

24. *The boy just whom he gave the jobs to is a friend of mine.

25. *The boy to just whom he gave the jobs is a friend of mine.

These sentences can be blocked by preventing limiters from being attached to relative wh-forms but not to question forms.[3] This restriction can make use of the distinction between wh-forms which allows some relative wh's to be realized as that: wh-forms which may be realized as that may not undergo limiter attachment.

This analysis correctly predicts that just can be attached to wh-words introducing embedded questions as in (26).

26. I asked just who he saw.

Apparent counterexamples such as (27) can be shown to be embedded questions rather than relative clauses.

27. I know (just) which boy you saw.

Although it is possible to replace the which in (27) by that, the structure is not the same. For instance, in (28) that is a determiner.

28. I know (just) that boy you saw.

Furthermore, 'unreduced' sentences corresponding to (27) do not allow modification by just.

29. a. I know the boy (*just) who you saw.

b. I know the one (*just) who you saw.

Further justification for considering the which of (27) a question form rather than a relative comes from the fact that it is translated as a question word rather than a relativizing word in a number of Indo-European languages (including Icelandic and Hindi) as well as non-Indo-European languages (e.g., Hebrew) which maintain morphological distinctions between relative forms and question forms.[4]

An alternative explanation might claim that the just which appears before question wh-forms as in (14) and (21) is a distinct lexical item from the other instances of just so far discussed. This analysis would rule out (24) and (25) by restricting Just-Attachment to words which have not undergone Wh-Attachment, and would necessitate devising other means of attaching the just of (14) and (21) to question wh's. A distinction would still be required between question and relative wh's. In addition, we would have to set up a form which is closely related in meaning to other homophonous forms and in complementary distribution with them. For these reasons the separate lexical item analysis can be rejected.

Limiter attachment may be similar to the Neg-Postposing rule postulated by Labov (1972:p.191) in that neither rule can attach an item to the subject NP.[5] In the case of Black English, Neg-Copying copies a neg which is attached to a verb phrase onto any noun phrase to the right of the verb. A parallel analysis would account for the strangeness of some limiters (e.g., scarcely) when attached to subject NP's. Under this analysis it would be necessary to assume that some limiters are introduced attached to NP's by the phrase structure rules, while other limiters are introduced attached to VP's or S's and then optionally attached to NP's by limiter attachment.

It might appear that copular sentences would have to be treated as a special case by such a transformation because we can find limiters following the copula but none preceding.

30. He is $\left\{\begin{matrix}\text{just}\\\text{only}\\\text{merely}\end{matrix}\right\}$ a boy.

31. *He {just / only / merely} is a boy.

At first glance it would seem that we need to make limiter attachment obligatory for copular sentences. This is, in fact, unnecessary if we accept Bach's (1967) proposal for introducing copulas in the auxiliary. Since the limiter is introduced on the VP node and the copula is introduced on the AUX node, the copula will automatically be to the left of the limiter whether or not limiter attachment moves the limiter.

This analysis also has the advantage of providing a simple explanation for a large set of words which appear to modify both NP's and VP's but do not share the mobility of limiters. Consider examples (32) and (33).

32. He was {constantly / continually / eternally / eventually / finally / subsequently / ultimately / briefly / frequently / promptly / quickly / rapidly / rarely / suddenly / surely} a hero.

33. He { constantly / continually / eternally / eventually / finally / subsequently / ultimately / briefly / frequently / promptly / quickly / rapidly / rarely / suddenly / surely } talked to anyone who would listen.

None of these words can replace the limiters in sentences (1), (3), or (4). Under Bach's treatment of the copula, the examples in (32) can be seen to be not noun phrase modification, but a special case of verb phrase modification.

One difficulty arises with this analysis because of sentences like (34).

34. Mary { just / only / merely } has a small bank account.

Bach suggests that <u>have</u> be introduced in the AUX node in the same manner as the copula. If <u>have</u> and <u>be</u> are in fact treated alike, then (34) should be unacceptable. Since Bach's reasons for treating <u>have</u> and <u>be</u> alike are largely independent, we could side-step the problem by insisting that possessive <u>have</u> be introduced in the same way as other English verbs.

In summary, it has been suggested that limiters can be introduced into the phrase structure attached to noun phrases and verb phrases. Limiters attached to verb phrases can optionally be moved to NP's which follow them. It appears that limiters occur in the positions indicated in examples (1), (3), (4), (6), and (7) above, but that many non-limiters can also occur in

Besides modifying adjectives, intensifiers also modify certain ly-adverbs. In general, if an intensifier modifies an adjective, then it also modifies the corresponding ly-adverb. Furthermore, if an intensifier does not modify a given adjective, then it also does not modify the corresponding ly-adverb. Thus, we find the combinations in (39) but not those in (40).[8]

39. {very, real, pretty, fairly, awfully, awful, too, more, most} {hurried(ly), prompt(ly), quick(ly), quiet(ly), sudden(ly)}

40. {very, real, pretty, fairly, awfully, awful, too, more, most} {*absolute(ly), *eternal(ly), *eventual(ly), *initial(ly), *subsequent(ly), *ultimate(ly)}

The data presented in (39) and (40) can be accounted for by the following three hypotheses:

41. Ly-adverbs are transformationally derived from the corresponding adjectives (without ly).

42. An adjective can be modified by any intensifier if and only if it can be modified by all intensifiers.

43. If an adjective can be modified by an intensifier, then the corresponding ly-adverb can also be modified by that intensifier.

If hypothesis (43) can be sustained, it would be strong evidence for (41). (43) is, of course, predicted by (41).

There are a small number of exceptions to (41). For example, hardly is too far removed in meaning from hard for a transformational derivation of the one from the other to be acceptable. Such exceptions can be easily handled by having separate lexical entries for the two words and marking hard as an exception to the rule posited by (41). This analysis is supported by the fact that the intensifiers listed in (39) and (40) can occur with hard but not with hardly.[9]

There are also a number of exceptions to (42). All of these are also exceptions to (43): In each case a specific intensifier is able to modify an adjective but not the corresponding ly-adverb. Consider, for example, (44) and (45).

44. Her decision seemed { pretty / awful / awfully } final.

45. She had decided { *pretty / *awful / *awfully } finally.

For reasons which remain obscure, most of the examples of this nature occur with adjectives which cannot occur with the intensifiers very, real, more, and most. Thus, (46) is unacceptable as well as (47).

46. *Her decision seem { very / real / more / most } final.

47. *She had decided { very / real / more / most } finally.

The list of specific intensifiers which can occur with an adjective but not with its corresponding ly-adverb, varies from adjective to adjective. As a comparison of (44) and (46) will illustrate, attempts to provide semantic explanations for these co-occurrence restrictions seem futile. Thus, it appears that in addition to whatever mechanism is used to mark adjectives as being modifiable or unmodifiable by intensifiers in general, it will be necessary to account separately for exceptions which violate hypothesis (42). The same mechanism which restricts modification by intensifiers can be used to block Ly-Adverb Formation in just those cases in which an exceptional intensifier has been attached to an adjective.[11] Notice that some mechanism for blocking Ly-Adverb Formation is required independently, to exclude the formation of tally from tall and fastly from fast.

The adjectives in (39) and (40) are distinguishable in that the absoluteness of the latter set allows no comparison or intensification. It may be that a semantic feature [absolute] is all that is necessary to distinguish these sets of adjectives.[12]

An interesting property of intensifiers is that they can be used to distinguish between deverbal adjectives and participles. Thus, telling can be seen to be an adjective in (48a) while it is clearly a present participle in (48b).

48. a. It was a very telling point.

    b. The salesman was (*very) telling us about a car.

Some speakers can accept (49a) but not (49b).

49. a. John was very surprised at Mary.

    b. ?John was very surprised by Mary.

It is clear that surprised in (49a) must be an adjective. Surprised in (49b) must also be an adjective for those speakers who find (49b) acceptable, for there is no corresponding active sentence with very.

50. *Mary very surprised John.

Those speakers who find (49b) unacceptable can be accounted for by simply noting that without the very this sentence can be the passive of (51).

51. Mary surprised John.

52. John was surprised by Mary.

For such speakers, (49a) is a copular sentence with a deverbal adjective surprised, while the verb of (49b) and (52) is surprised with the copula acting as a passive auxiliary.

Clearer cases of -ed serving as a derivational suffix can be found in words such as cross-eyed, long-legged, and possibly naked and rugged. Some of these adjectives can occur with intensifiers while others cannot.

53. He was { very / real / pretty / fairly } { cross-eyed / long-legged / *naked / rugged }

A.3 Adverbs

True adverbs, as distinguished from limiters and intensifiers are able to appear sentence finally as in (54).

54. John gave his books to Mary { yesterday / suddenly / frequently / deliberately }

They are unable to appear between verbs and following 'kernel' noun phrases except with parenthetical or appositive intonation.

55. *John gave {yesterday / suddenly / frequently / deliberately} his books to Mary.

The latter fact distinguishes true adverbs from limiters while the former distinguishes them from intensifiers.

56. a. John gave {just / only / merely} his books to Mary.

b. *John gave his books to Mary {very / real / pretty}.

Of the many distinguishing characteristics of one-word adverbs, those illustrated by (54) and (55) have been chosen because they also apply to what are traditionally called adverbial clauses and phrases. Thus, the sentences of (57) are acceptable while those of (58) are not.

57. a. John gave his books to Mary {because he liked her / after he kissed her / while thinking of Sue}.

b. John gave his books to Mary {on Friday afternoon / in the garden / with a foolish smile}.

58. a. *John gave {because he liked her / after he kissed her / while thinking of Sue} his books to Mary.

b. *John gave {on Friday afternoon / in the garden / with a foolish smile} his books to Mary.

The classification systems which have been proposed for true adverbs and the movement rules which apply to them will not be dealt with at this point. It is sufficient for the purposes of the present sketch to note that the semantic force of these adverbs is to modify entire verb phrases or sentences rather than specific verbs, adjectives, nouns, or noun phrases.

NOTES TO APPENDIX

1. No claim is being made at this point about the necessity or impossibility of distinguishing between VP and S.

2. Limiters are usually treated as a part of the determiner system and called prearticles (e.g., Thomas, 1965). Ability to modify VP's and prepositional phrases demonstrates that limiters have more grammatical functions than a prearticle analysis can describe.

3. This analysis was suggested by Sandra Thompson (personal communication).

4. The embedded question arguments were suggested by Robert Berdan (personal communication).

5. See Labov (1972) for a discussion of negative concord and negative attachment in several dialects of English. Labov's rule of Neg-Placement places neg in preverbal position. Neg-Postposing, which follows Neg-Placement, has the form

S.D.	W	[+NEG]	X	Indeterminate NP
	1	2	3	4
S.I.	1	Ø	3	2+4

6. (36b) is, of course, acceptable with an emphatic too. Emphatic too is not an intensifier. Too with the meaning 'also' is not an intensifier, either.

7. The union of the set of limiters and the set of intensifiers is nearly the same as Fries's Group D (Fries, 1952). See also Gleason

(1965). Note that while quite behaves like an intensifier in (35)-(38) it also behaves like a limiter in (1), (3), (4), (5), (6), and (7), but not (2) and (8). Thus, the status of quite is unclear. It does not even seem reasonable to analyze quite as belonging to both lexical classes.

8. Acceptability judgments for specific pairs may vary from person to person. Some speakers, for instance, may reject real hurried and real hurriedly. As long as both the adjective and the corresponding adverb are rejected, these examples still illustrate the point being made.

9. Distinguishing hard and hardly in the lexicon has diachronic justification as well as synchronic justification. Bloomfield (1933) notes that "the Old English adjective heard 'hard' underlay two adverbs, hearde and heardliche; the former survives in its old relation, as hard, but the latter, hardly, has been isolated in the remotely transferred meaning of 'barely, scarcely,' through loss of intermediate meanings such as 'only with difficulty.'"

10. There may be some dialectal or idiolectal variation with the sentences of (46).

11. This analysis of 'exceptional' intensifier-adjective pairs is somewhat complex. If it is in fact valid, one would expect that: (a) children would exhibit difficulty in learning such exceptions to exceptions; and (b) adults would show a high degree of inter-individual variation.

12. This terminology was suggested by Norman Gary (personal communication).

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VITA

Stanley Emanuel Legum was born in Norfolk, Virginia, on June 27, 1943, the son of Alma Davidson Legum and Harry Legum. After completing high school at Norfolk Academy in 1961, he entered Brown University in Providence, Rhode Island. During the summers of 1961 and 1962 he attended Old Dominion College in Norfolk, Virginia. The summer of 1964 was spent at Le Centre du Calcul of the University of Liège, in Liège, Belgium. He received the degree of Bachelor of Science in Applied Mathematics from Brown University in June 1965. During the summer of 1965 he was employed by the Data Processing Center of Old Dominion College. In September, 1965, he entered the Graduate School of the University of Texas at Austin as a student in linguistics. During the summer of 1966 he attended the Linguistic Institute of the Linguistic Society of America which was conducted at the University of California, Los Angeles. Since September, 1968, he has been employed as Member of the Professional Staff of the Southwest Regional Laboratory for Educational Research and Development, Los Alamitos, California, where he has been conducting research in sociolinguistics and first language acquisition. His publications include "The role of dialect in the school-socialization of lower class children" (with W. Stolz), "The verb-particle construction in English: Basic or derived?", "Syntactic variation as linguistic data" (with D. Elliott & S. A. Thompson), "Social dialects and their implications for beginning reading instruction" (with C. Williams & M. Lee), "On recording samples of informal speech from elementary school children" (with C. Williams), "The speech of

young Black children in Los Angeles" (with C. Pfaff, G. Tinnie & M. Nicholas), "Social dialects," "Review of Understanding Reading" (with B. Cronnell), and "On the necessity of semiordered rules." In 1970 he married Marsha Colleen Brown of Manhattan Beach, California. A daughter, Rachel Anne, was born in 1972.

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