WARNER, RICHARD GEORGE

DISCOURSE CONNECTIVES IN ENGLISH

The Ohio State University

University Microfilms International

Copyright 1979 by Warner, Richard George
All Rights Reserved
DISCOURSE CONNECTIVES
IN
ENGLISH
DISSERTATION

Presented in Partial Fulfillment of the Requirements for
the Degree Doctor of Philosophy in the Graduate
School of The Ohio State University

By
Richard George Warner, B.A., M.A.

* * * * *

The Ohio State University
1979

Reading Committee:
David Dowty
Michael Geis
William Lycan
Arnold Zwicky

Approved By
Adviser
Department of Linguistics
ACKNOWLEDGMENTS

This dissertation would not have been possible without the help of a number of people.

My greatest intellectual debt is to Professor Arnold M. Zwicky, my adviser. I am truly grateful to him for providing an exemplar of what a gifted scholar and teacher can be, as well as for his personal support at several critical points in my graduate career.

I also owe a great deal to the other members of my reading committee: Professor David R. Dowty, Professor Michael L. Geis, and Professor William G. Lycan. They too have helped me in my development as a scholar, and I have learned much from each of them, as well as from Dr. Robert J. Jeffers, who has left the groves of academia to pursue the butterfly of success through the concrete canyons of New York.

During the writing of this work, I have also profited enormously from the comments and opinions of many people besides those named above. A partial list of these people would include Professor Wolfgang U. Dressler, Professor Stephen Isard, Professor Robert N. Kantor, Professor Ilse Lehiste, Nancy S. Levin, Professor Ellen F. Prince, and Gregory T. Stump. I have also been fortunate in sharing the companionship of my fellow students, past and present, in the Department of Linguistics at the Ohio State University, which is a very special place, and that of the presiding genius of that place, Mrs. Marlene Payha.

I was also fortunate in getting Jeanne Kraus to rearrange her busy prenuptial schedule in order to take responsibility for typing and copying the manuscript; her help is much appreciated.

Finally, my very special gratitude to my wife, Patricia M. Warner. Without her love and understanding, and that of our daughter Elisabeth, my academic adventure would not have happened. Thank you, Patricia, with all of my heart.
VITA

September 6, 1944 . . . Born—Elizabeth, New Jersey

1969 . . . . . . . . . . . . . . . B.A., University of Connecticut, Storrs, Connecticut

1971-72 . . . . . . . . . . Guest Lecturer, University of Asmara, Asmara, Ethiopia

1972-74 . . . . . . . . . . Teaching Assistant, Department of English, University of Maine, Orono, Maine.

1974 . . . . . . . . . . M.A., University of Maine, Orono, Maine

1974-76 . . . . . . . . . . Teaching Associate, Department of English, The Ohio State University, Columbus, Ohio

1976-79 . . . . . . . . . . Teaching Associate, Department of Linguistics, The Ohio State University, Columbus, Ohio

PUBLICATIONS


"Students' Right to Whose Own Language?" Moreover VI,1 (Fall, 1975), 14-16.


"Teaching the Paragraph as a Structural Unit," College Composition and Communication XXX,2 (May 1979), 152-155.

Word order in Old Latin: copulative clauses. Forthcoming in Orbis.

FIELDS OF STUDY

Major Field: Linguistics

Discourse analysis. Professors Robert J. Jeffers and Arnold M. Zwicky

Comparative and Historical Linguistics. Professor Robert J. Jeffers

Syntax. Professors David R. Dowty, Michael L. Geis, and Arnold M. Zwicky

Semantics. Professors David R. Dowty, Michael L. Geis, and William G. Lycan
TABLE OF CONTENTS

ACKNOWLEDGEMENTS ................................................. ii
VITA .............................................................. iii
LIST OF TABLES .................................................. vii

Chapter

I. PRELIMINARIES. .................................................. 1
   1.0 Introduction ............................................. 1
   1.1 A Survey of Discourse Studies ...................... 2
   1.2 Local vs. Global: the Discourse Fragment .......... 8
   1.3 A Remark on the Data ................................ 11
   Notes to Chapter I ......................................... 14

II. TOWARD A TAXONOMY OF DISCOURSE CONNECTIVES .... 15
   2.0 Introduction ............................................. 15
   2.1 A Survey of Previous Taxonomies .................. 16
   2.2 A Semantic Taxonomy for Discourse Connectives .. 21
       2.2.1 CONJUNCTION .................................. 25
       2.2.2 CAUSATION ..................................... 27
       2.2.3 EXAMPLE ....................................... 29
       2.2.4 ALTERNATION .................................. 30
       2.2.5 CONDITIONAL EXCLUSION ...................... 31
       2.2.6 HEDGE ......................................... 33
       2.2.7 COMPARISON .................................. 34
   Notes to Chapter II ....................................... 35

III. THE SEMANTICS OF DISCOURSE CONNECTIVES .......... 37
   3.0 Introduction ............................................. 37
   3.1 CONJUNCTION .......................................... 38
   3.2 CAUSATION ............................................ 47
   3.3 EXAMPLE .............................................. 51
   3.4 ALTERNATION .......................................... 53
   3.5 CONDITIONAL EXCLUSION ............................. 57
   3.6 HEDGE ................................................. 63
   3.7 COMPARISON .......................................... 66
   Notes to Chapter III ..................................... 67

v
LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Frequency of Discourse Connectives Found in Sample</td>
<td>23</td>
</tr>
<tr>
<td>2. Summary of Results of Tests for Parataxis and Hypotaxis</td>
<td>84</td>
</tr>
<tr>
<td>3. Syntactic Categories of Connectives</td>
<td>109</td>
</tr>
</tbody>
</table>
Chapter I
PRELIMINARIES

1.0 Introduction

This dissertation is an attempt to provide an analysis of some of the syntactic, pragmatic, and semantic properties of a representative number of discourse connectives, such as otherwise, like, but, so, unless, etc., as they occur in natural, connected speech. But it also addresses a more general issue: whether or not levels of structure greater than the sentence can reasonably be said to be of grammatical interest. The claim that will be developed here is that they can be: that there do exist levels of linguistic organization, the proper constituents of which are sentences, which exhibit regularities of types heretofore discussed only at the sentence level, and that, moreover, these regularities can be described using the same analytical tools and formal devices which have been developed over the last 16 years or so under the general heading of generative semantics for use at the sentence level. In providing analyses of the discourse connectives in question, I will be supporting this claim. I will also be making some suggestions about what a grammar adequate to deal with these phenomena might be like.
1.1 A survey of discourse studies

To date, a number of scholars have argued that there are significant levels of structure beyond the sentence. But, although it has been generally accepted that linguistic context is an important factor in the surface form of sentences (e.g., by Firbas 1964, 1966, 1968, Karttunen 1971, 1974, Kuno 1972, 1975, and Sgall 1972, to name only a few of the more important papers of this kind), claims about linguistic structure for levels greater than the sentence have not generally been accepted. In this section, I will survey some of the approaches to discourse which have been taken and try to show why this lack of acceptance holds. These approaches can be grouped into four major categories: sociolinguistic, as exemplified by studies like that of Sinclair and Coulthard 1975 and Sacks, Scheglof and Jefferson 1974; metatheoretical, like Sanders 1970; structuralist/tagmemicist, like that of Pike 1964, 1965 and Longacre 1970; and text-linguistic, like that of van Dijk 1972.

A substantial number of discourse studies have been made by sociolinguists concerned with the dynamics of conversation. Studies of this kind have often been insightful and interesting, and certainly constitute legitimate lines of research. However, they have concerned themselves with the organization of social interaction, and not with any principles of formal linguistic structure. Thus Coulthard
(1977: 52), in his discussion of the conversational analyses of Jefferson, Sacks, and Scheglof, quotes Scheglof and Sacks (1973) in remarking that

...they work with conversational materials 'not because of a special interest in language, or any theoretical primacy [they] afford to conversation' (Scheglof and Sacks 1973) but because they see conversational analysis as a first step towards achieving a 'naturalistic observational discipline' to deal with details of social interaction in 'a rigorous, empirical, and formal way'.

And Sinclair and Coulthard, in their study of language use in the elementary classroom, make a strong and explicit distinction between grammatical (i.e., formal) structure and discourse (i.e., functional) structure (1975:27); their analysis is based on units of the latter type—from most to least complex, LESSON, TRANSACTION, EXCHANGE, MOVE, and ACT. And although they do note a 'rough correspondence' between sentence and MOVE, on the one hand, and clause and ACT on the other, they have nothing to say about the possibility of formal units more complex than sentences corresponding to the more complex functional units.

From a metatheoretical point of view, Sanders (1970:52) has argued that 'the only natural [i.e., autonomous and general] theories about language are universal discourse grammars and the metatheories which govern them'. But Sanders' argument is highly programmatic: he gives no explicit description of what a grammar of the kind he argues for might look like, and his claims are for that reason
empirically untestable. As empirical justification for doing discourse based, as opposed to sentence based, grammar, he notes that 'there are many obviously sentential properties and relations which cannot possibly be accounted for by any grammar whose domain consists only of single sentences' (1970:75). He then goes on to give examples of phenomena for which a sentence level grammar clearly cannot give an adequate account. But what Sanders does not do is to give evidence for the hidden premise to this argument: that the phenomena which he cites ought to be accounted for by any kind of grammar.

As a result, Sanders (1970) is not capable of making the obvious response to Bever and Ross (1965:7), who claim that 'the search for underlying discourse structures within the bounds of linguistics is futile'. This response is to point out that the sorts of phenomena which Bever and Ross use to support their imputation of futility could equally be used to support the claim that the search for underlying sentence structures within the bounds of linguistics is futile. Thus, Bever and Ross note that the interpretation of the following sequence

1. I think you should look at the Bible. The Ten Commandments have been an inspiration to young and old readers for centuries.

depends on the extralinguistic knowledge that the Ten Commandments are in the Bible, but 'if the phrase the Ten Commandments is replaced by Gödel's Incompleteness Theorems,
the sequence of sentences ceases to be a discourse' (1965: 7). What Bever and Ross fail to note is that the interpre-
tation of the following sentence depends on precisely the
same extralinguistic knowledge:

2. While reading the Bible yesterday, I drew consi-
derable inspiration from the Ten Commandments.

Compare this with the following:

3. While reading the Bible yesterday, I drew con-
siderable inspiration from Gödel's Incompleteness
Theorems.

It is not clear to me how this fails to be a sentence in
any different way than 1 fails to be a discourse under the
same substitution. In fact, both the programmatic (Sanders
1970) and what might be described as the antiprogrammatic
(Bever and Ross 1965) suffer from the same methodological
flaw: failure to make explicit just what a theory of gram-
mar ought to account for. Unfortunately for Sanders' posi-
tion, the burden of proof is on him, for he is the innovator.

The third major approach to the study of discourse
structure that I will discuss is tagmemics. Discourse
studies owe tagmemicists a considerable debt for their
resolute insistence that the sentence is not the most com-
plex level of linguistic organization. However, for various
reasons they have not given any indication of what this
linguistic structure might look like. Thus Pike (1964) in
arguing that 'beyond the sentence lie grammatical structures
available to linguistic analysis' (1964:50) confines himself
to a description of some of the effects of context on the semantic interpretation of sentences (descriptions which, I might add, appear to admit no distinction between linguistic and arguably nonlinguistic information) without attempting to deal with the larger structures themselves. In Longacre (1970), on the other hand, attempts are made to state some claims about the structures characteristic of various types of discourse (narrative, expository, dramatic, etc.), but these structures are described in terms (aperture, closure, denouement, etc.) more descriptive of rhetorical and poetical function than of linguistic form. Even work like that of Young and Becker (1965), which purports to provide a structural description of the paragraph, turns out to be more concerned with rhetorical function than with linguistic form: the work gives no argumentation that there is such a grammatical, as opposed to rhetorical, object as a paragraph, nor does it give any formal characteristics of the functional units topic restriction and illustration which Young and Becker identify within the paragraph.

The final approach to the study of discourse that I will discuss here is that of van Dijk (1972). This work is an attempt to show that the inadequacies of sentence level grammar motivate a theory of grammar which has the discourse, and not the sentence, as the primary level of linguistic organization. The task of such a text-grammar is to
generate all and only the wellformed texts of a given language; such a grammar would, of course, also generate the wellformed sentence of that language. One of the central claims that van Dijk is concerned to demonstrate in this work is that sentence grammars are formally dissimilar to text grammars. His arguments in support of that claim--based severally on a spurious naturalness argument and an appeal to the inability of sentence grammars to account for such a phenomena as definiteness, pronominalization, relativization, topic/comment relations, and coherence--are refuted by Dascal and Margalit (1974), who argue persuasively that van Dijk (1972) fails to justify its author's program.

An additional criticism of this work is that van Dijk's apparent assumption that all anomalies in a given discourse must be explicable by the grammar forces him to develop an inordinately complicated armory of theoretical apparatus. There is no reason to assume, for example, that 4 is bad for grammatical reasons:

4. We will have guests to lunch. Calderón was a great Spanish writer.

In fact, it is possible to construct contexts in which 4, bizarre in isolation, is quite reasonable. (Consider, for example, the case of an ardent Hispanophile with literary pretensions, whose custom it is to celebrate the birthday of each great Spanish writer with a small luncheon party,
informing his household staff as follows:

5. Tomorrow is Calderón's birthday, so we will have guests to lunch. Calderón was a great Spanish writer, and we wouldn't want to miss this chance to honor him.

But van Dijk does assume that 4 is ungrammatical, and constructs his theoretical apparatus so that it is excluded. As a result, Longacre, in his generally favorable review of this work, remarks that 'the resultant formal structure is so intricate, involved, and lengthy that perhaps no one will be interested in looking at it when one is through [stating it]' (1976:173). This degree of complexity would be tolerable if it were necessary; my opinion, however, is that it is not necessary here.

1.2 Local vs. global: the discourse fragment

In his discussion of the history of what he refers to as the classical problem of logical form, Katz (1972:xvi) observes that 'By concentrating on manageable problems, linguistics and (to a far greater extent) logic were able to achieve a large measure of success'. Katz is concerned with arguing that a problem with concentrating on the manageable problems is that central problems will be overlooked as being too difficult. Nevertheless, there is a point in the history of any field of enquiry where sticking to the manageable problems seems a sound procedure. This is especially true in the case of a field like discourse grammar,
which at present can boast hardly any noncontroversial results at all.

It is my opinion that this unhappy situation is largely due to the kinds of problems which previous studies in this area have addressed. The phenomena involved have been phenomena ranging over indefinitely long sequences of text: global phenomena such as definiteness/indefiniteness (van Dijk 1972), conditions for pronominalization (Kantor 1977), or cohesion (Halliday and Hasan 1976). But each of these phenomena involves a large number of variables, each of which affects, in only partially understood ways, the phenomenon in question.

The phenomenon that I am concerned with, by contrast, is a local one: discourse connectives have the function of linking pairs of sentences within discourse. Accordingly, the unit of structure I will be concerned with will be, not the discourse as a whole, but the discourse fragment, which typically consists of two sentences and a discourse connective expressing the relation that holds between them. This sort of a discourse fragment is exemplified by 6:

6. I didn't have a chance to go grocery shopping this week. So it looks like leftover otter haunches for dinner tonight.

(The discourse connective in this case is so.) Within the discourse fragment, the connective is invariably found within the second sentence. It usually consists of a single word, but may be an idiomatic expression—usually a
prepositional phrase such as on the other hand, by the same token, and the like. That these are idioms can be demonstrated by attempting to substitute into them: ?on the alternate manual extremity, ?by the same omen. (Historically, of course a number of one-word discourse connectives did evolve from prepositional phrases used idiomatically: because, from by cause (that) is perhaps the best known example, but see also otherwise from OE on ðære wisan and unless from ME on less 'on a lesser or lower condition'. Still others (e.g. however, whereas) had their origins as adverbial phrases.)

Again, let me stress that the relatedness expressed by discourse connectives is a local phenomenon, holding between pairs of sentences within discourse, and not between individual sentences and the discourse as a whole. Moreover, this kind of relatedness between sentences is not transitive. In the following synthetic fragment for example, each member of each pair of contiguous sentences is related to the other, but the last sentence is not related to the first in any obvious way:

7. Harry beats his wife. But not because he loves her. In fact, he loves her sister Alice. But unfortunately for Harry, Alice is already happily married. So he's going to give up sex and become a Trappist monk.

Hence the oddness of fragment 8:

8. ?Harry beats his wife. So he's going to give up sex and become a Trappist monk.
Since an analysis of these discourse connectives can be provided without the necessity of dealing with indefinitely long sequences of sentences, it should be possible for me to make stronger and more easily tested claims about the existence of suprasentential linguistic structure than have been made to the present date (this point was emphasized by Wolfgang Dressler in a discussion we had some time ago). Thus, in the terms with which I began this section, it should prove a more manageable task than some that have been attempted within the general confines of discourse research. On the other hand, it is clear that my present strategy cannot be expected to shed any light on the global properties of discourse structure, about which the present study will make no claim.

1.3 A remark on the data

My first concern in the present research was to ascertain to what degree discourse connectives like those discussed above are used in speech which was both spontaneous and colloquial (i.e., unedited and non-literary). I wanted to get a clear idea about which discourse connectives were used, together with some notion of their frequency. I also wanted to get some notion of how they are used in ordinary speech. To do this, I needed a large sample text to examine, a text which would represent a broad spectrum of speakers not overly influenced in their language behavior by
prescriptive considerations. I found such a text in *Working*, by Studs Terkel (1975), a work which comprises some 325,000 words of prose, consisting of Terkel's transcriptions of working people's oral descriptions of their jobs and how they felt about them.

My survey of *Working* showed that people do indeed use discourse connectives in their daily conversation. For, of the 325,000 words of text, about 1890 (or a little fewer than 0.6 percent) were discourse connectives of the kinds I will be discussing below. A complete summary of the discourse connectives identified in this survey, with their frequencies, is given as Table 1 below, and representative examples of discourse fragments containing each connective identified are listed in section 2.2. This number struck me as surprisingly high, especially considering that I did not include any temporal connectives (e.g., then, afterward, before that, etc.) in the sample. Also, I was not concerned to identify every connective in the entire work, and I'm sure I missed some. One result of the survey, then, was to demonstrate that the number of discourse connectives occurring in normal conversation represents a significant fraction of that conversation.

Many of the data used as examples in this study are from *Working*; these examples are identified as they occur, along with the page upon which they were found. But I did not restrict myself in my discussion of discourse connectives
to data from this sample, and that for two reasons. First, because an understanding of the discourse fragments occurring in *Working* was often dependent on the context, and hence use of that data would have involved lengthy glosses which would have noticeably obscured and retarded my exposition. So in cases where the only examples of a particular discourse connective fell into this category, I created my own. Secondly, and more importantly, one of the most fruitful varieties of data for any kind of linguistic analysis are the sentences, or in this case the discourse fragments, which do not get produced by speakers. These will obviously not appear in samples like *Working*, but by allowing us to manipulate certain variables and hold others constant, they can be of enormous help in seeing just what can go wrong when people talk. Hence, they allow us to make much more interesting claims about what can and cannot happen in human language.
Notes

1Dating from Lakoff, 1963. I should perhaps mention at this point that there is little in the present work which generative semanticists would find a great deal easier to swallow than would others working within the general paradigm of generative grammar.
Chapter II

TOWARD A TAXONOMY OF DISCOURSE CONNECTIVES

2.0 Introduction

As Halliday and Hasan note in their chapter on discourse connectives (which they include under the term conjunction):

Various suggestions could be taken up for classifying the phenomena which we are grouping together under the heading of CONJUNCTION. There is no single, uniquely correct inventory of the types of conjunctive relation; different classifications are possible, each of which would highlight different aspects of the facts. (1976:238)

In this chapter, I will show why the taxonomies presented in several previous discussions of discourse connectives (i.e., those of van Dijk 1977a, Quirk et al. 1978, and Halliday and Hasan 1976) are, for a number of reasons, inappropriate to my present program.

Next I will present, without argument, a taxonomy based on the semantic characteristics of the discourse connectives found in Working. (Arguments for these semantic properties, and support for the position that any additional notional content that these connectives may have is not semantic, is provided in Chapter III.) My method will be to identify each semantic category, define its characteristics, and list the discourse connectives which were
found to realize it in the sample. Moreover, for every connective which appeared more than once, I will also provide an example from the text. (A list giving the approximate frequency of these connectives is given, broken down into semantic category, as Table 1.)

2.1 A survey of previous taxonomies

In van Dijk (1977:14-15), the author provides a nontional taxonomy of discourse connectives, which he identifies as a 'traditional classification', containing eleven categories. It is not clear how seriously this taxonomy is to be taken—van Dijk presents this list 'for convenience', and presumably does not consider anything important to depend on it. At least, he makes no attempts to motivate it by characterizing what nontional properties the members of each category have in common. But the assumption that the reader must make is that the various categories are in fact comparable: that the difference between, e.g., the category conjunction and the category disjunction is the same sort of difference as that existing between either of these categories and the category contrast. But this, given the way the following connectives are distributed among the various categories, is equivalent to saying that the same degree of difference exists between and and but as exists between either of these connectives and or. As I
argue in Chapter III, this does not appear to be correct. Hence the motivation for the taxonomy seems insecure.

Another notional taxonomy of discourse connectives is presented by Halliday and Hasan (1976:238-267) in their discussion of conjunction, which they identify as one type of cohesive relation occurring in discourse. Their first distinction is between what they refer to as external and internal conjunction. Using the sequences 1a and 1b, they characterize this difference as follows:

1a. She was never really happy here. So she's leaving.

b. She'll be better off in a new place. --So she's leaving?

'In [1a, illustrating external conjunction] there is a causal relation between two events—or two phenomena, let us say, since the first is a state rather than an event. The meaning is "because she was not happy, she's leaving". In [1b, illustrating internal conjunction] there is also a causal relation, but it is within the communication process; the meaning is "because you refer to her being about to be in a new place, I conclude she's leaving"' (1976:241).

This is an interesting distinction, but not one that I shall exploit in the present work to any great extent (reference to an at least similar distinction is made in section 3.2, below, however).

Of greater potential relevance is their division of the various discourse connectives into the categories
additive, adversative, causal, and temporal. This division, they recognize, is anything but 'delicate', but their position is that it is just delicate enough 'to handle a text without unnecessary complication', without being 'more complex than is needed for the understanding and analysis of cohesion' (1976:239). To understand why they take this position, it is necessary to appreciate Halliday and Hasan's notion of what cohesive relations are. These relations are neither 'structural' or 'logical', but textual: i.e., functioning to form a text, which Halliday and Hasan (1976: 2-3) characterize as 'a unit of language in use...[functioning] as a unity with respect to its environment'. It is this sort of relation which conjunctions realize, according to Halliday and Hasan; hence conjunctions (which correspond to discourse connectives) are taken to be quite distinct from sentence-internal connectives, which do express logical and structural relations. The program of Halliday and Hasan (1976), then, is quite different from my own, and there would be no reason to assume that I would find their taxonomy useful for my present purposes. And in fact it would make no sense at all, in terms of the system I state in the following section, to assign and and but to two distinct major categories (additive and adversative, respectively) and yet list because and otherwise as members of the same category (causal). This is what Halliday and Hasan do, yet, as I argue below, and and but are more
syntactically and semantically similar to each other than are otherwise and because.

The third taxonomy I will discuss is that presented in Quirk et al. (1978). This work nowhere makes reference to a single class of discourse connectives. Instead, the authors refer to three syntactic categories which are collectively equivalent to that class. These syntactic categories are: **conjuncts**, which are 'adverbials [adverbs or prepositional phrases] having a primarily connective function' and 'peripheral to clause structure' (1978:421) such as on the other hand, otherwise, consequently, and the like; **coordinators**, including and, or, and but (1978:552); and **subordinators**, corresponding to the traditional class of subordinating conjunctions such as unless, because, if, etc. (1978:727). These syntactic categories are not implausible; indeed, the categories set up by Quirk et al. (1978) correspond quite closely to those I discuss in Chapter IV, below, with conjuncts corresponding to members of my types II and III, coordinators corresponding to type I, and subordinators corresponding to type IV.

The inadequacy (at least for my present purposes) of the taxonomy proposed in Quirk et al. 1978) is not due to any failure to distinguish among the different categories which they propose, for their distinctions are clear and plausible. It is rather due to their failure to capture any similarities which may exist between the members of
different classes. For one thing, I feel that their taxonomy, by making the syntactic characteristics of primary importance, places too much emphasis on the differences (which I argue in Chapter V to be relatively superficial) between conjuncts and subordinators. Yet there is little, if any, explicit reference made to the semantic parallels between individual members of the various classes. There is, for example, a fairly comprehensive list of the notional varieties of conjuncts (1978:520-521), where the various subclasses are identified as enumerative, additive, summative, inferential, contrastive, etc. There is also a discussion of the logical connectors, a class which includes the coordinators and for (which is not listed in any of the syntactic categories, but which is noted to be on 'the gradient between "pure" coordinators and "pure" subordinators'—1978:552). In this discussion, the authors use nouns like enumeration, addition, summation, inference, and contrast to denote what they call logical relationships between sentences (1978:661). The similarity of these terms for the subclasses is presumably not accidental. Yet the authors do not make the reasons for it explicit. Indeed, by using nouns to characterize one class, to which they also give the special status of logical connectors, and adjectives to characterize the other, they imply that the notional relationships expressed by members of the different syntactic classes are themselves of different kinds,
although here again they do not make it plain where that
difference lies.

Moreover, Quirk et al. (1978) gives no notional tax-
onomy at all for subordinators (although a classification
based on the subordinator's internal structure is provided
--v. 1978:727-728). Instead, what the authors do is to
identify the adverbial subordinate clauses containing such
subordinators as because, unless, and like as members of
various syntactic classes of adverb (1978:731). They then
go on to provide an extremely traditional kind of taxonomy
for these clauses, discussing clauses of purpose, result,
time, place, etc. They can treat connectives like because,
unless, and like in this way because being slanted toward
literary usage, they only consider these forms when they
occur sentence internally. But as we shall see, these
forms were also frequently used in my sample like conjuncts,
to signal a relationship between the sentences in a dis-
course. The system of classification used by Quirk et al.
(1978) does not allow for this possibility.

2.2 A semantic taxonomy of discourse connectives

Discourse connectives are the surface representations
of certain semantic relations binding the logical structures
underlying sentences in discourse. The position that I
will be taking here is that discourse fragments have seman-
tic structure, that this structure is compositional, and
that it consists of the logical structures underlying the sentences within the discourse fragments in question, together with the semantic relations between those logical structures. In the present section, I identify seven of those relations, list the discourse connectives which provide their surface representations, and define them in terms of the contributions which they make to the truth conditions of the discourse fragments in which they appear.¹ I will define these truth conditions in terms of entailments, and I should make it clear at this point that by the term entailment I mean to convey a relation between logical structures such that if one logical structure $P$ entails another logical structure $Q$, then $Q$ cannot be false without $P$ also being false. Hence, strictly speaking, discourse fragments, like sentences, have entailments only derivatively, by virtue of their underlying logical structure. However, in order to avoid the cumbersome locution, 'entailments of the logical structure underlying the discourse fragment', I will instead speak of 'entailments of the discourse fragment'.

Two of the semantic properties which I will use as criteria for this taxonomy are of sufficiently wide application to warrant being stated here. These properties, extractivity and commutativity, allow us to calculate certain of the entailments of discourse fragments containing connectives representing each relation directly from the
# TABLE 1

FREQUENCY OF DISCOURSE CONNECTIVES FOUND IN SAMPLE

<table>
<thead>
<tr>
<th>Semantic Class</th>
<th>Discourse Connective</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CONJUNCTION:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SIMPLE</td>
<td>and</td>
<td>530</td>
</tr>
<tr>
<td></td>
<td>also</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>too</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>nor</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>more than that, not only</td>
<td>1 each</td>
</tr>
<tr>
<td></td>
<td>that, not...either</td>
<td></td>
</tr>
<tr>
<td>ADVERSATIVE</td>
<td>but</td>
<td>420</td>
</tr>
<tr>
<td></td>
<td>yet</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>though</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>whereas</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>on the other hand</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>still</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>at the same time</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>although</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>however, even though</td>
<td>2 each</td>
</tr>
<tr>
<td></td>
<td>only, but then again</td>
<td>1 each</td>
</tr>
<tr>
<td><strong>CAUSATION</strong></td>
<td>so</td>
<td>293</td>
</tr>
<tr>
<td></td>
<td>because/’cause</td>
<td>98</td>
</tr>
<tr>
<td></td>
<td>consequently</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>therefore</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>whereas</td>
<td>1</td>
</tr>
<tr>
<td><strong>EXAMPLE</strong></td>
<td>like</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>where, for one thing</td>
<td>2 each</td>
</tr>
<tr>
<td></td>
<td>example, for instance</td>
<td>1 each</td>
</tr>
<tr>
<td><strong>ALTERNATION</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INCLUSIVE</td>
<td>or</td>
<td>44</td>
</tr>
<tr>
<td>EXCLUSIVE</td>
<td>or else</td>
<td>4</td>
</tr>
<tr>
<td><strong>CONDITIONAL</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EXCLUSION</td>
<td>otherwise</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>unless</td>
<td>3</td>
</tr>
<tr>
<td><strong>HEDGE</strong></td>
<td>at least</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>anyway</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>in fact</td>
<td>3</td>
</tr>
<tr>
<td><strong>COMPARISON</strong></td>
<td>like</td>
<td>12</td>
</tr>
</tbody>
</table>
truth conditions of the component sentences of those discourse fragments. These truth functional properties are defined as follows:

A. For any relation \( R \) underlying some discourse connective \( r \), \( R \) is extractive if and only if, for any logical structures \( P \) and \( Q \), \( R(P,Q) \) entails both \( P \) and \( Q \).

B. For any relation \( R \) underlying some discourse connective \( r \), \( R \) is commutative if and only if, for any logical structures \( P \) and \( Q \), \( R(P,Q) \) entails \( R(Q,P) \).

One of these properties, commutativity, licenses a mode of inference familiar from the sentential, or propositional calculus. The other, extractivity, licenses a mode of inference—extraction—which bears an obvious resemblance to another mode of inference, simplification, which itself depends on the property simplifiability. This property is stated as follows:

C. For any relation \( R \) underlying some discourse connective \( r \), \( R \) is simplifiable if and only if, for any logical structures \( P \) and \( Q \), \( R(P,Q) \) entails \( P \).

The term extractivity refers to the property of logical structure allowing sentences to be extracted from the discourse fragments containing them salva veritate. The relationship between the two modes is as follows: any relation allowing extraction will allow simplification, but not vice versa. I chose extractivity instead of simplifiability because the more traditional term, as defined above, would
yield misleading results when applied to relations of the categories COMPARISON and HEDGE: see below.

But the semantic relations underlying a number of discourse connectives contain additional, idiosyncratic, semantic content which gives rise to additional entailments. Hence, not all of the entailments of discourse fragments containing these connectives can be calculated directly from the truth conditions of their component sentences. These additional entailments, which provide part of the basis for the present taxonomy, are each identified in the section wherein is discussed the semantic relation of which they are characteristic.

2.2.1 CONJUNCTION

Connectives of this category were the most frequently used in the sample; my estimate is that they were used more often than members of all of the other categories combined. The following fragments provide examples of the usage of each member of this category which appeared more than once in the sample—the connectives themselves are underlined.

2. [The strike] spread from here to the east coast. And it went on for nine weeks. (Working, p. 292)

3. I think it involves talent. Also, it involves a language that fewer and fewer people can speak. (Working, p. 116)

4. ...if we have only thirty minutes and we don't have time to eat, it's our hard luck. Pilots have the same thing, too. (Working, p. 76)
5. I don't have to sit over four martinis. Nor can I deal with an account who says, 'Get me a broad'. (Working, p. 493)

6. The captain landed perfect. But there was a little jolt, and the passengers started screaming and hollering. (Working, p. 81)

7. First thing comes to my mind is to shut my eyes just a few minutes. Yet I know I can't shut 'em for too long, I know I gotta get up. (Working, p. 233)

8. These people, they have a resentment that everything is coming to them. Whereas the Polish people worked their way out of the Depression. (Working, p. 631)

9. So the black people don't cooperate with the police and they have good cause not to. On the other hand they're begging for more police service. (Working, p. 197)

10. ...There was no reason for me to stay in their culture. Still I was making friends with different people. (Working, p. 577)

11. There was a camaraderie of sorts. It wasn't healthy, though. (Working, p. 373)

12. It's hard work; stone is heavy. At the same time, you get interested in what you're doing and you usually fight the clock the other way. (Working, p. 18)

13. I've been an executive secretary for eight years. However, this is the first time I've ever been on the corporate end of things, working for the president. (Working, p. 90)

14. We don't get [respect] from the bosses or the guests. Although they are nice to us. (Working, p. 55)

15. This is why he's so successful as a salesman. Even though he's tired. (Working, p. 593)

(Within each category, including this one, the connectives are presented by their relative frequency in descending
order. This category, however, has been further divided—both here and in Table 1—into the pragmatic categories SIMPLE and ADVERSATIVE. For discussion of this subdivision, see Section 3.1. For the actual number of occurrences of each connective, see Table 1.)

From a purely semantic point of view, connectives of this category are quite straightforward, being, as Gazdar and Pullum 1976 observe in regard to and, merely lexicalizations of the logical conjunction operator, K. As such, they allow extraction and commutativity, and have no semantic content beyond that which a truth table for logical conjunction would reveal: any discourse fragment containing a discourse connective of this class will be true if and only if each of its component sentences are true.

2.2.2 CAUSATION

There were more occurrences of discourse connectives realizing the CAUSATION relation, C, than realized any other except for CONJUNCTION. The connectives realizing CAUSATION are illustrated in fragments 16-19:

16. We have a lowering device--the casket is put on that--covered with green. So people don't see the bare hole in the ground, which is very traumatic. (Working, p. 657)

17. A younger person cannot start farming unless they have help from the father or somebody. 'Cause you have to be almost able to retire a rich man to start out. (Working, pp. 25-26)
18. Black folks don't have a voice to complain. Consequently, they continue to be victims of shadowy, improper, overburdened police service. (Working, p. 195)

19. Whereas you're just a teller. Therefore he can call you by your first name. (Working, p. 350)

Discourse fragments containing connectives of this category entail the conjunction of their component sentences. However, the CAUSATION relation is stronger than CONJUNCTION, since the reverse is not true. This is due to the fact that the presence of a discourse connective realizing CAUSATION entails that the state of affairs described by one of the sentences is the cause of the state of affairs described by the other. This relation is, like the predicate CAUSE, asymmetrical and does not allow commutativity: C(P,Q) does not entail C(Q,P), nor does 16, e.g., entail 20:

20. We have a lowering device... covered with green. Because people don't see the bare hole in the ground, which is very traumatic.

However, CAUSATION will be lexicalized into either of two sub-varieties of form, depending on the surface ordering of the two sentences within the discourse fragment. If effect follows cause, the relation is realized as so, consequently, or therefore, as in 16, 18 and 19, respectively. But if the effect precedes the cause, as in 17, the relation is realized as because. Thus 21 is a paraphrase of 16:

21. People don't see the bare hole in the ground, which is very traumatic. Because we have a lowering device—the casket is put on that—covered with green.
(This matter of lexicalization of asymmetrical relations and its dependency on superficial ordering is discussed at greater length in Chapter V.)

2.2.3 **EXAMPLE**

The least commonly expressed of the relations allowing extraction was EXAMPLE. The discourse connectives realizing this relation, $E$, are illustrated in fragments 22-24:

22. He was bad news. Like he'd never eat because he thought he'd have to pay for it and he didn't have the money. *(Working, p. 619)*

23. Something very simple you used to do in five minutes takes you five days. Hospital costs have gone up since computers. The cost of an error is so fantastic. Where if you've paid ten dollars and I've written down a receipt for a hundred, it's a simple little mistake. *(Working, p. 648)*

24. Yeah, I prefer laboring to bookkeeping. For one thing, a bookkeeping job doesn't pay anything. *(Working, pp. 150-51)*

This relation identifies one statement as an example, or illustration, of another statement. Like CAUSATION, it entails, but is not entailed by, CONJUNCTION, since it has additional semantic content. Roughly, it entails that a statement within a discourse fragment provides a specific example of a generalization specified by some previous statement. Like CAUSATION, EXAMPLE is not commutative. But unlike CAUSATION, it does not have alternative lexicalizations which depend on the surface ordering of the sentences within the fragment.
2.2.4 **ALTERNATION**

There are two discourse connectives realizing the ALTERNATION relation, A. These are illustrated by 25 and 26, respectively:

25. They were either paying to act out a fantasy or they were paying for companionship or they were paying to be seen with a well dressed young woman. Or they were paying for someone to listen to them. (Working, p. 92)

26. Then we'd go to bed. *Or else* we'd start hacking away at our personal problems. (Working, p. 693)

I know of no reason to doubt that or is simply a lexicalization of the logical connective INCLUSIVE DISJUNCTION. That is, any discourse fragment consisting of two sentences connected by or will be true if and only if one or both of the two sentences is true. The facts regarding or else, however, are not as clear. A discourse fragment like 26 will certainly be true if one of the two sentences is true. But there is at least an implicature that one of these sentences must be false. Yet it is not obvious that fragments like 26 are false if both sentences are true. If they are, then the falsity of one of the disjuncts is an entailment. In that case, or else is a lexicalization of EXCLUSIVE DISJUNCTION, and hence semantically distinct from or. But if they are not—if the requirement that one of the disjuncts be false is an implicature—then the difference between the two connectives is purely pragmatic.
I will return to this issue in Chapter IV. For the present, I will include both of these connectives as surface representations of the ALTERNATION relation, merely identifying or as INCLUSIVE and or else as EXCLUSIVE without prejudice. At any rate, as realizations of ALTERNATION, both of these connectives allow commutivity; neither, however, allows extraction.

2.2.5 CONDITIONAL EXCLUSION

CONDITIONAL EXCLUSION was realized in the sample by the connectives otherwise and unless, as illustrated by 27 and 28, respectively:

27. I smile when I have something to smile about. Otherwise, I don't. (Working, p. 382)

28. If you hit a person's logic, you've got 'im. Unless you've got a dingaling. (Working, p. 303)

The semantic properties of this relation, $X$, are quite controversial. It is widely assumed that the connectives unless and otherwise are realizations of the same relation as if...not (see, for example, Onions 1970:51, van Dijk 1977a:15, and Quirk et al. 1978:746 for discussions of unless, and Halliday and Hasan 1976:259 and Quirk et al. 1978:670 for discussions of otherwise, from this point of view). But Geis (1971) has demonstrated that unless does not have the same interpretation as the negative conditional, but rather denotes a stronger relation: for Geis, sentences of the form $p$ unless $q$ are to be interpreted as 29, while $p$
if not q has an interpretation like 30, which is an entailment of 29.

29. P in any event other than that Q

30. P in the event that not Q

It has since been argued (Warner, 1978) that otherwise represents the same semantic relation as unless—that both have the same interpretation.

This relation, I will argue in section 3.5, is not commutative and does not allow extraction. Discourse fragments expressing this relation entail some sort of disjunction of their constituent sentences. That is, such fragments are true if one of those sentences is true and false if both of those sentences are false. But it is not clear whether this disjunction is inclusive or exclusive. Discourse fragments containing such connectives give rise to the understanding that one of their constituent sentences is false, to be sure. There is thus a strong implicature, at least, that the disjunction entailed by the fragments is exclusive. But I am not prepared to argue that it is an entailment, in the sense which I have defined above (section 2.2). One thing, at any rate, is clear: it turns out that of the two sentences related by such connectives, only one will be expressed by a main clause in the indicative mode. The other (or others) will be expressed by either a subordinate clause or a main clause in the subjunctive (counterfactual) mode, or by a sentence realizing
some speech act type other than assertion. This suggests that only one of the sentences of such a fragment—viz., the one in the indicative main clause—can properly be claimed to be said, in the favored sense of Grice 1975, or entailed, in the sense I use here.

2.2.6 HEDGE

Discourse connectives realizing the HEDGE relation, H, seem to have the rhetorical effect of allowing the speaker to disclaim responsibility for the truth of the first sentence of a discourse fragment while asserting the truth of the second. But this disclaimer does not amount to a denial of the first sentence; instead, the speaker is hedging—presenting the first sentence as sort-of-true: not exactly false, but not as true as the second. (The term HEDGE is due to G. Lakoff 1972. In section 3.6 I will make it clear that I am using the notion sort-of-true in a non-standard way, not exactly as Lakoff did.)

Examples of discourse connectives realizing this relation are given in 31-33:

31. I liked the factory much better, aside from the money. ... At least it wasn't humiliating. (Working, p. 666)

32. I can't shoot an unarmed person. No way. Anyway, knowing people, they'll say, 'Forget it, we're insured'. (Working, p. 192)

33. They treat him like a farm implement. In fact, they treat their implements better and their domestic animals better. (Working, p. 36)
Semantically, these discourse fragments entail the propositions named in their second sentences, but not that named in their first. Hence, the HEDGE relation allows neither commutivity nor extraction.

2.2.7 COMPARISON

Only one discourse connective realizing the COMPARISON relation, \( S \), occurred in the sample. This connective is like; its usage is illustrated in 34.²

34. That's the worst thing, the way they treat you. Like you have no brains. (Working, p. 38)

The semantics of this relation are deceptive. Discourse fragments containing it entail that a relationship of similarity obtains between the two states of affairs named by the sentences within each fragment, and similarity is a symmetrical relationship: if Ralph is like Harry, then Harry must be like Ralph in the same way. But the COMPARISON relation is not symmetrical: as fragment 34 suggests, discourse fragments containing it entail that the state of affairs named by the first sentence obtains, but not that named by the second. Accordingly, this relation allows neither extraction nor commutativity.
This taxonomy is not meant to be exhaustive, either of the connectives appearing in Working or of those connectives available to speakers of English. For a number of the latter class did not appear in my sample, including for, moreover, else, alternatively, and furthermore (although they are possible surface representations of relations identified in the present taxonomy). Also, there was a residue of forms appearing in Working which did not appear to fit into any of my categories. Some of these could have been assigned a category if I had wanted to construct one on the basis of one or two examples (e.g. especially if, so that, if anything). Others, such as I mean, now, well, anyway, so, really, are not discussed because they appear to lack any semantic content. These NARRATIVE MARKERS, which don't appear to participate in any structural relationships within their sentences or discourse fragments, seem to serve a purely conversational function. One is almost tempted to classify such forms as paralinguistic and hence as extragrammatical: at least, there seems to be no clear break along the continuum from the verbalized pause [ə:] through [ˈðəʊ] to well, while the absence of semantic content characteristic of such forms does allow a clear distinction to be drawn between them and such discourse connectives as (e.g.) because.

One problem that emerges in a taxonomy of this kind is motivating a grammatical difference between homophonous, but allegedly distinct, connectives. The sequence /layk/, for example, appears as a lexicalization of the class EXAMPLE as well as of the class COMPARISON. In this case, the distinction can be motivated. For one thing, the form realizing COMPARISON can cooccur with just; that realizing EXAMPLE can't:

That's the worst thing, the way they treat you.
Just like you have no brains.

*There are a lot of reasons why I would never hire you. Just like you have no brains.

(Notice here that the badness of the second fragment is not due to the form of either sentence in isolation. This fact is cited again in Section 4.1. For additional differences
between the two like's, see Section 4.2.) But litmuses are not always available. Thus, my dictionary and my intuitions agree that there is both a CONJUNCTION whereas and a member of the class CAUSATIVE with the same phonological representation. Yet no test of my devising can reveal any grammatical difference to supplement this apparent semantic difference.
Chapter III
THE SEMANTICS OF DISCOURSE CONNECTIVES

3.0 Introduction

In the previous chapter, I provided a taxonomy, based on semantic properties, for the discourse connectives found in Working, my sample text. I claimed there that the members of each class identified have sufficient semantic properties in common (properties not shared by members of the other classes) to warrant their inclusion in a single, uniquely definable class. In this chapter, I will motivate this claim by giving arguments that the members of each class show all and only the semantic properties identified in Chapter II; this will include, where necessary, demonstrating that any other notional properties are not semantic. I will not attempt to give arguments for the semantics of all the members of each class; since there were 38 discourse connectives identified in the sample, and since there were a number of discourse connectives (such as moreover, for, nevertheless, alternatively, etc.) which did not occur in the sample, such a procedure would be both tedious and unprofitable. What I will do is identify the more commonly used connectives of each class and use them to define the properties of the class as a whole.
3.1 CONJUNCTION (K)

There is no controversy about the claim that each member of the class CONJUNCTION shows just the same semantic properties as the logical operator K. That is, any discourse fragment consisting of two sentences connected by a member of this class will entail the logical conjunction of the propositions named by its constituent sentences. What is at issue here is the status of any additional lexical content conveyed by discourse connectives of this class. The position I will be arguing for is that any such additional content has no effect on the truth conditions of the discourse fragments containing the connectives in question.

A contrary claim has been made by R. Lakoff (1971). Citing G. Lakoff and Peters (1966) and McCawley (1971) as precedents, she asserts the existence of an asymmetric and, which does not allow commutativity. She contrasts sentences like 1, which is symmetric, with sentences like 2, which she claims to be asymmetric:

1. What a night we had last night: the fuzz came in during the party, and the cat kept on dropping kittens into the punch bowl, and Mary screamed when Bill tried to abduct her, and the strobe light never did arrive.

2. Well, the story is as follows: The police came in, and everyone swallowed their cigarettes, and Bill choked on his, and they had to take him to the hospital, and his mother just about went frantic when she heard, and I had to placate her by lending her my copy of Portnoy's Complaint.
She says 'In a symmetric conjunction like [1] the members may change their respective order without changing either the grammaticality or the meaning of the sentence. This is not true with asymmetric conjunction.' (1971:127)

It is true that there is a strong felt implication that 2 imposes a temporal (G. Lakoff and Peters, McCawley) or a causal (R. Lakoff) ordering on its constituent clauses; moreover, this ordering is iconic, with the first clause in the sentence describing the first action in the sequence, and so on. But this implication is not an entailment.

Consider the following pair of sentences:

3. Harry robbed a bank, and he stole a car to make his getaway.

4. Harry robbed a bank, and before he did so he stole a car to make his getaway.

There is certainly a felt implication arising from 3 that Harry's robbing a bank preceded his stealing a car. But if this implication were an entailment, then 4 would be a contradiction, and 4 is not a contradiction. In general, examples which appear to entail a particular ordering of conjuncts depend heavily on the speaker/hearer's knowledge of the real world. Thus, most speakers find fragments like 5 to be unremarkable, but boggle at fragments like 6:

5. Speaker 1: Harry robbed a bank last week.
   Speaker 2: Yeah, and the cops arrested him.

   Speaker 2: ?Yeah, and he robbed a bank last week.

But the strangeness of 5 depends entirely on our knowledge
of the fact that, in general, people don't get arrested until after the crime for which they are busted occurs. It is not impossible, however, to imagine a situation to which that general knowledge does not apply. Suppose, for example, that a bunch of crooked cops had a dastardly scheme involving arresting innocent people on trumped up charges and forcing them to commit felonies to win their freedom (I see Clint Eastwood in the movie version). In such a situation, 6 would be a perfectly reasonable conversation for two of Harry's friends to have. Moreover, in such a situation, 7 would not be perceived as self-contradictory:

7. The cops arrested Harry, and then, last week, he robbed a bank.

I conclude that the ordering imposed by so-called asymmetric and is an example of what Boër and Lycan (1976:11) call theoretical implication, and not an example of an entailment.

R. Lakoff also appears to believe (there is a general equivocation here in her use of the word meaning) that an implication of causality is equivalent to an entailment of causality (1971:129). This, as I argue in Section 3.2, below, is not the case (see also Chapter VI and my discussion of discourse connectives and the maxim of strength). Thus, in discussing the following pair of sentences, she

8. The police came into the room and everyone swallowed their cigarettes.

9. Everyone swallowed their cigarettes and the police came into the room.
notes that if 9 is interpretable as containing an asymmetrical conjunction, 'it makes very different assumptions about causality than does [8].' This is quite plausible: inference by theoretical implication would yield different results about causality depending on the background knowledge the speaker brought with him to the task. For example, the knowledge that the cigarettes in question were marijuana, coupled with law enforcement officers' traditional bias toward this weed, support the assumption that the cigarettes were swallowed because the police came into the room. But the opposite causality might be assumed if, on the standard grounds of protecting people from their own vices, laws were passed prohibiting the swallowing of cigarettes. In that event, it's fairly easy to imagine a bunch of law officers lying patiently in wait to catch people red-handed (red-tonsiled?) in the act of swallowing their cigarettes and then swooping in to make the bust. But it is crucial to observe that neither sentence entails either assumption. Hence, her assumption that any notional difference between 8 and 9 must be expressed in 'underlying semantic representation' (1971:128) must be denied.

A further difference that Lakoff (1971:128) alleges to exist between symmetrical and asymmetrical and is that the first conjunct of a pair involving symmetrical and is asserted and hence can be denied 'without denying the validity
of the rest of the conjunction', but 'with asymmetrical and, the first member of the pair is presupposed, in order for the second to be meaningful'. In support of her claim, she maintains that denying the first conjunct of a sentence like 2 (viz., with a response like But the police didn't come in at all) 'renders [2] somehow nonsensical, the usual result in denying a presupposition'. But even granting that there are such things as presuppositions (in the sense she is using the term), it's not clear that such a phenomenon is apparent here. In fact the first conjunct of 2 can simply be omitted, with no loss of coherence:

10. Well, the story is as follows: everyone swallowed their cigarettes, and Bill choked on his, and they had to take him to the hospital, and his mother just about went frantic, and I had to placate her by lending her my copy of Portnoy's Complaint.

The only difference between 2 and 10, so far as I can see, is that 2 entails that the police came in and 10 does not. This seems to indicate quite clearly that the conjunct at issue is not presupposed by 2 and, in fact, has no special status at all. Again, the clear inference is that asymmetrical and has no semantic content not shared by its symmetrical counterpart.

Another potential difficulty for the claim that all discourse connectives identified as members of the class CONJUNCTION have the same semantic properties is posed by the connective but and other members of the subclass traditionally called adversatives (and so labeled in Table 1).
In discussing 'Semantic implications of coordination by but', Quirk et al. 1968:564-65 point out that

But denotes a contrast. The contrast may be in the unexpectedness of what is said in the second conjoin in view of the content of the first conjoin:

John is poor, but he is happy

The sentence implies that his happiness is unexpected in view of his poverty. The unexpectedness depends on our presuppositions and our knowledge of the world. It would be equally possible to say

John is rich, but he is happy.

if we considered wealth a source of unhappiness.

It is quite clear that Quirk et al. are using a much broader notion of semantics than the present work, since their notion includes background knowledge, the expectations of the speaker, the beliefs of the speaker in regard to the expectations of the hearer, etc., etc. There is no reason, of course, why Quirk et al. should not use any notion of semantics that they find useful. But if, as in the present work, we restrict ourselves to a truth conditional view of semantics, it is clear that but is semantically identical to and. As Gazdar and Pullum (1976:223) remark, 'no sentence p but q can be found which is false when p and q is true, or true when p and q is false, for any sentence p, q'.

One piece of evidence (not conclusive, because it ignores the differences between entailment and assertion) for this is that it appears impossible to deny any sentence containing but in favor of the same sentence containing and, or
vice versa:

11. Speaker 1: Ralph went to the movies, but Rachel stayed home.

Speaker 2: No, you're wrong: Ralph went to the movies and Rachel stayed home.

Yet it is possible to construct examples in which sentences containing or are denied in favor of those containing and:

12. Speaker 1: (Either) Ralph went to the movies or Rachel went bowling.

Speaker 2: No; Ralph went to the movies and Rachel went bowling.

Another piece of evidence that but and and are semantically identical lies in the fact that adversatives can be used to preface the denial of a preceding assertion, as in 13:

13. Speaker 1: I know perfectly well that you took the last brownie.

Speaker 2: But I didn't!

When this sort of thing happens, we would say, using ordinary language, that speaker 2 has contradicted speaker 1. The present analysis of but, which allows that 13 entails the formula \( K(P, -P) \), accounts for the fact that fragment 13 contains a contradiction and suggests that the use of the same term to refer to similar phenomena in logic and in ordinary language is not a coincidence. It is not clear how an analysis claiming a semantic difference between and and but would do this. A final piece of evidence is that it is often possible to substitute and for but, and vice versa, with no discernible semantic (or even pragmatic)
effects:

14. Ralph said I took the last brownie, \{and\} I didn't.
15. John is tall, \{but\} Bill is short.
16. John hates ice cream, \{and\} I like it.
17. John is tall, \{but\} he's no good at basketball.
18. John hates ice cream, \{and\} so do I.\(^3\)

This presumably would not be the case if but and and were semantically distinct.

Finally in this section, I would like to say something about the discourse connectives which I have identified as members of this semantic class, but which are not members of that subclass which have traditionally been referred to as coordinating conjunctions. These connectives, including such forms as, e.g., however, also, yet, and though, are in some sense asymmetrical, since it seems clear that they identify the first sentence of a discourse fragment as the given to which the second sentence is to be related. But this asymmetry has to do with something more like the functional sentence perspective of the Prague School than with anything truth conditional: the first fragment in each of the following pair is semantically, if not pragmatically, equivalent to the second:

19a. I've been an executive secretary for eight years. However, this is the first time I've ever been on the corporate end of things, working for the president.
b. This is the first time I've ever been on the corporate end of things, working for the president. However, I've been an executive secretary for eight years.

20a. I think it involves talent. Also, it involves a language that fewer and fewer people can speak.

b. It involves a language that fewer and fewer people can speak. Also, I think it involves talent.

21a. First thing comes to my mind is to shut my eyes just a few minutes. Yet I know I can't shut them for too long, I know I gotta get up.

b. I know I can't shut my eyes for too long, I know I gotta get up. Yet the first thing comes to my mind is to shut 'em just a few minutes.

22a. There was a camaraderie of sorts. It wasn't healthy, though.

b. It wasn't healthy. There was a camaraderie of sorts, though.

It is the pragmatic, conversational difference between these discourse connectives on the one hand and and and but on the other which create the syntactic differences described in the second section of Chapter II. And in cases such as 23, where one of these forms cooccurs with and or but, that form's only notional contribution to the fragment is, as far as I can tell, pragmatic:

23. ...I know I could never have taken that picture. Especially shooting off the flash in their face at the time. And yet I'm glad that he took that picture. (Working, p. 215)

Evidence that these forms do have the same semantic content as the conjunctions and or but can be found in the fact that such discourse connectives cannot cooccur with or, any more than and can cooccur with or:
24. If there's a bridge, you say, "I worked on this bridge." (Or you drive by a building and you say, "I worked on this building." (Cf. Working, p. 54)

The present analysis suggests that each of the above permutations will be equally bad, since each shares the same ill-formed semantic representation: roughly K(A(P,Q)).

3.2 CAUSATION (C)

In Section 2.2.2, above, I claimed that discourse fragments containing members of the class CAUSATION, such as so and because, allow extraction, entail that one proposition named in the fragment is a cause of the other, and do not allow commutativity. The claim that they allow extraction is of course equivalent to the claim that both sentences in a given fragment will be entailed by that fragment: that this is in fact the case can be shown by attempting to conjoin the denial of either of the sentences in such a discourse fragment to the fragment itself, as in the following:

25a. Harry lost the election. Because he's a republican.

b. *Harry lost the election. Because he's a republican. He won the election, though.

c. *Harry isn't a republican. But he lost the election. Because he's a republican.


The impossibility of 25b,c and 26b,c is due to the fact that all four of these fragments make contradictory assertions, and hence entail contradictions. This supports the claim that discourse fragments containing members of this class entail both sentences named in the fragments, since if they did not, these results would not occur.

The next claim to be developed is that the causal relation between the actions or states of affairs named in discourse fragments containing connectives of the class CAUSATION is entailed, rather than simply implicated, by those fragments. If this relation is entailed, then it should be possible to construct discourse fragments which have different truth conditions than the conjunction of the propositions named by them. And in fact most of us would probably accept all of the individual propositions named in 27 and 28, but would not be willing to accept the fragments themselves as being true:

27. The Carthaginians lost the second Punic War because Italy was a member of the Axis during World War II.

28. The melting temperature of ice is 32 degrees Fahrenheit. So the Pirates won the pennant in 1960.
Moreover, it is possible to challenge or deny the implication of causality within a discourse fragment directly, without challenging the individual propositions themselves:

29. Speaker 1: Did you say that the South lost the Civil War because Lee was a more talented general than Grant?

Speaker 2: No, I said that Lee was a more talented general than Grant and the South still lost the war.

30. Speaker 1: Kennedy is a democrat. So he will win in Vermont.

Speaker 2: No, you're wrong. He will win in Vermont in spite of the fact that he's a democrat.

According to Grice (1975:44-45), the imputation of causality arising from fragments containing connectives of this category is a conventional implicature: since it does not arise directly from 'what is said', fragments containing the causal connective therefore would not, 'strictly speaking', be false if it turned out that the two sentences contained in the proposition were true, but that one did not follow from the other. I will return to this point, and the question of conventional implicature and its relevance to discourse connectives in Chapter VI. For now, I will simply note that if the imputation of causality were a conventional implicature, then 27 and 28 would not, 'strictly speaking', be false. But they are false, since both have different truth conditions than the conjunction of their component sentences.
The third semantic property of these discourse connectives that I will address here is their asymmetry. Causality itself is asymmetric, and it isn't surprising that discourse connectives realizing the causal relation fail to allow commutativity: that, for example, 31 is not equal to 32, and 33 is not equal to 34:

31. Ignatz was liked by his teachers. Because he did well in school.
32. Ignatz did well in school. Because he was liked by his teachers.
33. Ignatz did well in school. So he was liked by his teachers.
34. Ignatz was liked by his teachers. So he did well in school.

What is more interesting, in the light of my claim that so and because realize the same semantic relation, is that 31 is not equal to 34 and 32 is not equal to 33. An explanation for this fact, based on the premise that all four of these fragments have different remote structures, is provided in section 5.1.0, below. For the present, I will simply assert that 31-34 have the following semantic representations, respectively (with \( C \) denoting the causal relation, \( K \) denoting conjunction, \( P \) denoting the proposition named by the sentence Ignatz was liked by his teachers, and \( Q \) denoting the proposition named by Ignatz did well in school):

31'. \( K(P,C(P,Q)) \)
32'. \( K(Q,C(Q,P)) \)
Given these semantic structures, together with the fact that \( C \) allows extraction, it is trivial to show that 31 equals 33 (since both 31 and 33 entail \( C(P,Q) \) by extraction, and since \( C(P,Q) \) entails both \( P \) and \( Q \)) and that 32 equals 34 (since both 32 and 34 entail \( C(Q,P) \) by extraction, and since \( C(Q,P) \) entails both \( P \) and \( Q \)).

3.3 EXAMPLE (E)

Discourse fragments containing connectives realizing the relation EXAMPLE, like those containing connectives realizing CAUSATION, allow extraction but not commutativity; the demonstrations of these properties are exactly parallel. Neither of the sentences in a fragment containing a connective realizing this relation, such as like, can be denied without at the same time denying the fragment itself. Thus both 35b and 35c are semantically anomalous, since both are self-contradictory:

35a. I just really was not conscious of what I was doin'. Like I been goin' to work in the mornin', when I go through the light, sometimes I know it and sometimes I don't. (Working, p. 238)

b. *I just really was not conscious of what I was doin'. Like I been goin' to work in the mornin', when I go through the light, sometimes I know it and sometimes I don't. But I just really was conscious of what I was doin'.

c. *...when I go through the light, I always know it. But I really was not conscious of what I was doin'.
Like, I been goin' to work in the mornin', when I go through the light, sometimes I know it and sometimes I don't.

Moreover, 36 is not equivalent to 37:

36. People are so careless anymore. Like yesterday I almost got run off the road by a semi.

37. Yesterday I almost got run off the road by a semi. Like, people are so careless anymore.

Fragment 36 implicates that the speaker's almost getting run off the road by a semi is a special case exemplifying the modern tendency toward carelessness; fragment 37 does not. Indeed, if 37 is interpretable at all, the like it contains must be interpreted as a narrative marker (see footnote, section 2.2.0). Evidence that it is not the same like as in 36 is that it can cooccur with and:

38. Yesterday, I almost got run off the road by a semi. And like, people are so careless anymore.

But (as is demonstrated in section 4.2.1) members of the semantic class EXAMPLE cannot.

In spite of the asymmetry of this relation, the ordering of the sentences within discourse fragments containing connectives realizing EXAMPLE is always first general, than particular. There is no connective, that is, which can replace like in 37 and make 37 equivalent to 36. The general implication of such fragments, then, is that the proposition named in the second sentence exemplifies a general claim made in the first. Evidence that this implication is in fact an entailment lies, as in the case of CAUSATION, in
the fact that fragments containing two true premises can be challenged if one is not in fact an example of the other:

39. Speaker 1: Hispanic-Americans have made significant contributions to our culture. Stonewall Jackson, for example, has long been studied for his brilliant small unit infantry tactics.

Speaker 2: No, you're wrong: Jackson was not an Hispanic-American.

Fragments like 39, in other words, have different truth conditions than otherwise similar discourse fragments containing either connectives of the class CONJUNCTION or no connectives at all. Moreover, although this is less clear, I would argue that discourse connectives of the class EXAMPLE cannot cooccur with realizations of the class CONJUNCTION because of this semantic difference.

3.4 ALTERNATION (A)

In section 2.2.4, above, I identified two discourse connectives as members of the class ALTERNATION: or and or else. I noted that there could be little doubt that the semantic properties of or are exhaustively described once it has been stated that discourse fragments consisting of two sentences connected by or entail the inclusive disjunction of the propositions named by them. As a result, discourse fragments like 40 can only be denied by the denial of both of their constituent sentences, as in 41. But 42 does not constitute a denial of 40.
40. They were either paying for a fantasy. Or they were paying for someone to listen to them.

41. No, you're wrong. They weren't paying for a fantasy. And they sure weren't paying for someone to listen to them. They just wanted their ashes hauled.

42. ?No, you're wrong. They weren't paying for a fantasy.

Nor does 43, which asserts that both of the propositions named by 40 are true, constitute a denial of 40:

43. ?No, you're wrong. They were paying both for a fantasy and for someone to listen to them.

The connective or appears to be no more than the lexicalization of the inclusive disjunction operator, A.

Discourse fragments containing or else also entail that one of the propositions named by them is true. But they also convey that no more than one of them is true—there is something strange about fragments like 44:

44. Jack likes cherry tarts. Or else he likes cheesecake. Or else he likes both.

In 2.2.4 I raised the question of whether or not this implication of exclusive disjunction by or else was an implicature or an entailment. But since there is no reason to believe that the or in 40 is any different from the or in or else, I take it that this question may be rephrased as follows: what sort of contribution does else make to discourse fragments containing it? For else can appear alone as a discourse connective, although one with a slightly archaic, inkornishish flavor (it did not appear in my sample
text). It is a member of the class CONDITIONAL EXCLUSION, and, having the same semantic interpretation as otherwise, can in general be substituted for it with no change in the truth conditions of the discourse fragment affected:

45. You'll have to know who I am, of course.
    {Otherwise}
    {Else}, there was no use in coming.

Similarly, otherwise can generally be substituted for else in the phrase or else with no change of truth conditions:

46. Then we'd go to bed. Or {else otherwise we'd start hacking away at our personal problems.

But there is no evidence that discourse fragments containing otherwise entail the exclusive disjunction of the propositions named by them. We wouldn't want to say that 45 is false if the hearer knew the identity of the speaker and it turned out that the speaker's coming was still of no use.

Nor, I think, would we want to call 46 false if it turned out that its speaker on occasion started 'hacking away' at his personal problems after he'd gone to bed. From this I conclude that the conveying of exclusive disjunction from fragments like 46 is an implicature.

But otherwise, else, and unless themselves all entail the inclusive disjunction of the propositions named by the discourse fragments containing them. That is, a discourse fragment containing a connective of the class ALTERNATION is false only if the propositions named by its constituent sentences are false, under which conditions fragments
containing connectives of the class CONDITIONAL EXCLUSION are also false.

But if otherwise and else themselves entail the exclusive disjunction of the discourse fragments containing them, then by definition they entail the inclusive disjunction of these propositions. Why, then, the semantically redundant or else and or otherwise? I have no conclusive answer to this question. However, in all the fragments containing otherwise that appeared in my sample, and in all the citations for the discourse connective else in the OED, either the sentence containing the connective was in the subjunctive, as in 47, or the preceding sentence to which the connective was anaphoric was either a subordinate clause or a sentence realizing some speech act type other than an assertion, as in 48 and 49, respectively:

47. Let's face it, a machine can do the work of a man. Otherwise they wouldn't have space probes. (cf. Working, p. 4. Some of these examples sound a bit odd with else, but only because of the archaic, and hence formal, style of else.)

48. I smile when I have something to smile about. Otherwise, I don't. (cf. Working, p. 382)

49. You have to wear a mask. Otherwise you can't stand it all. (cf. Working, p. 658)

The generalization is that at least one sentence in each discourse fragment containing else or otherwise is normally marked by some grammatical device as not asserted by the
proposition as a whole. When this is not done, as in 50, the resulting fragment can be a bit odd:

50. Ralph always drives a Ford. \(\{\text{Otherwise}\}\) he drives a Dodge.

But the occurrence of \textbf{or} within a discourse fragment also conveys the information that one of the propositions named by the fragment may be false, and hence that both sentences are not asserted. It thus performs a similar function in fragments like 51 as the devices listed above perform for 47-49.

51. Ralph always drive a Ford. Or \(\{\text{otherwise}\}\) he drives a Dodge.

3.5 \textbf{CONDITIONAL EXCLUSION (X)}

In section 2.2.5 I claimed that the two discourse connectives \textit{unless} and \textit{otherwise} shared the same semantic properties, and on the strength of this claim, I placed them in the same semantic class, which I labeled CONDITIONAL EXCLUSION. This relation is clearly asymmetrical, as can be seen in the following pairs of discourse fragments:

52a. Professor Arid will get tenure. Unless his book is rejected for publication.

b. Professor Arid's book will be rejected for publication. Unless he gets tenure.

53a. Professor Arid will get tenure. Otherwise, his book will be rejected for publication.

b. Professor Arid's book will be rejected for publication. Otherwise, he will get tenure.
Fragment 52a is not equivalent to 52b, nor is fragment 53a equivalent to 53b. Hence, the relation CONDITIONAL EXCLUSION does not allow commutativity. Nor does this relation allow extraction. If it did, denial of either of the propositions named by fragments containing unless or otherwise would constitute denial of the fragments themselves. But this is not the case: 56, which denies both propositions named in fragments 54 and 55, constitutes a denial of these fragments:

54. These might be the tracks of an Alsatian. Otherwise, the werewolf was in this room.

55. The werewolf was in this room. Unless those are the tracks of an Alsatian.

56. No, you fool: these are the pawmarks of Sally's pet hyena, and no werewolf could have gotten past the silver bars on the window.

But neither 57 nor 58, each of which denies only one of those propositions, constitutes a denial of the fragments in question:

57. ?No, those are the pawprints of Sally's pet hyena, which must have followed the werewolf into the room.

58. ?No, the werewolf never came into this room; it would have been frightened away by the Alsatian which left these tracks.

As far as the further semantic properties of these discourse connectives are concerned, Geis (1973) has argued convincingly that sentences like 59, which contain the sentential connective unless, have a semantic interpretation like 60:
59. Unless Professor Arid's book is rejected for publication, he will get tenure.

60. In any event other than that Professor Arid's book is rejected for publication, he will get tenure.

Moreover, notes Geis (1973:236), sentences like 59 'logically imply the truth of their corresponding if...not-sentences'. Thus, if 59 is true, 61 must also be true:

61. If Professor Arid's book is not rejected for publication, he will get tenure.

Since (as I argue in section 4.2.3, below) there is substantial evidence for identifying sentential unless with the discourse connective unless, and none for not so identifying it, we can reasonably claim that both uses of unless have the same semantic interpretation, and hence the same entailments. Thus 61 ought to be entailed by 52a, and indeed it is.

But what evidence is there that otherwise shares this same semantic interpretation, rather than (as Halliday and Hasan 1976:259 and Quirk et al. 1978:670 claim) that of if not? A number of the proofs used by Geis are not available for otherwise (e.g., since by the present analysis--see Chapters IV and V--there is no clause within the scope of the connective, there is no way of testing to see whether negative polarity items can occur within that scope, as Geis did in showing that unless clauses do not allow negative polarity items, and hence must be distinct from if...not clauses). It is possible to claim a paraphrase
relationship between fragments like 53a and 62 and argue that the former has been derived from the redundant 63 by deletion of the repeated sentence, and the latter from the same source by some sort of PRO-ing process:

62. Professor Arid will get tenure. Unless he does, his book will be rejected for publication.
63. Professor Arid will get tenure. Unless he gets tenure, his book will be rejected for publication.

But this claim is not conclusive. A more persuasive argument, cited in Warner 1978:3-4, runs as follows: If...not clauses can be conjoined to other if...not clauses, as in 64, but not to unless clauses, as in 65:

64. If Professor Arid doesn't stop assaulting coeds, and if he doesn't square the campus cops, he'll be arrested.
65. *Unless Professor Arid stops assaulting coeds, and if he doesn't square the campus cops, he'll be arrested.

Under Geis's analysis of unless, 65 is ungrammatical because it entails that the professor's cessation of assaults is the only way he can avoid arrest and at the same time he can avoid arrest by squaring the campus cops. It is thus a contradiction. Now consider 66 and 67:

66. Professor Arid must stop assaulting coeds. If not, and if he doesn't square the campus cops, he'll be arrested.
67. *Professor Arid must stop assaulting coeds. Otherwise, and if he doesn't square the campus cops, he'll be arrested.

Fragment 66 contains no such contradiction; it is fully as grammatical as 64. Fragment 67, however, is ungrammatical.
The claim that *unless* and *otherwise* realize the same semantic relation predicts this ungrammaticality, since it claims that 65 and 67 will both entail the same contradiction. This appears to be the case.

Finally, in this discussion of the semantics of the relation **CONDITIONAL EXCLUSION**, I would like to point out that no fragment listed in 52-53 is a paraphrase of any other fragment listed there. According to the present analysis, this is due to the fact that each of these fragments has a different remote structure. This claim is more fully developed in Chapters IV and V. For the present, however, I would like to indicate the distinct semantic representations which I consider to underlie each fragment. Letting \( t \) stand for the clause *Prof. Arid will get tenure*, \( p \) for the clause *Prof. Arid's book will be rejected for publication*, \( K \) for the **CONJUNCTION** relation, and \( X \) for the **CONDITIONAL EXCLUSION RELATION** (which is to be read 'a in any event other than that b' where a denotes the matrix clause and b the subordinate clause):

68. \( K(t,X(t,p)) \quad [ = 52a] \)
69. \( K(p,X(p,t)) \quad [ = 52b] \)
70. \( K(t,X(p,t)) \quad [ = 53a] \)
71. \( K(p,X(t,p)) \quad [ = 53b] \)

This is not the position I espoused in Warner (1978). According to the analysis I presented there, 52a was a paraphrase of 53b, and 52b was a paraphrase of 53a, with the
following semantic representations:

72. $X(t,p) \equiv 52a, 53b$

73. $X(p,t) \equiv 52b, 53a$

By this analysis, fragments containing otherwise are derived from the same structures that underlie unless sentences by an extraposition rule which removes the subordinate clause to the left, and out from under, so to speak, the connective. Thus, for example, 74a and b would be derived from the same underlying structure, with 74b, but not 74a, undergoing the extraposition rule:

74a. Unless Professor Arid stops assaulting coeds, he'll be arrested.

b. Professor Arid must stop assaulting coeds. Otherwise, he'll be arrested.

But there are at least two reasons why this analysis must be rejected. First, it is not at all clear that 74a and 74b are paraphrases: the intuitions of native speakers are not consistent on this point. There are, however, cases for which this analysis predicts paraphrase relationships which clearly do not exist. For example, 76 is not a paraphrase for 75, since 76 entails that the speaker gave John a cookie and 75 does not:

75. Unless I had given John my cookie, he would have broken my nose.

76. I gave John my cookie. Otherwise, he would have broken my nose.

(Some speakers, I should point out, reject 75 as a possible sentence. For these speakers, fragments like 76 do not
appear to have analogous unless sentences which are even candidates for paraphrasis.) Also, discourse fragments like 77 can be found which cannot be related to any unless sentence by the extraposition analysis:

77. I smile when I feel like it. Otherwise, I don't.

By the extraposition analysis, these sentences could only be generated from something like the following:

78. *In any event other than that in which I smile when I feel like it, I don't (smile).

But this is clearly impossible: it's hard to imagine what 78 could mean, but even if it were possible to say this sentence, it clearly does not paraphrase 77.

3.6 HEDGE (H)

In section 2.2.6 I stated that discourse fragments containing members of the class HEDGE, such as at least, allow neither extraction nor commutation. This is not to say that one or both of the sentences contained in such fragments are false. Indeed, in a large number of cases, such as 72, both sentences would probably be generally accepted as true:

79. Nixon wasn't the best president this country has ever had. But at least he hasn't been convicted of any felonies yet.

But the truth of such sentences is not a function of the connective itself. This is illustrated by fragments like the following:
80. Next year, we're all going to have to pay more federal taxes. At least, we will if Senator Kennedy has his way.

81. There are no irrational numbers. At least, that's what Professor Dumdum believes.

82. They treat him [the migrant worker] like a farm implement. In fact, they treat their implements better and their domestic animals better. (Working, p. 36)

In all three cases, the second sentence is entailed by the fragment as a whole. But is the first sentence entailed? Literally, of course, it is not: fragment 73 doesn't assert that a rise in federal taxes is inevitable, but that it is contingent on Sen. Kennedy's having his way, and 74 names a proposition which may be true in the professor's mind, but not necessarily in the speaker's. And the first sentence of 75 is also inconsistent with the second--to be treated like something is not the same as to be treated better than something.

But it's not clear that we want to assert that any of these sentences are false, exactly. Compare 82, for example, with 76:

83. *They treat him better than a farm implement. In fact, they treat their implements better and their domestic animals better.

In 83, the two sentences are mutually contradictory, with or without the occurrence of in fact, and the fragment as a whole is semantically anomalous. This is not the intuition we have with regard to 82, which is quite unremarkable.
The only way out of this dilemma, I suggest, is to say that the first sentences of discourse fragments containing connectives of the class HEDGE are sort-of-true: not as true as their second sentences, but not as false, say, as the first sentence of 83. At this point the variance between my use of the term sort-of-true (and hence of HEDGE) and that of Lakoff (1972) will become clear. I am using sort-of-true to mean roughly, true within a particular frame of reference, or context. These contexts are of several dissimilar types: the relevant context for 80, for example, is the real world as it would be if Kennedy 'had his way'; for 81 the context is the system of beliefs held by Professor Dumdum, and the speaker has committed himself to the position that within that context, irrational numbers have no reality. And for 82, the relevant context is one in which the phrase like a farm implement is understood to mean 'as badly as a farm implement', since migrant workers have, as human beings, rights to be treated with respect and consideration not shared by farm implements, and to be treated like farm implements is to be treated without this respect and consideration. And in that context, we would expect 83 to be anomalous; if 83 is anomalous in isolation, it is presumably because the context which it expresses clashes with that defined by our own systems of belief.
3.7 **COMPARISON**

Discourse fragments containing comparative *like*, the one connective realizing the COMPARISON relation in my sample, are like those discussed in the preceding section, in that they allow neither simplification nor commutativity. They are hence deceptive, since similarity, the semantic property most like that expressed by this relation, is symmetrical. But as noted in 2.2.7, only the proposition named in the first sentence of such fragments as 83 and 84

83. That's the worst thing, the way they treat you. Like you have no brains. (Working, p. 38)

84. And you hear the tear gas....Like you're playing, fooling around with death. (Working, p. 746)

is entailed. In fact, there is no evidence that the second sentences name propositions which the fragments contain as implicatures.
Notes

1. This is an extremely modest claim since, as I point out in Chapter VI, a discourse fragment containing no discourse connective will, ceteris paribus, have the same entailments as a discourse fragment differing from it only by the presence of a discourse connective of this class. That is, a fragment like i will be true if and only if ii is also true:

i. We all went to the bar last night. After we'd been there for an hour, we got bored and left.

ii. We all went to the bar last night. {But} after we'd been there for an hour, we got bored and left.

Hence, i is neither weaker nor stronger than ii. CONJUNCTION seems to be the only relation between sentences which can be entailed by this sort of asyndetic discourse connection. (But cf. Quirk et al. 1978:550–51.)

2. A difficulty which Lakoff ignores here is the question of the associative properties of asymmetrical and. She discusses only the first and second conjuncts of sentences like 2. But what about the third and succeeding conjuncts? Is the only conjunct asserted by the sentence the last one? In her description, does the third conjunct presuppose the first, the second, or the conjunction of the first and second? If the conjunction of both, is the connective to be interpreted as symmetrical or asymmetrical? If the latter, we will need to countenance not only presuppositions but presuppositions of presuppositions. If the former, we will need to account for how conjunction can take place between two dissimilar speech act types in just these cases, and not in cases like

*Are you leaving and shut the door.

These problems, and others even hairier, are avoided by the position that, from a semantic point of view, there is only one and, and that it is symmetrical.
Examples 15-18 are adapted from R. Lakoff 1971:133. In support of my present argument, I might mention her observation that but, like and, occasionally shows asymmetric properties like those discussed above. If and and but are semantically distinct, there is not reason but coincidence that these connectives, but not or, are subject to this particular form of theoretical implication.

Members of this category also have an expository use which expresses a relation between the logical structure underlying one sentence within a fragment and the speech act expressed by the other. Thus for example, in the following the state of affairs expressed by the first sentence causes the speaker to make the request expressed by the second:

I'm cold. So please shut the window.

And in this example, the state of affairs expressed by the second sentence is at least a contributing cause to the speaker asking the question expressed by the first:

Are you going to keep your date with Prunella tonight? Because her husband is back in town.

These connectives also have what could be described as an epistemic use, where the relation is between a belief and the fact which causes the speaker to hold that belief:

(I believe that) Seven \{is \text{must be}\} odd. Because it's a prime number.

Seven is a prime number. \{So \text{Therefore}\} it \{is \text{must be}\} odd.

Both these uses, I believe, are derivative of the one described in the text, which I take to be the primary sense of these connectives.

That this lack is not accidental is suggested by the fact that, as far as I can tell, the same conditions hold for a number of languages, including Turkish, Latin, Russian, German, and French. I know of no languages where they do not hold. It would be interesting to ascertain if there are any languages (ergative languages, perhaps) where they do not hold or, even more interestingly, where the converse conditions hold.
Bill Lycan has suggested to me that in fact also has the Gricean function of marking a violation of the Maxim of Quantity by indicating the speaker's belief that a stronger claim than that made by the preceding sentence is possible. Although the first sentences of all the examples of this connective I found all seemed to have the characteristic sort-of-true property, it may well be that this is the principal conversational function of this connective. If so, we have an interesting contrast between this connective, which indicates that the preceding contribution was not strong enough, and the others identified as members of this class, since they indicate that the previous contribution was too strong in terms of the Maxim of Quality and hence had to be hedged since the speaker lacks sufficient reason to believe that it is literally true.
Chapter IV

THE SYNTACTIC STRUCTURE OF DISCOURSE FRAGMENTS

4.0 Introduction

In the previous chapters, I have given arguments in support of the claim that discourse connectives realize semantic, as well as pragmatic, relations between sentences. In this chapter, I will be arguing that discourse connectives also realize syntactic relations between sentences. First, I will demonstrate that discourse fragments satisfy a number of standard tests for constituency, and hence ought to be considered as syntactic units. Next I will describe the various discourse connectives in terms of the paratactic and hypotactic relations which they realize between the coconstituents of their matrix discourse fragments. Finally, I will present what I consider to be the surface structures of the different types of discourse fragments. These structures will be expressed by labeled trees which differ from conventional syntactic trees only in having a root node labeled F (for discourse fragment) instead of S (for sentence). The significance of this difference in labeling will be discussed in section 6.1, below.
4.1 Arguing for constituency

Zwicky (1978) provides a brief survey of the various kinds of evidence traditionally used to support claims of constituency. In this section, I will argue that a number of these tests support the claim that discourse fragments of the type I have been discussing do in fact form constituents. The obvious implication of such a claim is that there is some suprasentential level of syntactic structure, upon which such fragments can be syntactic constituents.

4.1.1 Semanticity

The first criterion for constituency, semanticity, has already been alluded to. Zwicky notes (1978:504) that 'what are traditionally regarded as constituents tend to have semantic unity'. We have already seen that the semantic interpretation of discourse fragments is truly compositional and not (except, of course, in the case of CONJUNCTION) simply additive—that is, that the semantic interpretation of a given discourse connective is not just some combination of the truth values of the two sentences it connects. Indeed, sentences like the following cannot be assigned truth values in isolation, any more than (for example) a verb phrase can be:

1. Otherwise, pigs would lay eggs.
2. Not because all Mary's hair fell out.
3. So the elephants got restless.
4. Or else the republicans would have won.

Each of the above sentences, it is true, contains a clause which could be assigned a truth value. For example, pigs don't lay eggs, Mary's hair may or may not have fallen out, the elephants may have become upset or not, and the republicans may have won, lost or drawn. But that's not equivalent to saying that the sentences themselves have truth values. Sentential objects and complements likewise contain clauses which could be assigned truth values. Yet nobody would claim that constituents like the following have truth values:

5. concern that pigs lay eggs
6. the fact that all Mary's hair fell out
7. observed that the elephants got restless
8. her belief that the republicans would have won

But each of the sentences 1-4 can occur as the second constituent of a discourse fragment. When it does, as in 9-12, respectively, we find that the truth value of the discourse fragment as a whole is at most only partially or contingently dependent on the truth value of those sentences.

9. Pigs are viviparous. Otherwise they would lay eggs.
10. Harry recently started dating Yetta. But not because all Mary's hair fell out.
11. The peanuts weren't delivered until midnight. So the elephants got restless.
12. Their candidate must have been a real yo-yo. Or else their candidate would have won.
For example, since pigs don't lay eggs, 9 is true only if pigs are viviparous. Fragment 10 can be true whether Mary is suffering from alopecia totalis or not. For 11 to be true, three conditions have to be met: the peanuts must have been delivered no earlier than midnight, the elephants must have gotten upset, and the second state of affairs must have been caused by the first. And in 12, the fragment itself is true only if the candidate was a real yo-yo and he lost. Thus, although sentences 1-4 have no truth values of their own, they do make a contribution to the truth values of the discourse fragments in which they occur.

4.1.2 Distributional facts

There exist a number of distributional facts which can only be described by appealing to the discourse fragment as a level of suprasentential syntactic organization. One such fact, which has to be accounted for by any theory of discourse connectives, is the privilege of occurrence of these connectives. They occur as constituents of sentences, to be sure. But they cannot appear in just any sentence. For one thing, they only can appear in sentences which are proper constituents of some discourse fragment: because discourse connectives realize binary relations, examples like 1-4, consisting only of a single sentence containing a discourse connective, are not possible discourse fragments. (It is crucial to note, however, that 1-4 are perfectly
grammatical as proper constituents of discourse fragments: otherwise, fragments 9-12 would be anomalous, and they aren't.) Nor can discourse connectives appear within the first sentence of a pair within a discourse fragment. That is, there is no connective (at least in English) which could be substituted for C in 13-16 to provide a well-formed discourse fragment:

13. *Pigs are viviparous C. They would lay eggs.
14. *Harry recently started dating Yetta C. All Mary's hair fell out.
15. *The peanuts weren't delivered until after midnight C. The elephants got restless.
16. *Their candidate must have been a real yo-yo C. Their candidate would have won.

Moreover, there is no position within the first sentence of any of the above which would allow such a substitution.

One class of potential counterexamples to this last constraint are cataphoric expressions like as follows. E.g.:

The directions are as follows: take I-71 South to I-70 West...

But such expressions are not discourse connectives. They are like discourse connectives in that they too are (in the sense developed by Halliday and Hasan 1976) devices of cohesion. But they are in fact no more than PRO-forms for the expressions following them. They do not express syntactic or semantic relations between constituents: they merely act as place holders for constituents within the sentences
that contain them. Thus, the above example could be paraphrased by any of the following:

17. The directions are to take I-71 South to I-70 West,...
18. These are the directions: take I-71 South to I-70 West...
19. The following are the directions: take I-71 South to I-70 West...
20. Here are the directions: take I-71 South to I-70 West...

(Cf. Halliday and Hasan 1976:17— one of the few places where they discuss cataphora. In passing, I might mention that, in their discussion of CONJUNCTION— or, in my terminology, discourse connectives— they fail to mention any cataphoric forms.)

One way of accounting for the apparent impossibility of discourse fragments comprising only one sentence containing a discourse connective might be to appeal to the anaphoricity of some discourse connectives. The argument might run as follows: sentences containing anaphoric discourse connectives (such as 1 or 2) are, from a logical point of view, open sentences, since each of them contains (at some level of structure) an indexical expression to which no denotatum is assigned. Until such an assignment is made (viz., by the discourse context), such sentences lack a determinable truth value. But this does not make them ungrammatical, any more than it makes sentences like 21, which also lacks a determinable truth value, ungrammatical:
21. He's the one who shot Lincoln.

Such an approach has its appeal. For one thing, it would explain why anaphoric discourse connectives never appear in the sentences to which they refer. For, if the connective appeared in that sentence, it would be anaphoric to the syntactic constituent which contained it. But this sort of autophoric reference does not, as far as I know, occur in any way in any natural language. This approach would also, at least at first glance, appear to account for the fact that it is only the second sentence of a given discourse fragment to which the connective may be attached. This argument would depend on the observation that the referent of any anaphoric element must appear in a constituent which either precedes or unilaterally commands that element. But, as I demonstrate in the second section of this chapter, there are no cases where the second sentence of a discourse fragment (which surely does not precede the first) unilaterally commands the first; in cases of hypotaxis, it is always the preceding sentence which unilaterally commands the first. Hence, runs the argument, the anaphoric discourse connective could never precede its referent, and must therefore attach to the sentence following.

This approach turns out to be an oversimplification, however: the distributional behavior of discourse connectives cannot be explained under the assumption that such connectives are no more than special cases of cross reference
within discourse. For one thing, discourse connectives appear more highly constrained than other cross-referential elements. English, like other languages, exhibits a number of kinds of cataphoric reference in discourse (cf., e.g., Halliday and Hasan 1976:17 et passim, Quirk et al. 1978: 701-02). So, if discourse connectives were no more than instances of cross reference within discourse, we would expect to find cataphoric, as well as anaphoric, discourse connectives. But, as noted above, there are no cataphoric discourse connectives in English.² (This absence of cataphoric discourse connectives is even more striking in an SOV language like Turkish, which in general allows much more cataphora than English—gapping to the left, the pro-AUX, -ip, which appears in the leftmost of two coordinate clauses, prepositive relative clause analogues, etc. But the translation equivalents of the discourse connectives I have been discussing— which Swift 1962:182-83 lists as members of the substitution class utterance conjuncts— attach to the rightmost of the two relevant sentences or clauses.)

Moreover, even if discourse connectives did behave in all respects like other kinds of anaphora, the appeal to anaphoricity would still leave certain key phenomena unexplained. For one thing, merely stating that a command/precede constraint on anaphora applies to discourse connectives fails to explain why the second sentence of a discourse fragment never unilaterally commands the first. There is,
after all, no obvious reason why this distribution, which never occurs, should be any rarer than its converse, which does. Also, the distributional facts ascribed to these anaphoric connectives also hold for connectives which, like \textit{and}, \textit{or}, or \textit{but}, cannot reasonably be considered anaphoric. It is presumably not accidental that all discourse connectives exhibit the same characteristics, but an appeal to anaphora would, by precluding a maximally general account of these characteristics, force us into the position that such similarity was accidental.

In my opinion, no purely formal explanation for these distributional facts is possible. What appears to be going on here is the instantiation of a general conversational strategy. Discourse connectives are, after all, grammatical devices for signaling relevance between sentences. But once a sentence or a sequence of sentences is uttered, it is immutable. If any further sentence relevant to that sentence or sequence of sentences is to be uttered, it is the succeeding sentence which must be adapted to signal its relevance to the preceding utterance, for it is the preceding utterance which establishes the universe of discourse to which the succeeding sentence may be relevant. (For further discussion of how discourse connectives interact with general conversational principles, see Chapter VI.) But in any event such a conversational explanation is beyond the scope of the present section. The crucial point here
is that even a description of these facts necessitates an appeal to some suprasentential constituent: viz., the discourse fragment.

4.1.3 Interruptability

A third characteristic of constituency noted by Zwicky (1978:505) is that constituents tend not to be interruptable. In general, the tighter the bond between elements within a constituent, the more resistant these elements are to interruption. And, if we attempt to interrupt fragments like the following

22. Professor Arid must stop assaulting coeds. Otherwise, he'll be arrested.

by inserting some third sentence, we find that the bonds between the sentences in this fragment strictly limit the kinds of material which can be inserted. Consider, for example, the following elaborations of 22:

23. *Professor Arid must stop assaulting coeds. His wife is getting upset. Otherwise, he'll be arrested.

24. Professor Arid must stop assaulting coeds. (And) he better stop brewing beer in his basement, too. Otherwise, he'll be arrested.

Fragments like 22 can only be interrupted by some third sentence if that third sentence is interpreted as being conjoined to the first sentence in the fragment, as in 24. When the conjunction interpretation is impossible, as in 23, the resulting fragment is ill-formed. Also, note that the juxtaposition of the first two sentences in 23—without
and--is perfectly well formed. It is only when the sentence containing otherwise is also present that the fragment is ill-formed.

Except for cases like 24, which involve conjoined sentences, only parenthetical sentences can, in general, appear between the two sentences of a discourse fragment. And even the appearance of parenthetical material is uncommon: of the approximately 1890 discourse fragments which I identified in my sample text, Working, only seven contained material of this kind. These seven included the following fragments, as well as one containing where (EXAMPLE), two containing also, and one additional example containing yet:

25. But I still feel hypocritical about my work. (I suspect people in the business world have to stay away from thoughts like that.) Yet there are things I feel pretty good about. (Working, p. 732)

26. Even when they pinch us or say dirty things, we're supposed to smile back at them. (That's one thing they taught us at stew school.) Like he's rubbing your body somewhere, you're supposed to just put his hand down and not say anything and smile at him. (Working, pp. 78-79)

27. As we walk out, our pictures are taken again. (Red Squad, Chicago Police Department.) Because we represented the Young Patriots. (Working, p. 696)

These parenthetical remarks, which I have set off in the above examples by parentheses, can be deleted from their fragments with no loss of coherence. Moreover, they do not appear to block the relation obtaining between the first and third sentences of their fragments, and it is not clear what
semiotic relationships obtain between them and their fragments, taken as units.

4.1.4 Anaphoricity

The final criterion for constituency that I will mention here is anaphoricity. The generalization, stated by Zwicky (1978:506), is that 'only subparts that make constituents can be substituted for by anaphoric elements such as proforms and zeros.' But discourse fragments can be substituted for a wide range of such elements. Consider, for example, the following cases:

28. Speaker 1: Carter better come out with a coherent energy policy. Otherwise, he'll lose his last chance at renomination.
   Speaker 2: Where on earth did you hear that?
   Speaker 1: J.P. Throttlebottom said it last night on the evening news.

29. OK, team, this is what I want you to do. Jerry, if you can get loose drop down for a pass. But otherwise, I'll hand off to Fred.

30. Speaker 1: Billy! Did you finish washing the dishes? And did you take out the garbage?
   Speaker 2: Yes, I did.

In the first example, there are two proforms referring to the fragment which composes speaker 1's contribution: that and it. That these forms do refer to the fragment as a whole can be shown by considering the following as speaker 1's response to speaker 2's question:

31. Speaker 1: Well, J.P. Throttlebottom said it last night on the evening news, and Jackson has said that
   \{ Carter better come out with a coherent energy policy \}
   \{ otherwise, he'll lose his last chance for renomination. \}
In the context of 28, this is not a possible answer. In example 29, on the other hand, the proform is *this*, a cata-
phoric proform which refers to the CONDITIONAL EXCLUSION
describing the speaker's game-plan. And in the final exam-
ple, we have a case of zero anaphora involving VP deletion.
Note that Billy would have a hard time arguing that his
answer did not commit him to the position that he'd finished
both chores: in effect, that the VP deleted from his reply
was not *finish washing the dishes and take out the garbage.*
Examples like these, I am convinced, provide extremely
strong evidence that discourse fragments do, in fact, form
constituents.

4.2.0 Hypotaxis vs. parataxis

In this section, I will be examining the syntactic
properties of various discourse connectives in further de-
tail. I have already given reasons for believing that the
two sentences of a given discourse fragment ought to be
considered co-constituents of that fragment. Here I will
be concerned with the relationships between these sentences
as they are realized by a representative sample of dis-
course connectives, drawn from each of the semantic cate-
gories stated in Chapter II and motivated in Chapter III.

Specifically, I will be applying various tests to
determine which discourse connectives realize a paratactic,
or coordinate relationship between the constituent sentences
of these fragments, and which realize a hypotactic relationship (in which one sentence is subordinate to the other). There are five of these tests: the first two have to do with the cooccurrence of and (or but) and of not with the various discourse connectives; the last three are concerned with some similarities between sentences containing hypotactic connectives and certain adverbial clauses. (The results of these tests are summarized in Table 2.) The section will close with some remarks regarding the fit between hypotaxis (i.e., syntactic asymmetry) and semantic asymmetry, and a discussion of the inability of the tests used here to shed any light on the syntactic contributions made by discourse connectives of certain semantic classes.

4.2.1 Cooccurrence with and

One natural test for parataxis between two constituents is their potential for being conjoined with either and or its lexical variant, but. For such conjunction to take place, two requirements must be met: the constituents must be of the same type (i.e., you can't conjoin nouns and verbs, or questions and orders) and they must be at the same level of dependency (in terms of their hierarchial structure, they must both be immediately dominated by the same node). Moreover, failure to meet these requirements at any point during the derivation will block conjunction. Thus 1, which conjoins two statements, is possible; 2, which conjoins
### TABLE 2

**SUMMARY OF RESULTS OF TESTS FOR PARAXIS AND HYPOTAXIS**

<table>
<thead>
<tr>
<th>Connective</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CONJUNCTION</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>and, but</td>
<td>N/A</td>
<td>0</td>
<td>X</td>
<td>X</td>
<td>Ø</td>
</tr>
<tr>
<td>however, also</td>
<td>X</td>
<td>0</td>
<td>X</td>
<td>0</td>
<td>Ø</td>
</tr>
<tr>
<td>yet</td>
<td>X</td>
<td>0</td>
<td>X</td>
<td>X</td>
<td>Ø</td>
</tr>
<tr>
<td>though</td>
<td>X</td>
<td>0</td>
<td>X</td>
<td>Ø</td>
<td>X</td>
</tr>
<tr>
<td><strong>ALTERNATION</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>or, or else</td>
<td>N/A</td>
<td>0</td>
<td>X</td>
<td>X</td>
<td>0</td>
</tr>
<tr>
<td><strong>CAUSATION</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>so</td>
<td>X</td>
<td>0</td>
<td>X</td>
<td>X</td>
<td>Ø</td>
</tr>
<tr>
<td>because</td>
<td>0</td>
<td>X</td>
<td>0</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>CONDITIONAL EXCLUSION</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>otherwise</td>
<td>X</td>
<td>0</td>
<td>X</td>
<td>Ø</td>
<td>Ø</td>
</tr>
<tr>
<td>unless</td>
<td>0</td>
<td>X</td>
<td>0</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>COMPARISON</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>like</td>
<td>Ø</td>
<td>X</td>
<td>0</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>EXAMPLE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>like, for one thing</td>
<td>Ø</td>
<td>Ø</td>
<td>X</td>
<td>?</td>
<td>Ø</td>
</tr>
<tr>
<td><strong>HEDGE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>at least</td>
<td>Ø</td>
<td>Ø</td>
<td>X</td>
<td>?</td>
<td>Ø</td>
</tr>
</tbody>
</table>

**KEY:**  
T1...potential for conjunction  
T2...potential for negation  
T3...cooccurrence with inversion  
T4...restriction to sentence initial position  
T5...preposability

N/A...'test inapplicable'  
X...'results of test positive'  
Ø...'results of test negative'
a noun phrase and an infinitive complement, is not:

32. John wanted to be happy and he wanted a beer.

33. *John wanted to be happy and a beer.

Sentence 3, which conjoins sentences at different levels of dependency, is impossible, even though the sentences are constituents of the same type:

34. *That rug is a Shiraz (,) and which I bought at an auction.

Thus, for two sentences to be conjoined by and or but within the same discourse fragment, both the like constituent constraint and the parataxis constraint will have to have been satisfied.

Given these facts about conjunction, this test for parataxis appears to be the most reliable and intuitively satisfying. By it, the following members of the semantic class CONJUNCTION are shown to realize paratactic relationships between the sentences of the discourse fragment: and, but, yet, and also. This is illustrated by the following fragments:

35. I'll probably be worse than all of them. And yet I can't stand them. (Working, p. 615)

36. [stewardesses are] gonna get wrinkles all over their face because they smile with their mouth and their eyes. And also with the pressurization on the airplane, we're not supposed to get up while we're climbing because it causes varicose veins in our legs. (Working, p. 81)

Neither and nor but can be added to discourse fragments already connected by these forms. However, the fact that
these connectives can occur between two sentences within a discourse fragment in the first place is evidence that they are in a paratactic relationship with each other. This judgment is supported by the fact that all the other tests described in this section identify the relationship expressed by these connectives are paratactic. Two other members of this class, though and however, can also cooccur with conjunction. But, as Quirk et al. (1977:529) point out, they 'cannot follow the conjunction immediately' but must occur in other than sentence initial position. They cite the following examples:

37. He doesn't eat very much, but he looks healthy though.

38. You can phone the doctor if you like, but I very much doubt, however, whether you will get him to come out on a Saturday night.

No examples of this cooccurrence phenomena were attested in Working; however, given the low incidence of though and however in the sample (though appeared three times in other than sentence initial position, and however not at all) this isn't surprising.

As regards realizations of the ALTERNATION relation, neither or nor or else can cooccur with and or but. However, this is not evidence that sentences linked by these discourse connectives are hypotactically related. (In fact, according to the other tests, these connectives are paratactic. See below.) It is due instead to the more general
fact that lexicalizations of the ALTERNATION relation are in complementary distribution with those realizing the CONJUNCTION relation. Thus 39b is impossible for the same reason that 40b is impossible:

39a. He realizes his life doesn't end when he gets a job. Or when he gets married, his life doesn't end. (Working, p. 641)

b. *He realizes his life doesn't end when he gets a job. \{And\} or when he gets married, his life doesn't end.

c. He realizes his life doesn't end when he gets a job. And when he gets married, his life doesn't end.

40a. These people think they're great, paying for more, and want more. Also I get tired of coach passengers asking for something that he thinks he's a first class passenger. (Working, p. 77)

b. *These people think they're great, paying for more, and want more. Or I also get tired of coach passengers asking for something that he thinks he's a first class passenger.

c. These people think they're great, paying for more, and want more. Or I get tired of coach passengers asking for something that he thinks he's a first class passenger.

It's worth pointing out that there is nothing in the sentences of 39 themselves to preclude their being related by conjunction, nor is there any reason why the sentences in 40 can't be related by ALTERNATION. (This is illustrated by 39c and 40c.) Thus, if 39b and 40b are impossible, it can only be due to the interaction of the incompatible connectives.
Thus far, all of the connectives tested have proven (insofar as they have been susceptible to this test) to be paratactic. In the next two semantic categories, however, we find both hypotactic and paratactic realizations of the relation. *Because* and *so*, for example, are both realizations of the semantic relation CAUSATION. The latter, however, can cooccur with *and*; the former cannot:

41. When I finished my education I knew I wanted to get into union work. (*And) so I started doing work in different factories, making contacts--non-union shops. (*Working, p. 684*)

42. The heat in the summer almost kills me. (*And) because there you are under a glass roof where everything is magnified. (*Working, p. 667*)

A similar pattern emerges with the two members of the class CONDITIONAL EXCLUSION: *otherwise* can cooccur with *and*, but *unless* cannot:

43. That's money because it's mine. (*But) otherwise it doesn't really mean anything. (*Working, p. 346*)

44. If you hit a person's logic, you've got 'im. (*But*) unless you've got a dingaling. (*Working, p. 303*)

It is surprising that in spite of the large number of occurrences of *so* and the reasonable number of occurrences of *otherwise*, no cases were attested in the sample where either of these connectives cooccurred with conjunction. However, the potential for conjunction is the basis for this test for parataxis; whether or not this option is commonly used is not at issue.
None of the remaining three categories of discourse connectives identified in the second section of Chapter II cooccurred with conjunction in the sample. Moreover, of the connectives found in the sample, none realizing relations of these types can cooccur with conjunction. Fragments 45b, 46b, 47b, and 48b illustrate what happens when connectives realizing relations of the categories EXAMPLE (45a and 46a), COMPARISON (47a) and HEDGE (48a) are collocated with conjunctions:

45a. He was bad news. Like he'd never eat because he thought he'd have to pay for it and he didn't have the money. (Working, p. 619)

b. He was bad news. *(And) But* like he'd never eat because he thought he'd have to pay for it and he didn't have the money.

46a. Yeah, I prefer laboring to bookkeeping. For one thing, a bookkeeping job doesn't pay anything. (Working, pp. 150-51)

b. Yeah, I prefer laboring to bookkeeping. *(And) But* for one thing, a bookkeeping job doesn't pay anything.

47a. Yet you ask a question a lot of times and you don't get the answer you need. Like he doesn't listen. (Working, p. 345)

b. Yet you ask a question a lot of times and you don't get the answer you need. *(And) But* like he doesn't listen.

48a. I was glad to be a cog in the wheel. At least it wasn't humiliating. (Working, p. 666)

b. I was glad to be a cog in the wheel. *(And) But* at least it wasn't humiliating.
Since these connectives don't cooccur with conjunction, there is no evidence that the syntactic relations they realize are paratactic. But this doesn't force us to assume that those relations are hypotactic: after all, there are a number of syntactic relationships (e.g., those between subject and predicate, or between adjective and noun) that are paratactic but do not allow conjunction. Moreover, the other tests discussed in this section fail, as we shall see, to give any clear evidence that the relations in question are hypotactic.

4.2.2 Parataxis and negation

We have seen that potential for cooccurrence with conjunction, in spite of its intuitive plausibility as a litmus for parataxis, fails to give us unambiguous results for a number of connectives. In this section, I propose a test which gives much more satisfying results: it applies to all the discourse connectives under discussion, for example, supports the clear cases of parataxis identified by the conjunction test, and in general provides a much closer fit with our pretheoretical judgments on which discourse connectives appear to signal a paratactic relationship within the discourse fragment, and which appear to signal a hypotactic relationship. Yet there is no obvious reason why this test should work this well. (It turns out that there is a very straightforward explanation of why it
works, however. This reason, which depends on certain facts having to do with the underlying and superficial structures assigned to the discourse fragments, is discussed below in section 5.3).

The test I allude to depends on the fact that only discourse connectives realizing a hypotactic relation between the sentences of a discourse fragment can be preceded by *not*. Thus, none of the connectives which, according to the conjunction test, realize paratactic relations can fall within the scope of negation; when we attempt to negate them, the results are impossible:

49. My old man didn't finish high school. *Not yet 
   {however} he reads all the time.

50. I didn't think I ever worked on anything I thought was terrible, really. (*Not) though I didn't think there was that much difference between Wildroot and someone else's shampoo. (Working, p. 699)

51. I didn't think I was really good for anything. (*Not) so I kind of drew back. (Working, p. 404)

52. I want to ride in the front seat. (*Not) otherwise I'm going.

Nor can those discourse connectives like *and*, *but*, and *or* (*else*), to which the conjunction test does not apply, but which themselves realize paratactic relations between sentences, be negated:

53. My old man didn't finish high school. (*Not) 
   {and} he reads a lot.

54. This may mean going into the studio to make a recording. (*Not) or (else) I may do a tape recording at home. (Working, p. 512)
In regard to these forms, at least, the negation test is more informative than the conjunction test.

When we look at those forms to which the conjunction test applies and for which it fails to indicate parataxis, we find a split emerging. On the one hand we have forms like because (CAUSATION), unless (CONDITIONAL EXCLUSION), and like (COMPARATIVE) which can be negated:

55. I was afraid to get too close to those that worked labor. Not because I was afraid of them themselves. (Working, p. 591)

56. I don't do that much reading from Monday through Friday. (Not) unless it's a horny book. (Working, p. 7)

57. I don't enjoy my job anymore. Not like I used to. By both these tests, we are led to believe that these discourse connectives express a paratactic relation. It should be stressed that both so and because express the semantic relation CAUSATION, while otherwise and unless both express CONDITIONAL EXCLUSION. Thus it seems highly unlikely that there is any semantic reason why because and unless can be negated, while so and otherwise cannot be. On the other hand, like and for one thing (both realizing the relation EXAMPLE) and the HEDGE at least cannot be negated, as 58, 59, and 60 illustrate respectively:

58. Even when they pinch us or say dirty things, we're supposed to smile at them. That's one thing they taught us at stew school. (*Not) like he's rubbing your body somewhere, you're supposed to just put his hand down and not say anything and smile at him. (Working, pp. 78-79)
59. Yeah, I prefer laboring to bookkeeping. (*Not) for one thing, a bookkeeping job doesn't pay anything. (Working, pp. 150-51)

60. I was glad to be a cog in the wheel. (*Not) at least it wasn't humiliating. (Working, p. 666)

These results indicate that the connectives illustrated in 58-60 realize a paratactic relation, which appears to be inconsistent with the results of the conjunction test. This inconsistency is more apparent than real, however: that test merely failed to demonstrate that the relations realized by these connectives are paratactic; it gave no evidence that those relations were hypotactic.

4.2.3 Afterthought sentences and sentential adverbs

Thus far, three discourse connectives have been identified which realize clearly hypotactic relations between the sentences of their discourse fragments: because, unless, and like (COMPARISON). It is surely no accident that each of these forms also occurs as a member of the class of words, traditionally referred to as subordinating conjunctions (cf. Quirk et al. 1978:727ff.), which introduces adverbial subordinate clauses. For one thing, both the subordinating conjunctions and the discourse connectives realize hypotactic relations between clauses; for another, the form realizing the hypotactic relation is in both cases attached to the lower clause. Moreover, each discourse connective seems to realize roughly the same semantic relation as the corresponding subordinating conjunction. In
this section, I will discuss three further similarities between sentences containing these hypotactic discourse connectives (which I am calling afterthought sentences) and adverbial clauses. I will also be arguing that these similarities, which are not shared by those sentences containing paratactic discourse connectives, support the claim that these afterthought sentences are sentential adverbs: a claim which is developed further in Chapter V.

4.2.3.1 Afterthought sentences as yes/no questions

The first similarity has to do with the fact that afterthought sentences, unlike those sentences containing paratactic discourse connectives, do not exhibit all the behavior characteristics of main clauses. For example, they do not permit the inversion characteristic of yes/no questions, even though they can function as yes/no questions:

61. S1: Mary ran out of gas yesterday.
    S2a: Because Ralph forgot to fill the tank?
         b: *Because did Ralph forget to fill the tank?

62. S1: If you hit a person's logic, you've got him.
    S2a: Unless you've got a dingaling?
         b: *Unless have you got a dingaling? (cf. Working, p. 303)

63. S1: That's the worst thing, the way they treat you.
    S2a: Just like you have no brains?
         b: *(Just) like don't you have any brains?
         (cf. Working, p. 38)

This behavior is exactly parallel to that of the corresponding adverbial clauses:
64a. Did Mary run out of gas yesterday because Ralph forgot to fill the tank?

b. *Did Ralph run out of gas yesterday because did Ralph forget to fill the tank?

65a. If you hit a person's logic, haven't you got him unless you've got a dingaling?

b. *If you hit a person's logic, haven't you got him unless have you got a dingaling?

66a. Do they treat you just like you have no brains?

b. *Do they treat you just like don't you have any brains?

Clauses containing paratactic discourse connectives, on the other hand, do show the full range of main clause phenomena and can cooccur with yes/no question inversion. This potentiality is illustrated in the following sequences:

67. S1: My brother was caught with his hand in the till last week.

   S2a: And But Yet So did they call the cops?

   b: Did they call the cops though?

   S1: Nah. But they told him he had to make restitution and then leave town.

   S2: Otherwise Or else would he be arrested?

The discourse connective or can also cooccur with inversion, but only when the preceding sentence is also a question:

68. Can we afford to order a pizza? Or am I going to have to fry up the leftover muskrat haunches?

The facts relevant to connectives realizing the semantic relations EXAMPLE and HEDGE are less clear; under at least some conditions, these connectives can cooccur with question inversion, however:
69. Harry got busted for pushing dope. At least, isn't that what the paper said?

70. None of those Washington guys is honest.  
   \{Like
   \{For one thing\}, didn't Congressman Mugwump just get indicted for accepting a bribe from the Ruritanian consul general?

4.2.3.2 Privileges of occurrence within their clause

The facts discussed above support the claim that afterthought sentences, unlike sentences containing paratactic discourse connectives, are not main clauses, but subordinate clauses. Additional support for the same claim lies in the fact that all forms which function as markers of subordinate clauses, at least in English, are restricted to clause initial position. This applies to relative clauses and sentential complements; of more relevance to the present discussion, it also applies to adverbial clauses. It is surely no accident that this same restriction applies to the discourse connectives because, unless, and like, which must appear initially in afterthought sentences:

71a. '...The people there don't pay you off.' Because they were poor people. (Working, p. 749)  
b. ...*They were poor people because.  
c. ...*They because were poor people.

72a. I don't do much reading from Monday through Friday. Unless it's a horny book. (Working, p. 7)  
b. ...*It's a horny book unless.  
c. ...*It unless is a horny book.

73a. That's the worst thing, the way they treat you. (Just) like you have no brains. (Working, p. 38)  
b. ...*You have no brains, (just) like.  
c. ...*You (just) like have no brains.
This restriction is not applicable to paratactic discourse connectives in general. It does apply to the coordinating conjunctions and, but, and or, as Quirk et al. (1978: 552-53) point out. It also applies to so and yet, for reasons which I do not fully understand. (It is interesting to note in this connection that yet and so behave like coordinating conjunctions in other ways as well. For example, Quirk et al. (1978:555) note that these connectives, like and, allow 'ellipsis of the subject of the clause they introduce if the subject is co-referential with that of the preceding linked clause'.) With these exceptions, however, the discourse connectives expressing paratactic relations between sentences can freely appear clause initially, clause finally, immediately following the subject, or after the first auxiliary verb of the clause; they can appear, in fact, anywhere that sentence adverbs can appear within the sentence.

74a. I've been an executive secretary for eight years. However, this is the first time I've been on the corporate end of things... (Working, p. 90)
    b. ...This is the first time I've been on the corporate end of things, however.
    c. ...This, however, is the first time I've been on the corporate end of things.
    d. ...This is, however, the first time I've been on the corporate end of things.

75a. We're looking for things that didn't go out the door the wrong way. ... We're also looking for things such as the floating of cash. (Working, p. 352)
    b. ...We're looking for things such as the floating of cash, also.
    c. ...We also are looking for things such as the floating of cash.
d. ...Also, we're looking for things such as the floating of cash.

76a. Instead of asking for more money, the union should ask for better conditions. Conditions are being improved, though. (Working, p. 53)

b. ...Though conditions are being improved.

c. ...Conditions, though, are being improved.

d. ...?Conditions are, though, being improved.

77a. You're just a teller. Consequently he can call you by your first name. (Cf. Working, p. 350)

b. ...He can call you by your first name.

c. ...He can call you by your first name, therefore.

d. ...He can call you by your first name, consequently therefore.

78a. We filed a civil rights complaint. Otherwise, we woulda never got the promotion. (Working, p. 459)

b. ...We woulda never got the promotion, otherwise.

c. ...We otherwise woulda never got the promotion.

d. ...We would otherwise never have got the promotion.

Again, the facts relevant to the realizations of the semantic relations EXAMPLE and HEDGE turn out to be problematic. Some forms, like like, do indeed appear to be restricted to clause initial position. Others, like at least, can also show up in clause final position:

79. Poland is a free country. That's what Ford said in the 1976 presidential election, at least.

Still others, like for example, can occur in any of the four positions mentioned:

80a. My whole family is musical. For example, Harry is a flutist.

b. ...Harry, for example, is a flutist.

c. ...Harry is, for example, a flutist.

d. ...Harry is a flutist, for example.
This distribution can be accounted for if we assume that these paratactic discourse connectives are in fact the remnants of underlying sentence-adverbial clauses. I will return to this point in Chapter V.

4.2.3.3 Preposability and ambiguity

The identification of afterthought sentences with adverbial clauses is supported by the evidence thus far presented. But it has long been known that adverbial clauses, like other adverbials, can modify both sentences and verb phrases. This difference in modification structure can interact with negation to produce what are often called scope ambiguities. Thus, for example, the following sentences are ambiguous:

81. I'm not going because you told me to.
82. I'm not going like you told me to.
83. I'm not going unless you tell me to.

On one set of readings, the adverbial clause is a constituent of the verb phrase and hence falls within the scope of the sentence operator negation. These readings are paraphrased in 84-86, respectively:

84. It's not the case that I'm going because you told me to.
85. It's not the case that I'm going like you told me to.
86. It's not the case that I'm going unless you tell me to.

On the other set of readings, the adverbial clause falls
outside the scope of the negation. On this set of readings (the sentence adverb readings), the adverbial clause may be preposed, yielding the following unambiguous paraphrases: respectively,

87. Because you told me to, I'm not going.
88. Like you told me to, I'm not going.
89. Unless you tell me to, I'm not going.

This ambiguity between sentence adverbs and verb phrase adverbs allows us to decide which sort of adverbial clauses afterthought sentences ought to be identified with. It turns out that the afterthought sentences have the same entailments as the preposable clauses in 87-89. Moreover, the discourse fragments containing these sentences have precisely the same entailments as sentences 87-89 themselves. Consider the following fragments:

90. I'm not going. Because you told me to.
91. I'm not going. Like you told me to.
92. I'm not going. Unless you tell me to.

Sentences like 87 and 88, like fragments 90 and 91, entail that the speaker is not going, and that the listener told the speaker to go. Sentence 87, like fragment 90, further entails that there is a causal relationship between these two states of affairs; sentence 88 and fragment 91 both entail that not going is like what the speaker was told to do. Finally, both sentence 89 and fragment 92 entail that the speaker will not go in any event other than that in
which he is told to do so by the listener. None of these entailments fall out of sentences 84-86; they simply deny that the three semantic relations of CAUSATION, COMPARISON, and CONDITIONAL EXCLUSION, respectively, obtain between the propositions named by their constituent clauses. On semantic grounds, then, afterthought sentences ought to be identified with sentence adverbs, not verb phrase adverbs.

Of the discourse connectives thus far identified as paratactic, only one can appear at the head of a prepositive clause. That one is though:

93. Though now I'm doing what I want do, I know it's not gonna last. (Working, p. 455)

Interestingly, when a postpositive though clause appears following a negation, no ambiguity results. Thus 93, 94, and 95 all have the same entailments:

94. I know it's not gonna last, though now I'm doing what I want to do.

95. I know it's not gonna last. Now I'm doing what I want to do though.

If though clauses were ever verb phrase adverbial clauses, then 96 would be a paraphrase of 94:

96. ?It's not the case that I know it's gonna last though now I'm doing what I want to do.

But 96 doesn't seem to be a possible sentence in English. And for it to be a sentence adverb clause it would have to realize a hypotactic relation, which, according to all the other tests discussed, it does not do. I am at present unable to resolve this seeming contradiction.
4.2.4 Summary

The results of the tests for hypotaxis and parataxis discussed in this section are summarized in Table 2. These results are not as clear cut as we would like for all cases. There is some confusion, for example, about the syntactic role of though, as discussed immediately above. It is not at all clear, moreover, what sort of syntactic relationships are realized by the discourse connectives like, for one thing (both EXAMPLES) and the HEDGE at least: by tests 2, 3, and 5, those relationships appear to be paratactic, but the results of test 1 indicate something different from the coordinate relationships realized by most other paratactic discourse connectives. And, at least at this point, I know of no way of explicating what that difference is.

Nevertheless, some patterns emerge. For one thing, although the coordinating conjunctions and, but, and or clearly realize paratactic relations, their behavior under tests 1 and 4 mark them as sufficiently distinct from the other paratactic discourse connectives to warrant treatment as a special class. For another, it is interesting to note that the only clear cases of hypotaxis (which is syntactically asymmetrical relation) are realized by because, unless, and COMPARISON like, each of which realize semantically asymmetrical relations (cf. Chapter III). In fact, for a discourse connective to realize a syntactically asymmetrical relation, it appears to be a necessary (although not a
sufficient) condition that it also realize a semantically asymmetrical relation. I doubt that this is an accident. In any case, the tests discussed in this chapter support a division of the connectives examined into three paratactic categories and one hypotactic category. This division is summarized in Table 3.

4.3.0 Tree structures for discourse fragments

The results of the previous sections have provided sufficient information to motivate a description of three types of surface structure corresponding to three types of syntactic relations contained within discourse fragments: type I (paratactic), type II (paratactic), and type IV (hypotactic). The representational device will be the labeled constituent structure tree, defined in terms of precedence (left to right), dominance, and command (cf. Wall 1972:144-52). The root node of each such tree will be labeled F (for discourse fragment); otherwise, all the conditions met by conventional syntactic trees will be met. (In the following chapter, I will argue for the remote structure underlying these surface structures and describe the operations which map one level onto another.)

4.3.1 Parataxis, type I

Discourse fragments containing discourse connectives realizing a paratactic relation of type I between constituent sentences consist simply of two sentence nodes both
TABLE 3
SYNTACTIC CATEGORIES OF CONNECTIVES

<table>
<thead>
<tr>
<th>Connective</th>
<th>Type I</th>
<th>Type II</th>
<th>Type III</th>
<th>Type IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONJUNCTION</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>and, but</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>however, also</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>yet</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>though</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ALTERNATION</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>or, or else</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>CAUSATION</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>so</td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>because</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CONDITIONAL EXCLUSION</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>otherwise</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>unless</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>COMPARISON</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>like</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>EXAMPLE</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>like, for one thing</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>HEDGE</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>at least</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

KEY:  Type I...Paratactic, and type
      Type II...Paratactic, so type
      Type III...Paratactic, at least type
      Type IV...Hypotactic
immediately dominated (as sisters) by a single F node. Since the connective invariably attaches to the second sentence of the pair, the rightmost of these two sister nodes will itself immediately dominate a node labeled D (for discourse connective) and an additional sentence node; there is no evidence that connectives of this type (unlike those of types II and IV) are ever dominated by an ADV node. The resulting tree, illustrated in 97, describes the surface structure of discourse fragments where D is a member of syntactic type I:

4.3.2 Parataxis, type II

Discourse fragments containing connectives of this type exhibit a paratactic (i.e., mutually commanding) relationship between their constituent sentences. Their surface structures, like those of fragments containing connectives of type I, consist of two S-nodes (sisters) immediately dominated by F. Here again the connective D is attached to the rightmost sister node—but not as in 97. The distribution of discourse connectives of type II within their clauses is much freer than that of type I. In fact, discourse
connectives of this type can (as I discuss in the first section of Chapter V, below) appear anywhere in their clauses that sentence adverbs can. It is not unreasonable then to allow D to be dominated by a node labeled ADV, which in turn is a daughter node of the rightmost S-node, thus:

\[
\begin{array}{c}
F \\
\text{S} \\
\text{S} \\
\text{ADV}
\end{array}
\]

4.3.3 Hypotaxis, type IV

The surface structure of discourse fragments containing discourse connectives of type IV is somewhat more complicated. For one thing, the second sentence within the discourse fragment, to which the connective is attached, is in a hypotactic relationship to the first. That is, the leftmost sentence unilaterally commands both the rightmost sentence and the discourse connective signaling the relation. But the right sister of the commanding sentence cannot itself be a sentence; if it were, we would end up with the same structure as in 97, and we have already seen that fragments containing connectives of type IV do not behave like those containing connectives of the other types.
The only way to give a structural account of the differences between this type of fragment and the others is to assume that the rightmost of the two nodes immediately dominated by F is something other than a sentence. If we make this assumption, then the failure of this type of fragment to exhibit the various paratactic phenomena would fall out of the fact that the two sister nodes were of different grammatical categories. And it turns out that we have a number of reasons (some already discussed and some yet to be developed in Chapter V) for wanting to identify that right sister as an adverbial (ADV). Thus we can use the tree shown as 99 to describe general surface structure of discourse fragments where D is of type IV.
Bill Lycan has suggested to me that something at least similar to autophoricity does occur. I can't accept all of his examples: the following

This very phrase is made of three words.

strikes me as a very odd sentence, and hereby in the next example refers to the performance of a speech act, rather than to the sentence which expresses that speech act:

I hereby (i.e., by this act) excommunicate you.

But the fact remains that there are cases in which the pro-form makes reference to the sentence containing it, as, for example, in:

This sentence is in English.

or

This statement is false.

I'm not sure how metalinguistic statements like these bear on this issue. If Lycan is right in suggesting that they do, however, then any explanation of the distribution of discourse connectives based on anaphoricity loses much of its appeal.

Although there are no cataphoric discourse connectives Arnold Zwicky has suggested to me the possibility that anaphoric discourse connectives can be used cataphorically, as (for example) a literary device for starting a short story. Other anaphoric forms, such as pronouns, are certainly used cataphorically in this fashion: Halliday and Hasan 1976: 298 cite the first sentence of Carroll's Through the looking glass as an example of this, and another well known case of the same technique occurs in Stephen Crane's short story, 'The open boat':

None of them knew the color of the sky.

However, I know of no literary works where discourse connectives are used cataphorically. Moreover, all the examples of such usage that I have tried to construct turned
out to be rather bizarre:

?Otherwise, Harry Smith would have been home in bed when the building collapsed.

?Because she got tired of waiting.

The most successful cases of this kind that I was able to construct appeared when the opening sentence of the discourse was a piece of dialogue. Thus:

'But you never told me not to set my hair on fire,' the child pointed out.

'Because you couldn't find one? Don't be absurd!' expostulated the Duchess.

But in any case it is not clear to me how literary data—especially when as mannered as the above—is to be interpreted. Even if aesthetically successful examples of cataphoric use of discourse connectives are found or constructed, I'm not certain how the existence of such examples would bear on the issue of their grammaticality. Certainly such examples do not appear in natural speech.

Otherwise can also connect sentences of different types; when it does, it cannot cooccur with and:

*Is it raining? And otherwise I'll get the beer.

*You must be careful. And otherwise you'll get hurt.

Conjunction is only possible when both the parataxis condition and the like-constituent condition are met.

The picture is further complicated by the fact that in some cases (none of which appeared in the sample), at least can cooccur with conjunction:

He may be a Republican, but at least he's honest about it.

I don't really know what to say about such cases (concessives?), except to note that they tend to include this odd use of may, which is neither alethic nor deontic, in the first clause and, in regard to their suprasegmental characteristics, act more like sentences than discourse fragments. At any rate, I shall have no more to say about them here.
Chapter V

OPERATIONS ON DISCOURSE TREES

5.0 Introduction

In the previous chapter, I have argued for the surface structures of discourse fragments containing discourse connectives of each of the four syntactic categories. In the present chapter, I will be concerned with presenting and motivating the remote structures which I conceive to underlie these surface structures (or at least those surface structures associated with connectives of types I, II, and IV: as I have already indicated, I do not at present understand connectives of type III well enough to motivate an analysis). I will also provide a description of the several operations which, acting upon these remote structures, allow us to trace the derivation of surface structures like those described in the last section of Chapter IV. In characterizing these operations, I will be especially interested in exploring any similarities between them and the transformational rules which, within the paradigm of generative grammar, function to map one sentential constituent tree onto another.
According to the analysis that I will be arguing for, the three types of surface structures described in Chapter IV will each be derived from one of two distinct remote structures. The first of these remote structures underlies only those discourse fragments which contain discourse connectives of the kind identified as type I: and, but, and or. It is shown here in its most general form, where D is a discourse connective of type I:

1.

\[
\begin{align*}
F & \\
S_1 & \quad D \quad S_2
\end{align*}
\]

The second kind of remote structure, which underlies all discourse fragments containing discourse connectives of type II or IV (and, for all I know to the contrary, type III), is represented, also in its most general form, by 2:

2.

\[
\begin{align*}
F & \\
S_1 & \quad S_2
\end{align*}
\]

Since a structure like 2 is here claimed to underlie sur-
face structures containing both hypotactic and paratactic discourse connectives, it would follow that the analysis commits me to the view that hypotaxis and parataxis are themselves quite superficial notions. This, as I argue below, turns out to be the case.

5.1 Motivating the analysis

In this section, I describe the phenomena which motivate the two types of remote structures set forth above. These phenomena include full and partial paraphrase relationships between discourse fragments containing connectives of type II and IV, the surfacing of these connectives as either paratactic or hypotactic, the distribution of connectives of types II, III, and IV within their respective discourse fragments, and the privileges of occurrence of discourse connectives of types II and IV with respect to each other (the cooccurrence of discourse connectives of both types is discussed in section 4.2.1, above, and, with respect to negation, in section 5.3, below).

5.1.1 Connectives of types II and IV

One question that any account of discourse connectives must address is how a particular semantic relation is realized by a hypotactic discourse connective in one case and by a paratactic one in another. Thus, for example, the semantic relation CAUSATION was realized in my sample by the paratactic connectives so, consequently,
and *therefore*, and by the hypotactic connectives *because* and *whereas*. Given the generative semantics paradigm that I'm working in, it would be convenient if the semantic identity of these connectives were to manifest itself at some point in the syntactic derivations of the discourse connectives containing them.

Accordingly, I would like to propose that there is in fact a level at which this identity is manifest: that all discourse connectives expressing the CAUSATION relation _C_ have remote structures like the following:

3. 

```
      F
     / \
   S₁   S₂
     /   |
   S₃   ADV
     |
    C   S₄
```

By this analysis, the subtree _S₂_ would have the same remote structure as any sentence containing a sentential adverbial clause modifier. As an example, let _S₂_ be the following sentence:

4. Harry lost the election because he rather foolishly got arrested for armed robbery.

This will have the structure represented by 5, below.

If nothing happens to change this configuration, _C_ will
be expressed here as the subordinating conjunction, because. But suppose that one of the sentences dominated 5.

![Diagram of sentence structure]

by $S_2$ in fragment 3 happens to be equivalent to $S_1$? In such a case, we could get discourse fragments like either of the following: 6 where $S_1$ equals $S_4$, and 7 where $S_1$ equals $S_3$:

6. Harry rather foolishly got arrested for armed robbery. He lost the election because he rather foolishly got arrested for armed robbery.

7. Harry lost the election. He lost the election because he rather foolishly got arrested for armed robbery.

Both of these are possible discourse fragments. They are unlikely, however (and 6 is much less likely than 7), since both of them contain an inordinately high degree of redundancy.

Another—and more likely—possibility for each of these cases would allow the reduction of this redundancy by the deletion of the repeated sentence. If this sort of deletion applied to the structure underlying 6, $S_4$
would be deleted; the resulting structure would look something like 8:

8.

![Diagram 8]

If the deletion were to apply to the structure underlying 7, on the other hand, $S_3$ would be deleted. The result in this case would be 9:

9.

![Diagram 9]

But that would leave $S_2$ as a non-branching sentence node. Ross (1969) has proposed that, when configurations of
this kind arise through the action of deletion rules, an operation which he calls tree pruning should be allowed to apply to delete the S-node in question. If such a rule applies to 9, the result is 10:

10.

At this point, the CAUSATION relation, C, can be marked as a member of one of the syntactic categories II or IV. Each discourse connective comprises a triple of semantic class, syntactic category, and phonological representation. The semantic class is specified in the underlying (i.e., semantic) structure of the discourse fragment. The syntactic type is determined by the structure of the discourse fragment at the time at which the prelexical marking of the relation takes place. The lexicalization processes, then, map the intersection of a syntactic type and a semantic class onto an appropriate phonological representation. But first, the relation must be marked as a member of one of the syntactic categories. This
marking is, as I mentioned above, structure dependent. If C commands a sentence node which is dominated by the same ADV node which dominates C, then C will be marked as a member of type IV and eventually be lexicalized as a hypotactic connective such as because. This applies whether the C-node is itself dominated by a sentence node (as in 5) or not (as in 10). The same lexicalization process thus realizes C as because both as a hypotactic discourse connective and as a subordinating conjunction. Where, on the other hand, C does not command a sentence node, as in 8, the relation is marked as a member of the syntactic category IV. These two prelexical marking operations are stated in their most general form (viz., with D, representing any semantic relation, replacing C) as 11 and 12, respectively:

11. S.D.: \( \text{ADV}[^D S] \)
   \[1\ 2\]
   S.C.: \[1\ 2\]
   [type IV]

12. S.D.: \( S[X \text{ADV}[^D Y] \]
   \[1\ 2\ 3\]
   S.C. 1 2 3
   [type II]

If the operation stated in 12 applies, the relation will be realized by a paratactic discourse connective.

But before lexicalization of a relation marked as a member of category II can take place, the ADV node must
be lowered into $S_3$. Paratactic discourse connectives of type II, true to their character as adverbs (or more precisely, as the remnants of adverbial clauses), can appear anywhere in $S_3$ that sentential adverbs generally can. The result of this lowering is a structure like 13 (the non-branching sentence node, $S_2$, has been pruned):

13.

It appears that the same rule which allows unreduced adverbial clauses to appear at various points within their matrix sentences does the lowering here—at least I know of no other reason why these paratactic discourse connectives should, as 14-16 illustrate, share the privileges of occurrence of adverbials:

14a. So Harry lost the election.
   b. Because he rather foolishly got arrested for armed robbery, Harry lost the election.

15a. Harry therefore lost the election.
   b. Harry, because he rather foolishly got arrested for armed robbery, lost the election.

16a. Harry lost the election, consequently.
   b. Harry lost the election, because he rather foolishly got arrested for armed robbery.
The motivation for allowing ADV-lowering to precede lexicalization is that the discourse connective *so* can only appear in sentence initial position (unlike *therefore* and *consequently*, which can appear in any adverbial position). I am not entirely clear as to why *so* is restricted in this way; nevertheless, the lexicalization of *C* as *so* is doubly structure dependent: it must follow the deletion of the sister node, *S_4*, and it must follow the adjunction of *C* as the leftmost daughter node of *S_3*.

The results of applying these operations to remote structures like 3 are the two structures 10 and 13, which represent the surface structures of fragments 17 and 18, respectively:

17. Harry lost the election. Because he rather foolishly got arrested for armed robbery.

18. Harry rather foolishly got arrested for armed robbery. So he lost the election.

By exactly parallel operations will be derived fragments realizing the CONDITIONAL EXCLUSION relation, *X*. That is, where, as in 19, the sentence dominated by the ADV node (*S_4*) is equivalent to the first sentence of the fragment (*S_1*), the operations of EQUI-S deletion, ADV-lowering, and tree pruning will apply, resulting in 20. At this point, the structural description for marking *X* as a member of syntactic type II is met, allowing *X* to be lexicalized as the paratactic discourse connective, otherwise (or, although it wasn't found in this sample,
as the relatively literary discourse connective, else); discourse fragment 21 is the result.

19.

20.

21. Professor Arid is going to stop chasing freshmen. Otherwise, he'll be arrested.

But if in 19 the left sister of ADV ($S_3$) is equivalent to the first sentence of the fragment ($S_1$), then EQUI-S deletion (applying this time to $S_3$) will operate, resulting in 22. At this point, the structural description of 22 is such that $X$ will be marked as a member of type IV and lexicalized as the hypotactic connective, unless.
The resulting discourse fragment is 23.

22. Professor Arid will be arrested. Unless he stops chasing freshmen.

The parallel derivations of therefore and otherwise, on the one hand, and because and unless on the other, are just what would be expected, for the same motivation for the analysis exists in both cases. For one thing, the semantic identity of the two lexicalizations of the CONDITIONAL EXCLUSION relation suggests an underlying identity between the remote structures of discourse fragments containing unless and those containing otherwise. For another, otherwise, like therefore, realizes a paratactic relation between sentences and can occur anywhere in a sentence that an adverbial clause can:

24a. Otherwise, the theory will be falsified.
    b. Unless chow mein precipitates out of the solution, the theory will be falsified.

25a. The theory otherwise will be falsified.
    The theory, unless chow mein precipitates out of the solution, will be falsified.

26a. The theory will otherwise be falsified.
    b. The theory will, unless chow mein precipitates out of the solution, be falsified.
27a. The theory will be falsified otherwise.
   b. The theory will be falsified unless chow mein precipitates out of the solution.

And unless, like because, occurs both as a hypotactic discourse connective and as a subordinating conjunction. The present analysis claims that it is no accident that these forms resemble each other, since both have a common semantic source and a common syntactic derivation. Moreover, since subordinating conjunctions are restricted to clause initial position, the present analysis gives an account of why hypotactic discourse connectives of type IV, unlike most paratactic ones of type II, can appear only in clause initial position.¹

The two semantic relations thus far discussed, CAUSATION and CONDITIONAL EXCLUSION, may be lexicalized either as type II paratactic or type IV hypotactic discourse connectives, depending on the structure of their trees when prelexical marking takes place. None of the other relations described in Chapter II enjoy a like freedom. The COMPARISON relation, for example, may be lexicalized only by the hypotactic connective like; discourse fragments containing this connective have derivational histories just like those of fragments containing unless or because, and these derivations can be similarly motivated. All lexicalizations of the CONJUNCTION relation, on the other hand, are of type II (paratactic),
except for *and* and *but*, which are type I paratactic, and which are discussed below, in section 5.1.2. These connectives, including *also*, *yet*, *though*, *too*, *on the other hand*, *moreover*, etc., show the same syntactic properties as *therefore* and *otherwise* (except for *yet*, which behaves just like *so*), and it seems reasonable to suppose that the derivational histories of discourse fragments containing these connectives are parallel to those of the other members of type II.

The facts concerning discourse connectives of these two semantic classes, CONJUNCTION and COMPARISON, is less than clear, however. For one thing, although the privileges of occurrence of discourse connectives of type II realizing CONJUNCTION are sufficiently like those of adverbs to warrant their dominance by an ADV-node in surface structure, the absence of hypotactic connectives realizing the same relation removes one kind of evidence that these same ADV nodes ever dominated sentences. Also, it's not clear why there should be no paratactic discourse connectives realizing the COMPARISON relation, either in my sample or, as far as I can determine, in English. Does such a form exist in any natural language? It would be interesting to find out.

The present analysis of discourse connectives permits the following generalization about the lexicalization of the underlying semantic relation: when an S-node
deleted under identity is a sister of an ADV-node (and hence unilaterally commands the semantic relation in remote structure), the relation is realized as a hypotactic discourse connective. If, on the other hand, the deleted S-node is immediately dominated by an ADV-node (and hence is the right sister of the semantic relation in remote structure), the relation is realized as a paratactic discourse connective. But what can happen when an S-node dominated by an ADV-node itself dominates another ADV-node? After all, English is recursive, and adverbial clauses can themselves contain adverbial clauses, with an indefinitely large number of self embeddings possible. Here, I will examine only cases where one degree of self embedding occurs in deep structure—cases, that is, like 28, below. A number of distinct surface structure types can be derived from structures like 28, depending upon which sentences dominated by S₂ are equivalent to S₁ (or more precisely, as we will see below, to sentences dominated by S₁) and hence subject to deletion.

To begin with, let us assume that it is S₃ which is equivalent to S₁. If S₃ is deleted, then S₂ will be pruned and, in the resulting structure (29), Dα will be realized as a discourse connective of type IV (hypotactic). If no other sentence dominated by F is equivalent to S₁, then no further deletion will take place, and Dβ will
be lexicalized as a subordinating conjunction. Such a derivation might produce a discourse fragment like 30.

28. F
   \[S_1 \quad S_2\]
   \[S_3 \quad \text{ADV}_a\]
   \[D_\alpha \quad S_4\]
   \[S_5 \quad \text{ADV}_b\]
   \[D_\beta \quad S_6\]

29. F
   \[S_1 \quad \text{ADV}_a\]
   \[D_\alpha \quad S_4\]
   \[S_5 \quad \text{ADV}_b\]
   \[D_\beta \quad S_6\]
30. Ferdy must be a real pervert. Because seducing wombats is an unnatural act unless the wombat is a consenting adult.

But if $S_5$ is also equivalent to $S_1$, $S_5$ too can be deleted. If it is, then $S_4$ will be pruned. In the resulting structure, 31, $Dottage$ will, like $D_{\alpha}$, be lexicalized as a discourse connective of type IV. Here, the derivation will lead to a fragment like 32.

31.

```
  F
 /   \
S_1  ADV_a
   /  \
  D_{\alpha}  ADV_b
    /   \
   D_\beta  S_6
```

32. Jean Valjean would never have stolen the Bishop's silver candlesticks. Unless because he was afraid of starving to death.

But if, in 29, it is $S_6$ which is equivalent to $S_1$, then $S_6$ will be deleted, $ADV_b$ will be lowered into $S_5$, and $S_4$, which will no longer branch, will be pruned. In this case--33--$D_\beta$ will be lexicalized as a paratactic discourse connective of type II. Fragment 34 is an example of such a derivation. Finally, given a structure like 29, suppose that $S_4$ was equivalent to $S_1$ and $S_3$. Then $S_4$, and everything dominated by it, would be deleted. The result in
34. Jean Valjean stole the Bishop's silver candlesticks. Because he would have starved otherwise. This case, 35, would not provide the structure for any well formed discourse fragment, because there is no way that $D_\alpha$ can be lexicalized here. It cannot be lexicalized as a discourse connective of type IV because it no longer commands an S-node. And it cannot be lexicalized as a connective of type II because it is not dominated by an S-node. This inability for $D_\alpha$ to undergo any lexicalization process is not a superficial fact—it falls out of
the very nature of discourse connectives as expressions of the semantic relationships between sentences. If there is only one sentence present, as in 35, then there is no way in which such a connective can occur as part of a semantically well formed utterance.²

This exhausts the structural possibilities derivable from 28 on the assumption that $S_3$ is equivalent to $S_1$. Next, let's see what happens on the assumption that $S_4$ is equivalent to $S_1$. On this assumption, $S_4$ could be deleted under identity, along with everything dominated by it. Then, $ADV_a$ having been lowered into $S_3$, $S_2$ would be pruned. The resulting structure, 36, would meet the

36.

$$
\begin{array}{c}
F \\
S_1 \\
S_3 \\
\downarrow \downarrow \downarrow \\
ADV_a \\
D_\alpha
\end{array}
$$

structural description for prelexical marking of $D_\alpha$ as a paratactic discourse connective of type II. Note that this analysis makes the correct prediction that discourse fragments like 37, in which a paratactic discourse connective of type II precedes a hypotactic connective of
type IV, can never arise.

37. *Jean Valjean stole the Bishop's silver candlesticks. So unless he would have starved. (cf. 32 and 34, above)

For a fragment like 37 to be derived from a remote structure like 28, $D_\alpha$ would have to be realized as a connective of type II. But this could only happen if $S_4$ were deleted under identity with $S_1$. But if $S_4$ is deleted, then $D_\alpha$ (which could be realized as a discourse connective of type IV if $S_6$ is also deleted under identity) will itself be deleted, since it would be a constituent of $S_4$. Thus, on the present analysis, there is no possible derivation which will give rise to a fragment like the ill formed 37.

The present analysis does, however, permit the derivation of discourse fragments like 38, in which one paratactic discourse connective of type II precedes another:

38. Joan will probably get tenure. Otherwise, however, he'll probably take that job at Moose Jowl State.

But the remote structure of 38 is not like 28, but rather like 39. If in this case $S_1$ is equivalent to $S_5$, $S_5$ can be deleted by EQUI-S, and $ADV_b$ will be lowered into $S_4$, yielding a structure like that represented by 40. At this point, $S_3$ will be pruned and, the structural description for ADV-lowering thus being met, $ADV_a$ will be
lowered into $S_4$, becoming a sister node of $ADV_b$. This will leave $S_2$ dominating only a single node. Pruning $S_2$, then, results in the following structure, which
provides the superficial structure of 38:

41.

\[
\begin{array}{c}
F \\
S_1 \\
S_4 \\
\text{ADV}_b \quad \text{ADV}_a \\
\text{D}_\beta \quad \text{D}_\alpha
\end{array}
\]

The relations $D_\beta$ and $D_\alpha$ are lexicalized as connectives of type II, in this case otherwise and however, respectively. But the ADV-lowering rule (stated formally in section 5.2.1, below) will allow either connective to appear any place in $S_4$ that any sentence could. The rules presented here thus allow the derivation of a number of possible fragments, including, in addition to 38, the following:

42. Joan will probably get tenure. However, she'll otherwise probably take that job at Moose Jowl state.

43. Joan will probably get tenure. Otherwise, she'll probably take that job at Moose Jowl State, however.

44. Joan will probably get tenure. Probably, however, she'll take that job at Moose Jowl State otherwise.

But even given a structure like 39, the generalization that paratactic discourse connectives cannot precede hy-
potactic discourse connectives holds, for no possible combination of the rules stated here will allow the derivation of a configuration meeting the structural description which would allow the underlying relations to be lexicalized in such a fashion.

5.1.2 Connectives of type I

There are only two syntactic facts that an analysis of the derivation of discourse fragments containing the type I (paratactic) discourse connectives and, but, and or must account for. The first of these, their restriction to clause initial position in the rightmost sentence within the fragment in which they occur, has already been alluded to. The second is that no more than one discourse connective of type I can occur in any given discourse fragment. Thus, for example, fragments like the following are impossible:

45. *Ralph went to the movies. And but Mary stayed home.

46. *Ralph is crazy about Errol Flynn movies. Mary can take them or leave them, but.

But fragments like these are not always impossible for any obvious semantic (or pragmatic) reason. Fragments 47 and 48, which are paraphrases of 45 and 46, respectively, are perfectly all right:

47. Ralph went to the movies. And yet Mary stayed home.

48. Ralph is crazy about Errol Flynn movies. Mary can take them or leave them, however.
This indicates that the impossibility of 45 and 46 must be accounted for on syntactic grounds.

The remote structure I propose for discourse fragments which, like 49, contain discourse connectives of type I assumes that these connectives are, quite literally, no more than lexicalizations of the logical operators 'A' and 'K'.

49. [the strike] spread from here to the east coast.
And it went on for nine weeks. (Working, p. 292)

Accordingly, I assign fragments like 49 remote structures like 50:

Moreover, the prelexicalization process marking these relations as members of type I is dependent on the operator appearing in just this configuration. So:

51. S.D. $F[S D S]$
    1 2 3
S.C.  1 2 3
[type I]

The structural description of this process makes it explicit that D can only be marked as a member of type I when it has one S-node as right sister and another as left sister. This precludes the occurrence of more than one discourse connective of type I per discourse fragment,
since 51 exhaustively lists the nodes commanded by D.

After the process of prelexical marking has taken place, the D node is Chomsky-adjointed to the rightmost S-node immediately dominated by F. This process (which I call CONJ-lowering) maps structures like 50 into structures like 52, which represent the surface structure of discourse fragments like 49:

52.

In the following section, I will state this operation formally and show how it interacts with the other operations on discourse trees already mentioned.

5.2 Operations on discourse trees and transformations

In the previous section, the following operations on discourse trees have been described informally: EQUI-S deletion, pruning, ADV-lowering, and CONJ-lowering. They have not been stated formally, however. In this section, I will provide formal statements of these operations, using the conventions of classical (i.e., sentence level) transformational grammar. This stratagem is calculated: the claim implicit in using the formal apparatus of sentence level syntax for stating operations on levels of
structure which include sentences as proper parts is that such levels are formally similar to sentences. Also in this section, I provide arguments (again paralleling those of classical transformational grammar) which support a partial ordering of these operations, relative to each other and to the prelexicalization processes already described.

5.2.1 **Formalizing the operations**

The first operation to be stated is EQUI-S deletion. As already indicated, this operation allows the reduction of redundancy at the discourse level by the deletion, under certain conditions, of any sentence node identical to some preceding sentence node. The conditions are that the deleted sentence node \( S_n \) must be dominated by a sentence node \( S_2 \) which is a right sister to the sentence node \( S_1 \) dominating the sentence node controlling the deletion \( S_m \); moreover, \( S_1 \) and \( S_2 \) must be dominated by the same root node, \( F \). This operation is stated formally as follows:

53. EQUI-S deletion:

\[
S.D.: \quad F \left[ S_1 \left[ X \quad S_m \quad Y \right] \quad Z \quad S_2 \left[ X' \quad S_n \quad Y' \right] \right]
\]

<table>
<thead>
<tr>
<th>1 2 3 4 5 6 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>S.C.:</td>
</tr>
<tr>
<td>1 2 3 4 5 0 7</td>
</tr>
</tbody>
</table>

Condition: \( 2 = 6 \)

'By convention', as Wall (1972:208) notes, 'the dominance relation is taken to be reflexive'. Hence, the structural
description of EQUI-S, as stated in 53, will be satisfied if nodes X and Y are null and \( S_1 = S_m \). But discourse fragments did occur in the sample in which the sentence controlling deletion was not immediately dominated by F. Fragment 54 is an example of this:

54. I smile when I have something to smile about. Otherwise, I don't.

The Z is intended to allow this operation to apply in those relatively few cases (discussed in section 4.1.4) in which additional material intervenes between the pair of sentences linked by the discourse connective.

The second operation, ADV-lowering, is actually not an operation which has discourse trees as its domain. It is instead a \textit{local transformation} with respect to S (cf. Chomsky 1965:215) and can be stated without reference to any node higher than S. Thus: given a sentence node \( S_m \) immediately dominating both another sentence node \( S_n \) and an ADV-node, sister adjoin the ADV-node to any node immediately dominated by \( S_n \). Formally:

55. ADV-lowering

\[
S.D.: \quad S_m [ S_n [ X \ Y \ Z ] \text{ADV} ]
\]

\[
S.C.: \quad 1 \quad 2 \quad 3 \quad 4
\]

\[
S.C.: \quad 1 \quad \{ 2 \ast 4 \} \quad 3
\]

This operation is arguably the same operation which swoops sentence adverbs such as \textit{probably} into positions in
sentences such as the following:

56a. Probably we'll survive the fall of Skylab.
   b. We probably will survive the fall of Skylab.
   c. We'll probably survive the fall of Skylab.
   d. We'll survive the fall of Skylab, probably.

(I'm assuming here, for the sake of the exposition, that 'any node immediately dominated by $S_n$' refers to the constituents NP, AUX, VP, and—optionally—ADV. For an example of ADV being adjoined to ADV, see the derivation of fragment 38, above.)

The third operation, CONJ-lowering, is the only one which makes direct reference to a D-node. It functions to Chomsky-adjoin the discourse connective to the rightmost sentence node ($S_2$) of the pair that is immediately dominated by the same F-node immediately dominating D itself. This operation is formally stated as 57:

57. CONJ-lowering
   S.D.: $F[S_1\ D\ S_2]\$
   S.C.: 1 2 3
   1 0 2#3

As stated, 54 requires D to be dominated by an F-node. This is almost certainly too narrow a formulation, for a similar operation could be motivated to account for intrasentential phrasal conjunction, such as in 58:

58. Dorothy Sayers wrote about upper middle class English life, and so did P. G. Wodehouse.

The same constraints apply to intrasentential conjunction as apply to discourse conjunction, after all: one
connective of type I per pair of conjuncts and restriction of that connective to clause initial position in the second conjunct, with the greatest degree of hiatus occurring between the first conjunct and the connective. These facts suggest that the maximally general statement of CONJ-lowering will require the relabeling of the F-node identified in 57 as a variable (X) exhaustively dominating S₁, D, and S₂, as in 59:

59. CONJ-lowering II

\[ S.D.: \quad X[S₁ \ D \ S₂] \]
\[ \quad 1 \ 2 \ 3 \]
\[ S.C.: \quad 1 \ \emptyset \ 2 \#3 \]

Pruning, the final operation I want to state formally, is, as Ross (1969:289) pointed out, not a transformational rule in the strict sense, but 'a well-formedness condition on trees'. That is, it applies obligatorily any time its structural description is met. Its function is to eliminate all non-branching S-node--S-nodes, that is, immediately dominating a single node). It can be stated as follows:

60. Pruning

\[ S.D.: \quad X[S₁[Y] \ Z] \]
\[ \quad 1 \ 2 \ 3 \ 4 \]
\[ S.C.: \quad 1 \ + \ 3 \ + \ 4 \]

Condition: 3 is a single node

The result of pruning, as 60 indicates, is not only to
eliminate the non-branching S-node, but also to promote
the single node immediately dominated by that node so
that it becomes a sister node to those which were formerly
sister nodes to the deleted node.\textsuperscript{4}

5.2.2 Ordering the operations

The formal statement of the operations given above,
combined with an understanding of the possible surface
configurations that discourse fragments can assume, allows
us to make some claims about how these operations, as
well as the prelexical processes previously stated, must
be ordered with respect to each other. Not all of these
operations interact with each other directly. However,
the assumption that ordering is transitive allows the
following order of application to be established:

61. EQUI-S deletion
   ADV-lowering
   Prelexical.marking
   CONJ-lowering

(Pruning, it will be recalled, applies any time that its
structural description is met. However, of the operations
listed above, only EQUI-S and ADV-lowering give rise to
such a structural description.)

The first argument is that EQUI-S deletion must pre-
cede ADV-lowering. Consider structure 62. If $S_1$ is iden-
tical to $S_3$, then the structural description of EQUI-S
will be met and $S_3$ will be deleted. But if the ADV-node were lowered into $S_3$ before this deletion--giving rise to structure 63--then the ADV-node would also be deleted, giving rise to structure 64. But it is only a structure like 65 which allows hypotactic discourse connectives of type IV to occur, and given this ordering, structures like 65 would not be possible. Hence the position that
ADV-lowering precedes EQUI-S deletion would preclude the possibility of discourse fragments like 17, repeated here for convenience:

17. Harry lost the election. Because he rather foolishly got arrested for armed robbery.

But fragments like 17 can be derived if EQUI-S is allowed to precede ADV-lowering, for if EQUI-S applies directly to 62, deleting S₃, then, after pruning has applied to delete S₂, 65 will result. At this point, the structural description for ADV-lowering is not met, and so this operation cannot apply to 65, which directly underlies fragments like 17.

CONJ-lowering, too, can be shown to be ordered after EQUI-S deletion. Consider the remote structure 66, below. Assuming no identity among its constituent sentences,
no deletions would occur and, after CONJ-lowering, 66

66.

would surface as discourse fragment 67:

67. Seymour took the job at Conundrum Institute of Technology. And he ought to do well there unless they make him teach freshman composition.

(The surface structure of 67 is given as 68.)

68.

But suppose that there is a condition of identity between \( S_1 \) and \( S_3 \). In that case, the structural description for EQUI-S will be met, and \( S_3 \) can be deleted. This will
force the pruning of the node which dominated it. If CONJ-lowering has already applied, that node will be $S_2$, and 69 will be the result:

\[
\text{69.}
\]

But 69 is not a structure which underlies any wellformed discourse fragment: it would instead underlie fragments like the ungrammatical 70:

\[
\text{70. *Harry will buy the Volvo. And unless he's a real meatball.}
\]

But if EQUI-S applies directly to 66, the result is 71:

\[
\text{71.}
\]

At this point, the derivation blocks, since the structural description for CONJ-lowering is not met. This is the desired result, since 71 underlies no well formed discourse fragment. The ordering EQUI-S and then CONJ-lowering,
unlike the alternative ordering, will thus block the derivation of ill formed fragments like 70.

There is, unfortunately, no way of directly ordering ADV-lowering and CONJ-lowering relative to each other because, as stated, they never interact with each other directly. This can be demonstrated by the application of both operations to a remote structure like 72 in both of the possible orders:

\[
72.
\]

\[
\begin{array}{c}
F \\
| \alpha | \\
S_1 \quad S_2 \\
| \beta | \\
S_3 \quad ADV \\
| \beta | \\
\quad D \quad S_4
\end{array}
\]

There are actually three operations which will be applied to 72: EQUI-S deletion, CONJ-lowering, and ADV-lowering. This would in principle allow six (three factorial) possible orderings. However, it has already been shown that any order in which EQUI-S follows either CONJ-lowering or ADV-lowering can be eliminated. Thus, assuming that \( S_1 = S_4 \), we are actually concerned here with the effects of ADV-lowering and CONJ-lowering on 73, to which EQUI-S has already applied. But the application of the
two operations at issue in one ordering provides results indistinguishable from those arising from their application in the other. If ADV-lowering precedes CONJ-lowering, for example, 73 will be mapped first into 74 and then into 75.

If, on the other hand, CONJ-lowering precedes ADV-lowering, 73 will be mapped first onto 76 and then onto 77. But the only difference between 75 and 77 is that in 75 the rightmost daughter of F is $S_3$ and in 77 it is $S_2$. Since both of these nodes dominate the same con-
stituents, this difference is not significant.

But even though CONJ-lowering can't be ordered directly with regard to ADV-lowering, it can be ordered relative to the operation which marks certain D-nodes as members of syntactic type I. I have already pointed
out (section 5.1.1) that the structure dependent nature of the prelexicalization rules which mark D-nodes as members of syntactic type II or IV necessitates an order in which these prelexicalization rules follow ADV-lowering or EQUI-S, respectively. Now suppose that, as seems plausible, all prelexicalization rules, including that marking D-nodes as type I, apply simultaneously. In that case, the latter operation would follow ADV-lowering as well as EQUI-S. Then, if it could be shown that CONJ-lowering follows this prelexicalization operation, it would follow that CONJ-lowering follows ADV-lowering.

Can such an ordering be supported? The facts here are admittedly not as clear as some others presented above, but there are two kinds of reasons for believing that D-nodes are marked as members of type I before they
are Chomsky-adjointed to the sentence on their right. The first of these reasons has to do with the fact that the operation of prelexical marking of type I can be stated more economically on the ordering described in section 5.1.2. As stated this operation precedes CONJ-lowering, since its structural description requires the D-node marked as a member of type I to be immediately dominated by an F-node and to be a sister of two S-nodes. This rule can be stated, however, so that it applies to the output of CONJ-lowering, as follows:

\[
S.D.: \quad x[S_1 \quad S_2 \quad [D \quad S_2] \quad ]
\]
\[
\begin{array}{cccc}
1 & 2 & 3 & 4 \\
S.C.: & 1 & 2 & 3 & 4 \\
\end{array}
\]

[type I]

But this rule refers to an additional level of structure beyond that stated by 51. Hence 51, which has a 'flatter' structural description, is preferable on methodological grounds. It's also worth pointing out that this flatness of 51 captures the essentially conjunctive quality of type I connectives more perspicuously than does 78.5

The second (and to my mind the more compelling) reason for preferring 51 to 78, and hence for accepting the ordering in which CONJ-lowering follows the prelexicalization operation, is based on the apparent fact that all human languages have discourse connectives of type I (cf. Gazdar and Pullum 1976:230). If this is
an accurate assessment, than it would be an error to state what may well be a universal rule marking semantic relations as members of this class in such a way that it is dependent on what is almost certainly a language specific rule for placing the relation so marked into sentences. A more reasonable approach, I would argue, is to make the marking of such relations dependent on the (putatively language independent) semantic representation of the discourse fragments containing them.

5.3 Parataxis, hypotaxis, and negation

In this section, I would like to use the apparatus developed so far to shed light on a number of interesting phenomena. These phenomena involve what happens when negation occurs in the second sentence of a discourse fragment. One of the points which will become clear is that, as already suggested, the characteristics of parataxis and hypotaxis are quite superficial in that under certain circumstances discourse fragments containing hypotactic discourse connectives, such as because and unless, can show paratactic properties.

For the purposes of this section, I will assume a transformational rule of NEG-lowering. This rule, which will insert the sentence operator, negation, into the appropriate position of any sentence occurring as its immediate right sister, can be stated roughly as
follows:

79. NEG-lowering

S.D.: $S_m [NEG S_n [X Y Z] X']$

$1 2 3 4 5$

S.C.: $\emptyset 2 3+1 4 5$

This rule maps trees or subtrees like 80 into structures like 81:

80.

```
   Sm
     |   Neg
     |  Sn (ADV)
       |     |   Neg
       |   Sm
     S_n (ADV)
```

81.

```
   Sm
     |   S_n (ADV)
       |     Neg

       S_m
```

Note that if the structural description of this NEG-lowering did not specify $S_n$ as the immediate right sister of NEG, the rule could apply to map structures like 82 into sentences like 83, instead of into 84.

82.

```
   S_1
     Neg  S_2  ADV
       |   |   |
       |   I eat lampreys  because I dislike them
```
83. I eat lampreys because I don't dislike them.

84. I don't eat lampreys because I dislike them.

(This rule could be made still more precise by specification of where in \( S_n \) NEG can occur. However, since I am not concerned here with sentence internal detail, I will not do this here.)

NEG-lowering will be ordered after EQUI-S deletion. The argument for this ordering is as follows: given tree 85, allow \( S_1 \) to equal \( S_3 \). If EQUI-S does not apply to this structure, then it will surface, after the obligatory operation of NEG-lowering, as 86. If EQUI-S does apply, then 85 will surface as 87.

85.

86. Jane likes eels. She doesn't like them because they taste good.

87. Jane likes eels. Not because they taste good.

Suppose that NEG-lowering applies first. But if \( S_3 \) is equal to \( S_1 \) in remote structure, then \( S_3 \) will not equal \( S_1 \) after the point at which NEG-lowering has applied.
Thus the conditions of EQUI-S will not be met and 87 will not be derivable. But if EQUI-S is allowed to apply first, then one of two things will happen. If this rule does apply, then $S_3$ will be deleted and, since the structural description of NEG-lowering will not be met, 87 will result. But EQUI-S is an optional rule: if it does not apply, then NEG-lowering will, resulting in 86. Thus, only by allowing EQUI-S to precede NEG-lowering is the hypothesis tenable that both 86 and 87 are derived from a structure like 85.

The first phenomenon involving negation that I would like to discuss is the fact that negation cannot occur to the immediate left of a paratactic connective in surface structure (it might also be noted at this point that exactly parallel phenomena involving sentence adverbs such as just, probably, and the like admit of similar treatment). This fact was used in section 4.2.2 as one of the criteria for distinguishing hypotactic and paratactic connectives, and it was pointed out there that discourse fragments like 88, which contains a paratactic connective of type II, and 89, which contains a paratactic connective of type I, are both impossible.

88. My old man didn't finish high school. *Not so he likes to read all the time.

89. This may mean going into a studio to make a recording. *Not or I may do a tape recording at home.
Let's look at 88 first. According to what has been said so far, the remote structure underlying 88 must be something like 90, with $S_1$ equal to $S_4$. If $S_4$ is deleted by EQUI-S, the result will be 91.

But at this point, the structural description of NEG-lowering, which is an obligatory transformation, will be met. Moreover, no further operation on 91 will create a configuration in which this structural description is not met, since the only operations still to apply will lower the ADV-node under $S_3$ and mark D as a member.
of type II. Thus 88 is impossible because an obligatory transformation, the structural description of which was met, failed to apply during its derivation. If, in addition to the other operations described above, NEG-lowering does apply to 90, the result, 92, is perfectly all right.

92. My old man didn't finish high school. So he doesn't like to read all the time.

This derivation should be compared with that of 87, which contains a hypotactic--type IV--discourse connective. In that case, as I pointed out, NEG-lowering cannot apply after EQUI-S because the deletion rule destroys the configuration specified in the lowering rule's structural description. Hence the negation remains outside the ADV-node.

Now to account for what went wrong with 89. Here the remote structure will be, according to the analysis presented thus far, something like 93.

93.

```
F
 /\  
S₁ /  
D  /
 /\ 
S₂ /  
/   /
NEGS₃
```

To derive 89 from this, the operations that will apply are CONJ-lowering and the marking of D as a member of
type I. But here again, there is no point in the derivation at which the structural description of NEG-lowering is not met. In this case too, then, the impossibility of a given discourse fragment can be traced back to the failure of an obligatory transformational rule to apply when its structural description is met.

Another interesting point about which operations can and cannot apply when negation is involved sheds some light on the superficiality of the syntactic properties hypotaxis and parataxis. It was noted in Chapter IV that one of the criteria for identifying type IV discourse connectives was their inability to appear with the type I connectives and, but, and or. I accounted for this inability by positing an operation of CONJ-lowering, stating it in such a way that it would not apply when the type I connective was left sister to an ADV-node, and claiming that such a configuration, which underlay no well formed discourse fragment, would block any further derivation. Such a configuration arises when EQUI-S deletes the S-node occurring as right sister to ADV in remote structure and then by pruning the S-node immediately dominating ADV. If the operation of pruning were somehow blocked, so the above configuration did not arise, it should follow that CONJ-lowering could apply, Chomsky-adjoining the type I connective to the unpruned S-node dominating ADV and allowing the derivation to
continue.

This is exactly what happens when, as in the following structure, negation occurs as an immediate constituent of the sentence dominating ADV.

If, in such a case as 94, $S_1$ were equal to $S_3$, then EQUI-S could apply normally to delete $S_3$. However, $S_2$ would immediately dominate more than one node at this point (viz, NEG and ADV). Thus the structural description of pruning would not be met and $S_2$ would still be available (once the prelexicalization operations have marked $D_\alpha$ and $D_\beta$ as members of syntactic type I and IV, respectively) for $D_\alpha$ to be adjoined to. Once CONJ-lowering had applied, the result would be 95, which represents the surface structure of discourse fragments like 96, 97, and 98.

The last phenomenon that I would like to discuss in this section involves a very interesting case of
96. I work hard. But not like I used to.

97. Jane likes eels. And not because they taste good.

98. Ralph will help you find your hamster. But not unless you ask him to.

synonymy between discourse fragments. Consider the following:

99. Mary won't eat eels. Unless they've been peeled.

100. Mary won't eat eels. Not unless they've been peeled.

What's striking about these synonymous fragments is that the presence or absence of negation in the second sentence of each fragment seems to have no effect on their interpretations: both are paraphrases of fragment 101:

101. Mary won't eat eels. Unless they've been peeled, she won't eat them.
The present analysis allows an explanation of why this is so. Both fragments 99 and 100, I would claim, as well as 101, have the same remote structure, shown as 102.

102.

To make this discussion easier to follow, I list the content of each S-node of 102 in 103.

103. \( S_1 = \) M. won't eat eels  
    \( S_2 = \) M. will eat eels  
    \( S_3 = \) M. won't eat eels unless they've been peeled  
    \( S_4 = \) M. won't eat eels  
    \( S_5 = \) M. will eat eels  
    \( S_6 = \) eels have been peeled  

It will be noted from 103 that \( S_1 \) is equal to \( S_4 \). So, by EQUI-S, \( S_4 \) can be deleted. If it is deleted, then the structural description of pruning will be met, and
$S_3$ will be pruned. The result is 104, which is the surface structure of fragment 99:

104.

```
F
   S1
      NEG S2
      ADV
```

But this is not the only identity listed in 103: it is also the case that $S_2$ is equal to $S_5$. If EQUI-S applies to delete $S_5$, pruning will again take place, this time deleting $S_4$. The result of this derivation is 105, which is the surface structure of fragment 100:

105.

```
F
   S1
      NEG S2
      ADV
   S3
      NEG
      ADV
      D S6
      X
```
This analysis also predicts that discourse fragment 100 is ambiguous, since it could also be derived from the following remote structure.

106.

```
           F
          /|
         / |\  
        /  |  \  
       /   |   \ 
      /    |    \ 
     /     |     \
    /      |      X
   /       |       
  /        |        
 /         |         
 S₁       / S₃      
          /   \
         /    
        /     
       /      
      /       
     /        
    /         
   /          
  /           
 S₂           S₄
            /   \
           /     
          /      
         /       
        /        
      /          
     /           
    /             
   /               
  /                 
/                   D
/                     S₅
/                      
```

In this case, $S_2$ would be equal to $S_4$, so EQUI-S would delete $S_4$, yielding a surface structure identical to that represented by 105. The interpretation of 100 based on this derivation would be something like 107:

107. Mary won't eat eels. It's not the case that she will eat them unless they've been peeled.

Unfortunately, I don't get this interpretation for 100. In fact, I'm not even sure that 107 is coherent. Certainly there's something odd about it, and it may turn out that there are independent semantic reasons for throwing it out so that it won't be available as an interpretation for 100.
This turns out to be what's happening in another case where an expected ambiguity fails to materialize. Fragment 108 ought to be ambiguous, since it should be derivable from either 109 or 110 by the deletion of $S_4$ or $S_5$, respectively:

108. I give up. But not because I'm afraid of you.

109.

```
F
  | 
S_1 S_2
  |   
S_3 ADV
  |   
NEG S_4 D S_5
  |   
C
```

110.

```
F
  | 
S_1 S_2
  |   
S_3 ADV
  |   
NEG S_3 D S_4
  |   
C
```
For EQUI-$S$ to delete $S_4$ from 109, $S_4$ must be equal to $S_1$. But because of the semantics of the CAUSATION relation, 109 entails both $S_1$ and $S_3$, and in this case $S_3$ is the negation of $S_4$, and $S_4$ is equal to $S_1$. That is, the interpretation of 108 based on structure 109 is equal to the following contradiction:

111. I give up. But because I'm afraid of you, I don't give up.

Hence this interpretation is not available to us, and 108 has only the following interpretation:

112. I give up. But it isn't the case that I give up because I'm afraid of you.

And this fragment is derived from the remote structure represented by 110.
Notes

1 These are the facts as they apply to English. It would be a fascinating project to ascertain whether, in languages having subordinating conjunctions with different syntactic characteristics, the parallels with hypotactic discourse connectives would still hold.

2 It should also be noted in this connection that it would be a very weird remote structure that would consist of three identical sentences and thus allow the deletions which gave rise to 35; there is some evidence that discourse connectives cannot link identical sentences in English (see, e.g., R. Lakoff 1971: 121-122). If this is the case, then the structure which would underlie 35 would itself be ill formed.

3 Since I can't motivate the claim that ADV-nodes immediately dominating connectives of class K (CONJUNCTION) also dominate S-nodes, I leave open the question of whether ADV_a dominated, at some more remote level of representation than that represented by 39, an S-node. If it did, then EQUI-S will have removed it. This equivocation does not affect the derivation of 38 from 39.

4 If Ross (1969:289) is correct in his position that only embedded sentences may be pruned, and if I am correct in claiming that S-nodes not dominated by any other S-node can be pruned (as in the derivations of 30, 32, and 34, above), then it would follow that the pruned S-node must have been embedded under some other kind of constituent, viz. a discourse fragment. The pruning analysis thus provides additional motivation for the claim that there are suprasentential levels of structure.

5 The S.D. of CONJ-lowering is such that it can apply in its present form either before or after the D-node is marked for syntactic type.

6 In this case, as in the previous example, I must be concerned about the structural description of NEG-lowering being met throughout the derivation because I know of no way to specify the order of NEG-lowering with regard to any other operation except EQUI-S, described in the present work. Thus I have no way of knowing where in these derivations this rule is to apply.
Chapter VI
DISCUSSION

6.0 Introduction

In this final chapter, I would like to summarize what I consider to be the major contributions made by this dissertation to our understanding of human language. I would also like to show how the results of the present research interact with the model of language use, and the general conversational principles governing language use, developed by Grice. The chapter will close with some applications of these results to problems in other fields—fields which are increasingly looking toward theoretical linguistics as a source of insights as to how human language works. These fields include reading research, the regulation of advertising, and composition and rhetoric, all of which could profit by an explicit theory of discourse connectives (I say nothing about the value to these fields of a fully developed, explicit, theory of discourse grammar).

6.1 Summary of results

This dissertation was begun with two goals in mind. The first was to provide an analysis of the discourse
connectives commonly occurring in spontaneous, colloquial English. After identifying a fairly large corpus of discourse fragments containing such connectives in my sample text, Working, I began my analysis with a survey of existing taxonomies and then, finding existing taxonomies inappropriate for my purposes here, presented a new taxonomy, organized on purely semantic grounds (Chapter II). Next, arguments were given that the members of each class identified in this taxonomy show all and only the semantic properties ascribed to that class; this included some argument as to which notional properties were entailments (and thereby relevant to a semantic taxonomy) and which were not (Chapter III). My next concern was to identify some of the syntactic properties of discourse fragments containing the various connectives. These properties, including constituency, hypotactic vs. paratactic internal structure, privileges of occurrence within the fragments, etc., were then translated into structural descriptions of the various fragments, defined in terms of precedence, dominance, command, and labeling (Chapter IV). The final phase of the analysis was to provide derivations for the surface structures so described. This involved motivating remote structures and then formally stating and ordering the operations mapping those remote structures into surface structures
(Chapter V).

The fact that these discourse connectives occur in human language is sufficient warrant for their claim to the scholarly attention of linguists; their analysis is thus legitimate research in its own right. But this goal, as I have already indicated, was only one of two addressed in this dissertation. It is the second goal of this work which I believe to be of more general theoretical importance. This goal has been to demonstrate that analytical techniques heretofore applied only to sentences can be profitably applied to more complex levels of linguistic organization. In pursuit of this goal, I have consciously applied the methods and argumentation developed within the general paradigm of generative grammar to the analytical problem described above. For the best response to a priori claims about what a particular methodology cannot do is a constructive one. Hence, I will have succeeded in my second goal to the precise degree that the analysis presented here has added to our understanding of discourse connectives in English.

It should be mentioned at this point that another interpretation of these results is possible, however. This interpretation was first brought to my attention by Stephen Isard, who suggested (personal communication)
that my work on discourse connectives might be taken as 'not so much undermining the privileged status of sentences as showing that the class of sentences isn't what we thought it was. That is, your examples all seem to involve small, syntactically well-defined, combinations of sentences, and your arguments could be taken as arguments that these combinations could themselves be viewed as sentences'. Michael Geis and David Dowty have since independently made very similar suggestions.

There are really two issues raised by this kind of suggestion. The first is largely terminological: there is no reason why anything 'syntactically well-defined' cannot, ipso facto, be called a sentence, and the structures that I have been calling discourse fragments may indeed be thought of as a new type of sentence in that sense. But as Isard notes, these are distinct from what linguists have generally meant when they have talked about sentences. Hence, my own feeling is that the new category label, \( F \), is warranted. But I will not argue with anyone who chooses to interpret that label as 'funny sentence' rather than as 'discourse fragment'.

The second issue is more substantive, and there are two possible ways of dealing with it. One would be to demonstrate that the discourse fragment is, on some principled ground, a theoretically distinct entity from the sentence. But although I believe that such a
demonstration is possible, I will not attempt it here. Instead, I will simply point out that what I have been calling the discourse fragment is a more complex level of structure than the sentence as heretofore considered by most linguists because it contains such sentences as proper parts. Moreover, as I have noted in section 5.3, what I have been calling discourse fragments can themselves be embedded as proper constituents of still more complex structures. Thus, I would argue, the present dissertation has succeeded in extending the techniques of sentential analysis 'beyond the sentence'—at least insofar as the class of sentences has been defined by the developers of those techniques.

6.2 Discourse connectives, logic, and conversation

There are two aspects of the model for conversation described in Grice (1975) of special relevance to the present work. The first of these is Grice's assertion that the notional content of connectives like therefore is only conventionally implicated, and not entailed, by sentences, and presumably by discourse fragments, containing them. This, of course, is directly contradicted by what I had to say in Chapter III, and I would like to show that Grice's position in this regard is incorrect.¹ The second aspect of Grice's model which relates directly to the present work is his postulation
of certain conversational maxims which, ceteris paribus, participants in conversation assume will be followed by the other participants. In this case, the relation between Grice's position and my own is complementary, rather than contradictory: I would like to claim that discourse connectives are formal devices which are useful in the satisfaction of at least two of these maxims: the maxim of Quantity and the maxim of Relevance.

6.2.1 Connectives and conventional implicature

Grice (1975:44-45) has claimed that in uttering the following discourse fragment (which he calls a sentence, presumably for orthographic reasons), the speaker has 'committed [himself] by virtue of the meaning of [his] words to its being the case that his being brave is a consequence (follows from) his being an Englishman'.

1. He is an Englishman; he is therefore brave.

But Grice denies that his 'utterance of this sentence would be, strictly speaking, false' if the he in question were both an Englishman and brave, but that the one attribute did not, in fact, follow from the other. In other words, Grice wants to say that the utterer of 1 has not said, 'in a favored sense', that there is a causal relation between the two states of affairs described by 1. Instead, he claims, the imputation of causality arising from 1 is a conventional implicature of 1, to which the speaker is committed by virtue of the meaning of the
word therefore.

This, I believe, is simply false. But before I can argue against Grice's position, I would like to examine his notions saying in a favored sense (hereinafter, SAYING) and conventional implicature as they compare with the notion of entailment that I have been using in the present work. Clearly, if something is SAID, it is also entailed. To repeat the definition I gave in section 2.2: if one logical structure $P$ entails another logical structure $Q$, the $Q$ cannot be false without $P$ also being false. And by extension, I have talked about a sentence being an entailment of a discourse fragment if the sentence cannot be false without the fragment also being false. Thus, the test for entailment is simply this: if the conjunction of a discourse fragment with the negation of a sentence alleged to be an entailment of that discourse fragment yields a contradiction, then the sentence is in fact an entailment of that discourse fragment. This is essentially the same test which Grice uses in distinguishing what is SAID from what is implicated, for what is SAID is logically independent from what is conventionally implicated, in the sense that the implicature can be false without what is SAID being false.
But if something is entailed, it is not necessarily thereby SAID. Entailment is a relation between logical structures. But if something is SAID it is also asserted, and assertion is a speech act which expresses a relation between a logical structure and the real world. That SAYING is in fact a speech act is made clear by the fact that Karttunen and Peters (forthcoming:17-18) offer the property of **non-challengability** as a definitional characteristic of conventional implicature: a conventional implicature cannot be 'challenged in a direct way...if one wishes to take issue with [a] conventionally implicated proposition, one has to spell it out directly'. What is SAID, on the other hand, can be challenged in a direct way. But challenging assertions, like making them, is a kind of speech act: it amounts to denying that the relationship expressed by an assertion between a logical structure and the real world obtains. And as a speech act, we would expect its felicity to be dependent on other than purely logical considerations. And indeed, it isn't hard to find entailments which cannot be 'denied in a direct way'. Thus, for example, both 2a and 3a entail that John is a republican:

2a. John, who is a republican, voted for Reagan.
   b. ?No he isn't.

3a. Ever since John became a republican, he hasn't been any fun at all.
   b. ?No he isn't.
Yet the b sentences are decidedly odd as challenges to their respective a sentences. This is what we would expect if only what is asserted is subject to being challenged, whether it is entailed or not, for what is challenged in each case by the b sentence is entailed, but not asserted, by the a sentence.

If Grice is correct in saying that the imputation of causality from fragments like 1 is a conventional implicature, than this imputation must satisfy two criteria: it should not be an entailment of 1 (and hence should make no contributions to 1's truth conditions), and it must not be directly challengable. Although I will argue below that neither of these criteria are met, my principal concern here is with the former one, for I have argued above (in section 3.2) that fragments containing connectives of the same class as therefore have this imputation as an entailment. This claim is crucial to the further claim that discourse connectives can have truth conditional content beyond that of simple conjunction. But it would follow from Grice's position both that the notional content of therefore (and presumably of the other connectives of the same class, at least) is not susceptible to any semantic analysis, and that discourse fragments like 1 do not have any interesting semantic structure beyond the sentence level.
The strongest sort of evidence for the claim that a causal relationship is entailed by fragments like 1 will not rely on speech-actish tests like challengability, but on cases where the truth conditions of the discourse fragments are themselves clearly affected by the presence of the connective therefore. As it happens, just such a case has been discovered by Kempson (1975:214). She cites the following sentence:

4. If Bill hit Mary and therefore she was covered with bruises, she will have won her suit for damages.

She points out that 4 would be false if its antecedent were true and its consequent false. But if its antecedent were semantically equivalent to 5, and if Mary lost her case, we would not consider that state of affairs to falsify 4.

5. Bill hit Mary and she was covered with bruises. In fact, if Mary's counsel could only prove 5, she would almost certainly lose her case, given our present legal system. For 4 to be false, its antecedent must entail not only 5 but also something like 6:

6. Bill's hitting Mary caused her being covered with bruises.

And for Mary to win her case, she would have to prove 6. Hence, Kempson notes, therefore does indeed make a contribution to the truth conditions of 4, and this contribution cannot be explained by any analysis based on
conventional implicature.

It also turns out that the imputation of causality from fragments containing therefore fails to meet the other criterion mentioned for being a conventional implicature, challengability. For this imputation can in fact be challenged directly. One can easily imagine the following response to 1:

7. That's not true: he's brave in spite of the fact that he's an Englishman.

This response certainly takes issue with fragment 1. And if it's necessary to specify that it is the imputation of causality that is being denied, it's only because 1 has more than one entailment. Consider the following response to 1:

8. That's not true: he's an arrant coward.

Certainly no one would deny that the sentence he is brave is entailed by fragment 1. Yet, since the response no, you're wrong would be intolerably vague, it is necessary to spell out which part of 1 is being challenged. It is true that the phrase, 'challenge in a direct way' is sufficiently vague that it is hard to test conclusively. Nevertheless, it seems clear that the imputation of causality in question can be challenged reasonably directly, which in turn suggests that anyone uttering a fragment like 1 has indeed SAID that there is a causal relation between the two states, being English and being brave.
6.2.2 **Discourse connectives and Grice's maxims**

Discourse connectives are, like other grammatical objects, formal devices which allow speakers to accomplish certain tasks posed by the requirements of communication. Grice (1-75:45) has pointed out that one of these requirements is that all parties to any conversation observe a general principle (called the **Cooperative Principle**) which he states as follows: 'Make your conversational contribution such as is required, at the stage at which it occurs, by the accepted purpose of the talk exchange in which you are engaged'. In this section, I would like to show how discourse connectives are used to satisfy this principle by showing how they assist the speakers in obeying two of the maxims which compose it: the maxim of Quantity and the maxim of Relation.

The maxim of Quantity comprises two submaxims:

I. 'Make your contribution as informative as is required for the current purposes of the talk exchange' and possibly

II. 'Do not make your contribution more informative than is required'

Discourse connectives allow us to satisfy this maxim without appeal to conversational implicature. For if the conversational requirements of a particular talk exchange necessitate a particular semantic relation between sentences, then that relation need only be derived
by conversational implicature if it is not entailed. By way of illustration, note the contrast between 10a and 10b as answers to question 9:

9. Why does Leon cheat at cards?
   a. He's a Marxist.
   b. Because he's a Marxist.

In case 10a, it will probably be assumed that the respondent is following the cooperative principle. This assumption warrants the implicature that there is a causal relation between Leon's cheating and his Marxism: viz., that the former is caused by the latter. But this implicature is not absolutely safe. The possibilities exist, after all, that the respondent did not hear the question, was flouting the cooperative principle, or was not answering the question for some other reason. But in case 10b, the occurrence of the connective because entails the causal relation; the procedure of conversational implicature, accordingly, is unnecessary. Moreover, we would consider 10b to be more informative (and I use this word in a non-Gricean sense here) because it does not admit all the possible infelicities of 10a.

And in general, we would consider a contribution that entails a particular sentence to be more informative than one which only implicates it, because it is stronger. Thus, for example, 11 is more informative than 12, because 11 entails 13 (as well as it entails 12
itself while 12 only implicates 13:

11. Honoria's pet ferret just died. So she's very unhappy.

12. Honoria's pet ferret just died. And she's very unhappy.

13. Honoria's unhappiness is caused by the death of her pet ferret.

I base this distinction on the fact that anyone asserting 12 has not committed himself to the truth of 13. If the hearer concludes on the basis of 12 that 13 is true, he does so largely on his own responsibility: if 13 were denied, as in the following exchange, speaker 1 might feel that speaker 2 was being uncooperative, but he surely would not be justified in saying that speaker 2 had contradicted himself:

14. S1: How's Honoria doing?
   S2: Well, her pet ferret just died. And she's pretty unhappy.
   S1: Is she unhappy because the ferret died?
   S2: Oh no! It was a gift from a rich aunt, and she always hated the little horror. She's unhappy because her doctor told her that she had to quit smoking.

But a speaker asserting 11 has committed himself to the position that 13 is also true. His assertion can be falsified by the denial of 13, as 12 cannot be:

15. S1: Honoria's pet ferret died. So she's pretty unhappy.
   S2: No, you've got it all wrong. It was a present from a rich aunt and she always hated it. She's unhappy because her doctor told her she had to quit smoking.

Thus, 11 is a stronger assertion than 12 because it can
in principle be more easily falsified. And it is a more informative (again, in a non-Gricean sense) assertion than 12 because, unlike 12, it actually adds to the hearer's knowledge about what the speaker believes to be the case (barring out-and-out lies) and is willing to commit himself to.

At this point, I would like to make a few remarks about which semantic relations between sentences can be entailed without the use of discourse connectives. In general, the only semantic relation which can be so entailed is CONJUNCTION (traditionally referred to as asyndetic conjunction—cf. Quirk et al. 1978:550). This falls out of the semantic properties of CONJUNCTION, since that relation is the weakest obtaining between sentences that entails the logical conjunction of the sentences within the discourse fragment. And, by the inference schema of addition we know, for any two logical structures \( P \) and \( Q \), that \( K(P,Q) \) will be true if and only if \( P \) is true and \( Q \) is true. But what happens in cases where there is an conversational implicature that a different relation holds, one which does not entail the conjunction of the two sentences contained in the fragment? Consider the following example:

16. There are no irrational numbers. That's what Professor Dumdum believes.

By conversational implicature, plus our knowledge of
the real world, we might reasonably infer that this fragment contains a HEDGE, and hence is equivalent in force to 17:

17. There are no irrational numbers. At least, that's what Professor Dumdum believes.

But notice that 17, which does not entail that there are no irrational numbers, is not the only possible interpretation of 16. Another possible interpretation is that paraphrased by 18, which does entail that there are no irrational numbers:

18. There are no irrational numbers. And that's what Professor Dumdum believes.

I would like to claim that the first sentence in 16 is ambiguous, and that which of the two readings is taken as the appropriate one depends on whether or not the first sentence in 16 is interpreted as true. On the assumption that it is true, 18 is, by addition, an entailment of 16. But if that assumption is not made, then there is no semantic relation entailed between these two sentences.²

The tersest of the Gricean maxims is the maxim of Relation: 'Be relevant'. He notes that since participants in conversation assume that the maxims are being followed, the juxtaposition of two sentences conversationally implicates that those two sentences are relevant to each other. To illustrate this point, he adduces the following example: 'A is standing by an obviously
immobilised car and is approached by B, and the following exchange takes place:

[19.] A: I am out of petrol.
   B: There is a garage around the corner.

(Gloss: B would be infringing on the maxim "Be relevant" unless he thinks, or thinks it possible, that the garage is open and has petrol to sell; so he implicates that the garage is, or at least may, be open, etc.)' (Grice 1975:51). But the juxtaposition of sentences does not in itself specify how these two sentences are relevant to each other. This is true not only for 19, but also for 20 and 21:

20. Montag lost all his money. He likes to gamble.

21. Republicans tend to have terrible taste in music. Sam, he likes the Grateful Butterfly.

But contrast 20 and 21 with 22 and 23, respectively:

22. Montag lost all his money. Because he likes to gamble.

23. Republicans tend to have terrible taste in music. Like Sam, he likes the Grateful Butterfly.

In fragments like 22 and 23, the presence of the discourse connectives because and like specifies that the relation between the two sentences of each is in the one case CAUSATION and in the other EXAMPLE. But in 20 and 21, although the hearer might reasonably infer that those relations held in each case, that inference would be based on conversational implicature and therefore, as
pointed out above, would be deniable. It is true that not every relation (i.e., every method of satisfying the maxim 'Be relevant') obtaining between the sentences of a conversation can be expressed by a discourse connective—I know of none, for example, that would make explicit the relation between the two sentences of 19. But for the expression of a number of frequently used, stereotypical relations (notably those listed in section 2.2, above), the discourse connectives of natural language are available.

6.3 **Applications**

As a member of the academic community, I am ex officio committed to the value of scholarly research for its own sake. But I also believe that scholarly research has a more persuasive claim to public support if it can demonstrate that its pursuit is to the public benefit. Accordingly, I would like to close this chapter with some suggestions as to the application of the results achieved by this dissertation to problems in other fields—fields which would be considered by the general public as being of more immediate utility to the common welfare, perhaps, than theoretical linguistics.

One such field is the teaching of reading and the research which supports it. As regards the actual teaching of reading, many authors have criticised a word
centered approach as inadequate for getting children to see the larger patterns of information in what they read. One response to this criticism has been to develop sentence centered approaches which could deal with the patterns of information at the sentence level. But could this latter approach not be supplemented, at least, by an approach to reading which admits the discourse as a level of interest? If I am correct in claiming that there are patterns of syntactic and semantic organization at levels beyond the sentence, then such an approach might be worth trying, especially since there is no other way to get at the contributions that discourse connectives make to what is read.

On the research level, one perennial difficulty has been a reliable method of measuring the complexity of texts and their effects on comprehension. The analysis of discourse fragments presented above could well provide a means for measuring at least one facet of this complexity if, as seems reasonable, the number of deletions across sentence boundaries, with their consequent necessity for the recovery of what has been deleted before interpretation can take place, is positively correlated with processing difficulty. This analysis would also allow a measure of processing difficulty in terms of discourse fragments which had alternate derivations
(cf. section 5.3, above) and especially of discourse fragments which lacked explicit markers of the relations between sentences. I would expect that the text in such cases, where a conversational implicature (or textual implicature) was required, would be harder to process than similar tests which, containing the connective, allowed the corresponding entailment. This should be especially relevant with regard to children, since conversational implicatures typically depend on knowledge of the world as well as the maxims of conversation, and the particular piece of information required to draw the implicature in a given instance may not be available to the child.

One of the most exciting areas of application for the present work is the area of accountability in advertising. Recent work by Michael Geis (much of it as yet unpublished, but to appear in his work in progress on language and power) has shown that truth in advertising, as well as truth in general, is a largely linguistic question. In this area, it is especially important to be able to measure the strength of claims made by advertisers in order to determine what standard of accountability they ought to be held to. And, as noted above, the strength of a given claim can be heavily influenced by the presence or absence of particular discourse connectives. For example, consider the following two
fragments as possible advertising claims:

24. Ms. Peascod took the recommended dosage of Exahype. Five minutes later, her headache was gone.

25. Ms. Peascod took the recommended dosage of Exahype. As a result, five minutes later, her headache was gone.

According to Grice (1975), neither of these claims should be 'strictly speaking' false if it turned out that Exahype had nothing to do with the disappearance of Ms. Peascod's headache, for the imputation of causality would be a conversational implicature in the case of 24 and a conventional implicature in the case of 25. Thus, on Grice's analysis, advertisers making either claim could not be held accountable, since they never SAID that Exahype had caused Ms. Peascod's headache to disappear. According to the analysis that I have presented, however, 24 and 25 make quite different claims, since 25 entails the causal relation in question while 24 does not. Thus, an advertiser asserting 25 would be held to be making a stronger claim than one asserting 24 and would hence be liable to higher standards of accountability.

A different kind of application for the present analysis of discourse connectives is illustrated by the following fragment from a possible advertisement:

26. There is no laxative available without a prescription more gentle than Jolibowel. That's what four out of five doctors at a leading Bugtussle hospital told us on a recent survey.
As already noted, fragments like 26 are ambiguous between a reading like 27 and one like 28:

27. There is no laxative available without a prescription more gentle than Jolibowel. And that's what four out of five doctors at a leading Bugtussle hospital told us on a recent survey.

28. There is no laxative available without a prescription more gentle than Jolibowel. At least that's what four out of five doctors at a leading Bugtussle hospital told us on a recent survey.

Only on the first reading would an advertiser claiming 26 be asserting Jolibowel to be the most gentle non-prescription laxative. But if held to account, such an advertiser could always claim that he meant 28. But any consumer hearing 26 would be likely to elect the reading of 28, since doctors are frequently believed to be both honest and knowledgeable about medications. This advertisement thus has the effect of fooling the hearer into the belief that it is making a stronger claim than the advertiser needs to support. One way of dealing with this sort of deception might be to require advertisers to disambiguate fragments like 26 by replacing the with fragments like either 27 or 28. If the advertiser were prepared to support the claim as to Jolibowel's gentleness, he would be safe in asserting 27. If not, then he could only assert 28, and no one hearing 28 would, regardless in his confidence in the medical profession, would be likely to implicate 27. But even if this remedy is not adopted, the present analysis at least gives an
explicit account of what is going on in 26, which is a prerequisite for dealing with it.

Of the fields mentioned as applications for the analysis presented here, the one in which I am personally most involved is the teaching of writing (and indeed, it was my desire to find a model for the analysis of expository prose that led to my interest in discourse grammar). It has long been recognized by rhetoricians that discourse connectives, by whatever term they have been identified (e.g., transitions, transitional connectives, transitional devices, devices of coherence, or—by Young, et al. 1970—plot cues) are of crucial importance to the writing process. Booth (1963:83) notes:

I remember the day when P. A. Christensen made me understand that my failure to use effective transitions was not simply a technical fault but a fundamental block in my effort to get him to see my meaning...that I should never write a sentence that was not in some way explicitly attached to the preceding and following sentences.

Unfortunately, the insight which Booth refers to here is not one that our writing students invariably leave our classes with. The principal reason for this, I believe, is that we ourselves lack a conscious and explicit understanding of the syntactic and semantic properties of discourse connectives: a lack which I hope the present work can in large part remedy. For one of the central tasks involved in the teaching of composition is
for the teacher to articulate his understanding of what happens in the writing process to his students. But often, the teacher's own understanding remains on an intuitive level, and he has no way of making it available to the student in a usable form. As a result, the teacher often has to fall back on tactics which assume that the student has the same intuitions as himself: 'But can't you see (hear) what's wrong with this?'

The answer, too, often, is simply 'no', and the teacher's inability to be explicit simply heightens the student's general mystification, so that he leaves our courses feeling that writing is either beyond his abilities or just not worth his trouble. I have argued elsewhere (Warner 1979) for the merits of demystifying the writing process, for helping the teacher make his own knowledge of how language works conscious and explicit, and hence accessible to the student. And to himself: for by making his knowledge explicit, the teacher can develop methods for teaching various aspects of the writing process without depending on appeals to intuitions which it is our business to help the students develop. I will not attempt to develop such methods here. I would hope, however, that what I have had to say about discourse connectives in the present work is sufficiently explicit to provide a basis for the development of such methods.
Notes

1I am not personally convinced that conventional implicature, as defined in the present literature (e.g., by Karttunen and Peters, forthcoming), is a theoretically justified notion. I will not pursue this issue here, however, since my present concern is to show that even if there is such a thing as conventional implicature, it is not manifested by discourse connectives like those under discussion here.

2This ambiguity suggests that discourse connectives help us follow the cooperative principle in yet another way: since they allow us to avoid ambiguity, they enable us to satisfy the super-maxim of Manner: 'Be perspicuous' (Grice 1975:46). Moreover, on the analysis of and and at least given here, the following is impossible, since it depends on our holding two contradictory beliefs about the existence of irrational numbers:

*There are no irrational numbers. And at least that's what Professor Dumdum believes.
BIBLIOGRAPHY


________. Non-thematic subjects in contemporary English. TCLP 2:239-256.


Kantor, Robert Neal. 1977. The management and comprehension of discourse connection by pronouns in English. Unpublished Ph. D. dissertation. The Ohio State University, Columbus, Ohio.


Kempson, Ruth M. 1975. Presupposition and the delimitation of semantics. Cambridge: Cambridge Univer-


