

22692707

0245618



This is to certify that the
thesis entitled
A SEMANTIC EXPLORATION
OF LEXICAL DOUBLETS
presented by
David Joseph Kathman

has been accepted towards fulfillment
of the requirements for

M. A. degree in Linguistics

David M. Lockwood
Major professor

Date May 17, 1989



RETURNING MATERIALS:

Place in book drop to remove this checkout from your record. *FINES* will be charged if book is returned after the date stamped below.

FEB 25 1991

J-6

A SEMANTIC EXPLORATION OF LEXICAL DOUBLETS

by

David Joseph Kathman

A THESIS

**Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of**

MASTER OF ARTS

**Department of Linguistics and Germanic, Slavic,
Asian and African Languages**

1989

5679138

ABSTRACT

A SEMANTIC EXPLORATION OF LEXICAL DOUBLETS

By

David Joseph Kathman

This thesis examines the behavior of lexical doublets in English, defined as pairs of verbs which refer to the same action or situation, but differ in the syntactic position of two or more nominal arguments. The focus is on three-place doublets, i.e. those having three nominal arguments; oft-cited examples are 'sell'/'buy' and 'give'/'receive'. After a survey of previous work on lexical doublets, a stratified model of language is presented, including a creative semantic level in which similarly structured conceptual domains are seen as belonging to parallel semantic "fields". There follows a survey of English three-place verbs (those having both indirect and direct objects), and it is suggested that all such verbs capable of forming doublets have a conceptual "path" present, either of whose endpoints can be realized syntactically as the subject (subject to restrictions according to the semantic field involved).

**Copyright by
DAVID JOSEPH KATHMAN
1989**

TABLE OF CONTENTS

	List of Figures	v
1	Overview and Goals	1
2	Background	3
3	Assumptions	13
3.1	The model in general	13
3.2	Nodes	15
3.3	Strata	17
3.4	A few words about processing	20
4	The semantic stratum	21
4.1	The nature of semantic structure	21
4.2	Semantic fields	27
5	Three-place verbs and lexical doublets	30
5.1	Defining terms	30
5.1.1	Lexical doublets	30
5.1.2	Three-place verbs	33
5.2	Types of three-place verbs	34
5.2.1	"Sell" type	35
5.2.2	"Throw"-type	44
5.2.3	"Bring"-type	48
5.2.4	Abstract transferee: "Teach"-type	50
5.2.5	Other abstract transferees	54
5.2.6	Non-doublet-forming three-place verbs	60
5.2.7	Other uses of "give"	64

TABLE OF CONTENTS (continued)

6	Summary and Conclusions	69
	Appendix: Diagrams of some conceptual traces	72
	Bibliography	76

LIST OF FIGURES

Figure 1. Fillmore's diagrams for 'buy' and 'sell'	8
Figure 2. A stratificational model of language	14
Figure 3. Stratificational node types	15
Figure 4. Part of a conceptual tactic diagram	26
Figure 5. Conceptual traces of two sentences	27
Figure 6. Semological traces of two sentences	32
Figure 7. Conceptual representation for 'x sells y to z'	41
Figure A1. 'John threw Mary a cantaloupe'	72
Figure A2. 'Pete told me a joke about phoneticians'	73
Figure A3. 'Being on trial taught Ollie a valuable lesson'	74
Figure A4. 'Bill gave Leopold a black eye'	75

1. Overview and goals

There are a number of interesting questions which have come up fairly often in linguistic discussions over the years, but have defied simple analysis. One such problem is the analysis of what Dowty (ms) calls 'lexical doublets' -- pairs of verbs which can be used in sentences describing the same situation, but with the participants in different syntactic positions. One type of doublet is illustrated by the verbs in the following pairs of sentences:

- 1) a. Roman sold an ostrich to Noam.
 b. Noam bought an ostrich from Roman.
- 2) a. Agnes gave a warthog to Bill.
 b. Bill received a warthog from Agnes.

In both of these cases, the first sentence entails the second; if Roman sells an ostrich to Noam, it must also be true that Noam buys an ostrich from Roman. In addition, the participants involved are the same in each pair; the difference is in the syntactic positions occupied by these participants. Intuitively, each pair of sentences describes the same event, with either of two arguments capable of being realized as the subject.

Not all similar states of affairs can be realized in more than one way, however. For instance, one might be tempted to say that 'throw' forms a doublet with 'catch', but on further reflection this is not quite so. For one thing, it is awkward to use 'catch' with three arguments (cf. ?Roman caught the armadillo from Noam, although some authors, such as Gruber (1976), apparently find no difficulty with this construction). Also, Noam threw the armadillo to Roman does not

entail Roman caught the armadillo; Roman might have dropped it. Furthermore, there are some three-place verbs (i.e. verbs which take an indirect as well as a direct object) which do not even form pseudo-doublets similar to 'throw'/'catch'; there do not seem to be any partners for such syntactically analogous verbs as 'owe', 'deny', and 'promise'.

This thesis will explore these verbs in the context of a general model of language with an emphasis on their behavior in lexical doublets. More specifically, it will address the question implicit in the above paragraph: Why is it that some three-place verbs (e.g. 'sell') appear in doublets, others (e.g. 'throw') appear in "pseudo-doublets", and others (e.g. 'owe') do not appear to be paired with any similar verb at all? Another way to look at this question is in terms of "subject selection" principles, such as those found in Fillmore (1968), which determine which of a verb's arguments will be lexicalized as the subject of the sentence. In which situations (e.g. a commercial transaction) can either of two participants be realized as the subject, and in which similar situations (e.g. person A promising something to person B) can only one participant be so realized? In order to answer these questions, recourse to semantics appears to be inevitable, since these verbs' syntactic behavior is identical or nearly so. Thus part of this thesis will be devoted to outlining a plausible semantic theory, followed by application of this theory to three-place verbs and doublets involving them in order to better understand such constructions. The main focus will be on describing the situations where doublets do and do not occur, since few previous analysts have

considered the full range of three-place doublets in any detail. Some partial explanations will also be offered, although many questions will have to be left unanswered for now.

A caveat may be in order here. Obviously the sentences Noam sold an ostrich to Roman and Roman bought an ostrich from Noam are not freely interchangeable; they focus on different participants, and they would usually be used under different circumstances. Lexical doublets need not be pragmatically and stylistically the same; in fact, they generally are not, since otherwise they would be redundant. What is important is that they refer to the same event or state of affairs; we are interested only in the fact that two separate, syntactically different verbs exist in English to describe this event or state. The pragmatic differences between 'buy' and 'sell' are certainly worthy of study, but these differences are beyond the scope of this thesis.

2. Background

Before we start any analysis of lexical doublets, it will be a good idea to see what other linguists have had to say about them. Pairs such as 'buy'/'sell' have been mentioned over the years in discussions of semantics, and a number of different approaches have emerged. In some cases, there are merely observations, with little or no attempt at formal analysis, but numerous authors have tried more structured approaches. The following account is only a sample of some representative analyses, since an exhaustive catalog of all the different attempts to deal with lexical doublets would be very large indeed.

The early days of transformational grammar saw several attempts to relate doublets by means of transformations or information in the lexicon. These attempts generated some controversy at the time, although in retrospect they seem to be quaint artifacts of the heady, transformation- happy days of the 1960's. Lyons (1963) refers to doublets as "converse terms" and states: "The lexical substitution of 'buy' for 'sell', etc., can be thought of as associated with a set of automatic syntactic transformational rules, which carry the sentence containing 'buy' over into the corresponding sentence containing 'sell'" (1963:72). Staal (1967) goes on to suggest that such relations be incorporated into the lexicon. He proposes that the lexical entry for 'sell' should contain the following information:

(*sell*, [+V, +__NP {M}-to-NP {M, *buy-from* }])

where M indicates the possibility of passivization. This information would indicate that the sentences John sold the book to Mary and Mary bought the book from John are paraphrases. Bar-Hillel (1967) accepts some of Staal's conclusions but claims that the relations would be better handled by means of "meaning rules" of the type "For all X, Y, and Z, X sells Y to Z <--> Z buys Y from X" (based on Carnap 1956).

Several problems with the above analyses come to mind. First of all, treating the relationship between 'buy' and 'sell' as syntactic, as Lyons and Staal appear to do, stretches the definition of syntax to the breaking point (although such overzealous use of transformations was far from uncommon in those days). Katz (1972:296n) makes essentially the same objection, and Gruber (1976:42-3) points out a number of problems with an analysis in terms of transformations. All

three of the above analyses, furthermore, seem to invite redundancy; it would be better if we could come up with a general rule involving some kind of semantic feature of the verbs rather than having to provide a separate meaning rule for each related pair. Such arbitrariness makes it nearly impossible to answer the question posed by this thesis: what kinds of verbs, in general, can be related in this way?

In many instances, there has been an attempt to analyze doublets in terms of "cases" or "thematic roles", as popularized by Fillmore (1968) and elaborated in such works as Anderson (1971). Fillmore's widely-read article addresses the issue of subject-selection principles, but chiefly in terms of sentences containing the same verb accompanied by different sets of roles (e.g. A rock broke the window vs. John broke the window with a rock). His discussion of the verb 'give' in terms of these principles focuses on the various surface configurations involving this verb (John gave the books to my brother, The books were given to my brother by John, My brother was given the books by John), but unfortunately for our purposes here, he does not go on to explore the relationship between pairs like 'give' and 'receive' in terms of case grammar.

Subsequent work in many varieties of case grammar did sometimes try to analyze doublets; as a result of this and similar developments, many case grammarians began assigning multiple cases (or "roles") to single arguments in an effort to capture generalizations. Longacre (1976), for instance, presents a system whereby 'sell' and 'buy' both have case-frames involving a Source, Goal, and Patient, the difference

being that 'sell' assigns an additional Agent case to the Source, while with 'buy', the Goal is the Agent. Anderson (1971) proposes a similar system, though his terminology is totally different (e.g. 'ergative', 'ablative', and 'locative' for Agent, Source, and Goal).

Recognition of limits on the assignment of multiple roles led some subsequent researchers to posit disjunct "levels" or "systems" of cases. For example, Van Valin and Foley (1980) have two different case systems in their model: "derived" (corresponding to traditional roles such as agent, patient, and instrument) and "basic" (consisting of an opposition between just two roles: Actor and Undergoer). Thus in analogous pairs of sentences containing 'sell' and 'buy' (John sold the book to Mary/Mary bought the book from John), the participants would have identical roles in the derived system, but would differ in the basic system as to which participant is the Actor. This does help account for the intuitive semantic similarity of such sentences, but it does not address the question of why some verbs and not others can be paired in such a way. Various other authors, such as Dik (1980) and Culicover and Wilkins (1986) have made similar proposals for multi-tiered role systems.

Katz (1972) devotes an entire chapter to lexical doublets (which he calls "converses"), and he develops a very complicated formalism for handling the time relations involved. (Katz's chapter is an expansion of some ideas sketched in Katz 1967.) Essentially, Katz sees a verb such as 'sell' as referring to a series of states, each connected to an index representing a point in time; no thematic relations as such are involved. Since he assumes an interpretive view of semantics, he sees

the problem as: how do we make sure that the semantic interpretations of, say, "John sold the book to Mary" and "Mary bought the book from John" are the same, at least in terms of truth conditions? His solution involves variables in the semantic interpretation of the verb and conditions for the replacement of those variables with semantic interpretations of the various noun phrases in the sentence. In greatly simplified terms, part of the semantic interpretation of 'sell' would be "X possesses Y at time i; Z possesses Y at time j", where j is later than i, and part of the interpretation of 'buy' would be "Z possesses Y at time i; X possesses Y at time j". The variables X, Y, and Z above stand respectively for the subject, direct object, and indirect object of the sentence's deep structure; the semantic readings of the appropriate noun phrases are then substituted in, with the resulting semantic interpretations being identical for the 'buy' and 'sell' sentences. This analysis does have its attractive points, such as its attempt to decompose the meanings of the verbs in order to account for regularities, but on the other hand it is formidable in its complexity.

In contrast to Katz's extreme attention to detail, Fillmore (1977) presents an informal but intuitively appealing proposal involving the "scenes" associated with utterances. He points out that many verbs presuppose things about the context in which the action occurs; for example, the verb 'write' implies the existence of a trace-leaving implement going over a surface, and the result of the activity is presumed to be linguistic in nature. He then goes on to present an informal notation system to show the relationship between the syntax

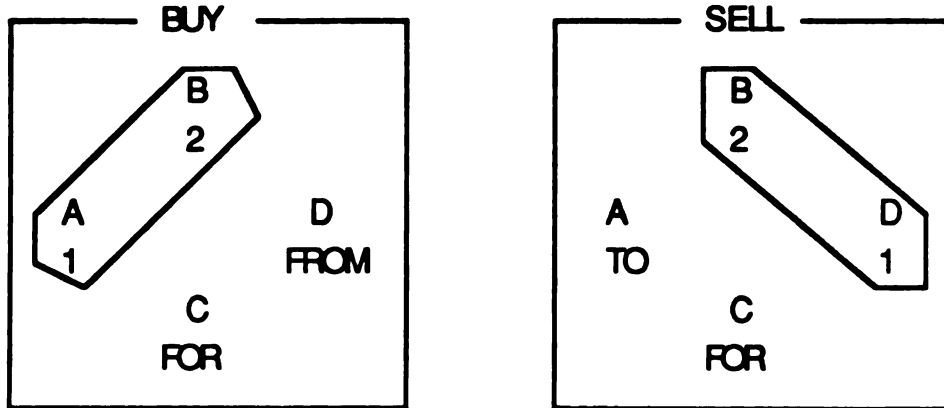


Figure 1. Fillmore's diagrams for 'buy' and 'sell'

of an utterance and its scene. As an example he uses a commercial transaction, which can be described using the old standbys 'buy' and 'sell' as well as a variety of other verbs such as 'spend', 'charge', and 'cost'. Figure 1 illustrates some verbs describing such a transaction. Here A, B, C, and D stand respectively for the buyer, the seller, the money, and the thing being sold; the numbers 1, 2, and 3 stand respectively for the subject, object, and indirect object of the sentence, with appropriate prepositions indicating non-central participants.

Jackendoff (1972) also briefly considers lexical doublets (using the standard example 'buy'/'sell'), and his discussion there is a prelude to his later, more fully developed ideas. He starts out by considering an analysis in terms of thematic roles similar to Longacre's, but rejects

it in favor of a partial decomposition of the meanings of the verbs into the functions CAUSE and CHANGE, with a system of indexing similar to Katz's variables relating the semantic and syntactic structures. In such a system, the notion of Agent or Source is not primitive, but is defined as a relation in semantic structure. In later writings, Jackendoff further refines the idea of semantic decomposition along lines developed earlier by such authors as Gruber (1976) and Miller and Johnson-Laird (1976). Jackendoff (1983 and 1987a) presents a system in which many abstract areas of the conceptual system have an internal organization parallel to that of more concrete areas; for instance, notions of relations in time ("It happened at 6:00"; "We moved the meeting from Tuesday to Wednesday") have a semantic structure parallel to that for spatial relations ("It happened at John's house"; "We moved the table from the living room to the dining room"). This concept will be explored in more detail later, but as an illustration, the semantic structure for 'buy' would be roughly the following in Jackendoff's revised system:

$$\begin{array}{c}
 \text{[Event CAUSE ([Thing}x\text{], Event GO}_{\text{Poss}} \text{([Thing}y\text{), } \text{FROM}_{\text{Poss}} \text{([Thing}z\text{])))]} \\
 \text{Path TO}_{\text{Poss}} \text{([Thing}x\text{])} \\
 \text{GO}_{\text{Poss}} \text{([Thing}\$ \text{), } \text{FROM}_{\text{Poss}} \text{([Thing}x\text{]))} \\
 \text{Path TO}_{\text{Poss}} \text{([Thing}z\text{])}
 \end{array}$$

(The symbol '\$' means that the element in question must be a sum of money, and the variables x, y, and z stand for entities in the mental world of the language user.) The idea of semantic fields, in the sense used by Jackendoff, will play an important part in the analysis presented below. Furthermore, Jackendoff discusses possible

constraints on how semantic representations may be lexicalized; although he does not specifically address the issue of lexical doublets as defined above, his comments will provide fertile ground for discussion.

There is, however, one further proposal involving lexical doublets which we must consider: the very interesting one given in Dowty (ms). Dowty's discussion of doublets is part of a larger argument involving thematic roles; he complains that current work involving roles is often idiosyncratic and inexact, and he makes some radical suggestions for remedying the situation. Essentially, what Dowty proposes is that instead of traditional roles such as Agent, Patient, Recipient, etc., there are just two proto-roles, (Proto-) Agent and (Proto-) Patient. These are defined in terms of sets of prototypical characteristics rather than necessary and sufficient conditions, so that an argument can be Agent-like or Patient-like to various degrees; whichever of a verb's arguments is the most Agent-like will be realized as the grammatical subject, and whichever is the most Patient-like will be realized as the direct object. The Proto-Agent characteristics given by Dowty (ms) are:

- a. volition
- b. sentience (and/or perception)
- c. causes event
- d. movement

and his Proto-Patient characteristics are:

- a. change of state (including coming to and going out of being)
- b. incremental theme (i.e. determinant of aspect)

c. causally affected by agent

d. stationary (relative to movement of Proto-Agent)

It is possible for more than one argument to have properties from one of the above lists; but according to Dowty's theory, whichever argument has the most Proto-Agent properties entailed by the meaning of the predicate will be lexicalized as the subject, and whichever has the most Proto-Patient properties entailed will be the direct object.

What happens when two arguments have an equal number of Proto-Agent characteristics? It is in such a case, Dowty claims, that we get lexical doublets, since either argument can be realized equally well as the subject. As an example, consider the following pair of sentences, which illustrate a three-place doublet:

3) a. John sold the book to Ethelred.

b. Ethelred bought the book from John.

In these sentences, John is entailed to be sentient (Proto-Agent property b) and to act volitionally (property a) and causally (property c); however, Ethelred appears to have the same properties, since a commercial transaction such as this presumably requires the mutual consent of the two parties. Since there seem to be no other relevant entailments involved, and each argument has an equal number (three) of Proto-Agent properties, either argument can be realized as the subject. Two-place doublets such as 'like' and 'please' can be analyzed in a similar way, according to Dowty. In a pair such as John likes bon-bons/Bon-bons please John, 'John' is presumably sentient, while the bon-bons are causing a reaction in John; since these are both Proto-Agent properties, either argument can occur as the subject.

On closer inspection, however, the above explanation of three-place doublets runs into some problems. While this theory seems to work for 'buy' and 'sell', it fails to account for similar doublets. Consider the following sentences, whose verbs form a doublet:

4) a. Ron gave Mikhail a rubber chicken.

b. Mikhail received a rubber chicken from Ron.

Ron, in these sentences, appears to have the three Proto-Agent properties mentioned above: volition, sentience, and causation. Mikhail, on the other hand, does not need to be either volitional or causative; he can be an entirely passive participant. Thus it appears that either Ron or Mikhail can be lexicalized as the subject, even though the former has three of Dowty's Proto-Agent characteristics while the latter has only one. Dowty recognizes this as a problem and tentatively suggests some explanations in terms of these verbs being few in number and acquired later by children than other verbs. Admittedly there might be some way to revise the theory to better account for this type of case, and overall Dowty's proposal is intriguing, but the situation is actually more complicated than it seems from Dowty's examples. This thesis will thoroughly explore the various types of three-place verbs and doublets in semantic terms, and will attempt to at least lay the groundwork for a more adequate explanation of the existence of lexical doublets.

3. Assumptions

3.1 The model in general

The linguistic model used in this thesis is a form of stratificational grammar (SG), although it differs in some respects from many of the models which have borne that name in the past. The term "stratificational", in the broad sense, means "having more than one creative, autonomous level of structure." By this definition, both tagmemics and systemics are broadly stratificational, since they explicitly recognize independent principles of organization for such levels as grammar and phonology (Pike & Pike 1976, Halliday 1985). On the other hand, neither classical transformational grammar nor government and binding theory are stratificational, since they treat syntax as the only creative component of a grammar, with semantics and phonology being interpretive components (Chomsky 1965 and 1981). In recent years, however, some generativists have abandoned syntactocentrism in favor of a more stratificational approach. For example, Jackendoff (1983: 9) presents a bistratal view in which semantics is creative and independent of syntax, but phonology is still interpretive; in Jackendoff (1987a) he claims the autonomy of phonology as well, resulting in a tri-stratal system. McCawley (1988) includes in his version of generative grammar "gross surface combinatorics", which are essentially tactics specifying the surface order of constituents, independent of the unordered underlying structures he also includes in his model.

Figure 2 is a broad sketch of the model of language used in this thesis. There are four strata, each of which contains a tactic pattern

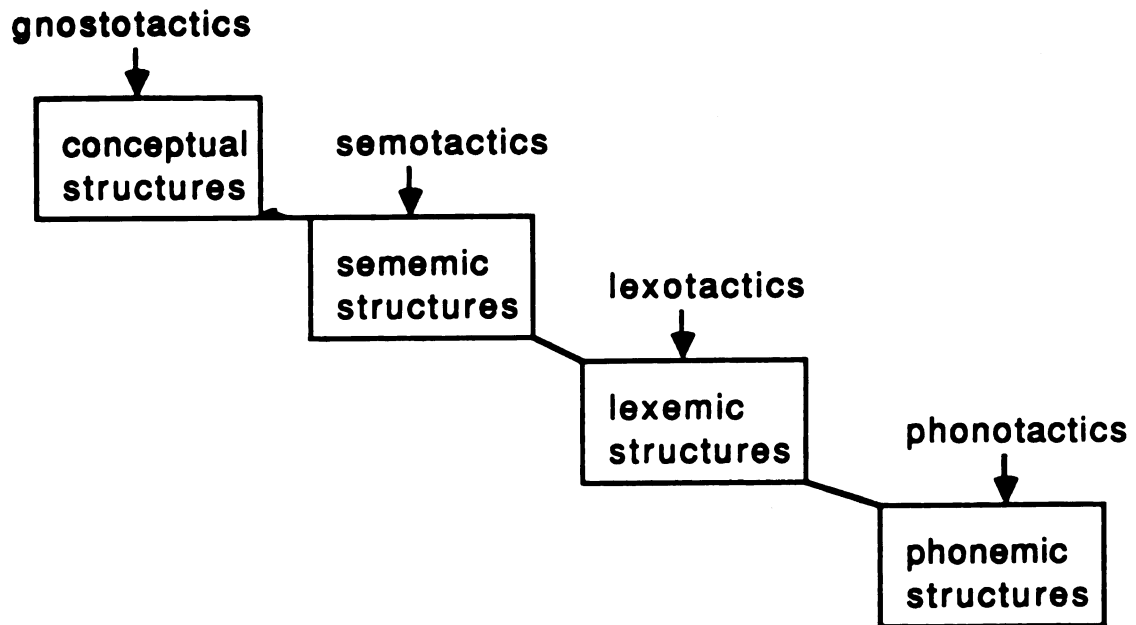


Figure 2. A stratificational model of language

specifying the well-formed structures of that level; these are connected by alternation patterns (represented here by double-headed arrows) which specify the correspondences between adjacent strata. (Arguments for independent patterning at various levels of language can be found in Lockwood 1972: chapter 2, Jackendoff 1987b: chapter 5, and McCawley 1988: chapter 10). Both the tactic patterns and the alternation patterns are networks of relationships, usually represented graphically by means of lines and nodes; the points where the tactic patterns and the alternation patterns intersect are known as 'emes', since they correspond roughly to traditional morphemes, phonemes, etc. For the sake of clarity, some explanation of the system and its formalism is given below, though this formalism will generally not be a crucial part of the analysis which follows.

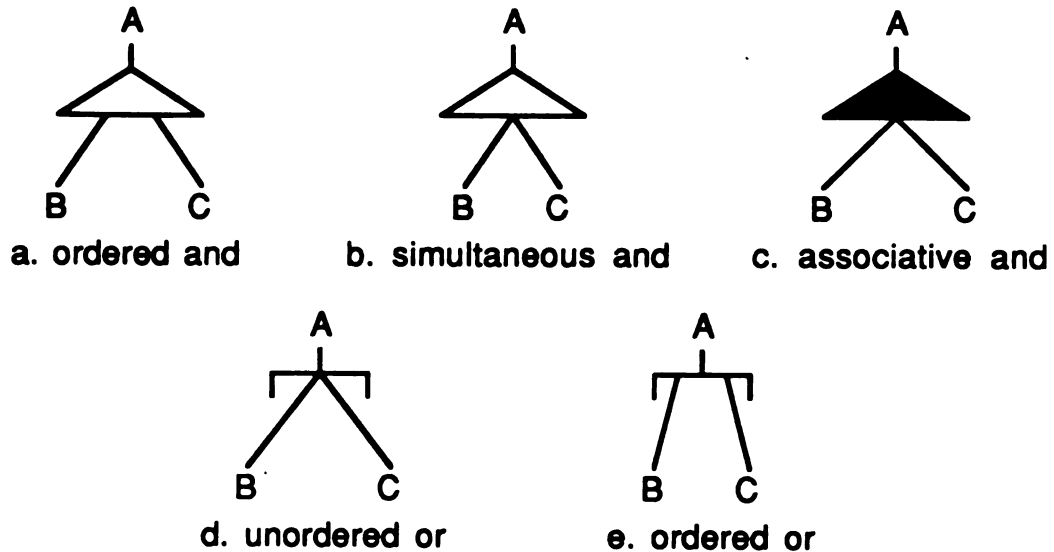


Figure 3. Stratificational node types

3.2 Nodes

Graphic representations of the major types of nodes are shown in Figure 3. Four types of nodes have traditionally been recognized in SG -- ordered and, simultaneous and, ordered or, and unordered or. (See, for instance, Lamb 1966 or Schreyer 1980). Other nodes have been proposed at various times by various people, and some of these may be necessary. (Christie 1977 presents an especially long list of nodes, some of them quite esoteric.) The present work will introduce just one node beyond the basic four -- an associative and, represented by a black triangle (Lockwood ms).

The three triangular nodes (3a-c) are syntagmatic nodes, meaning that they specify how two or more elements are related to one another in combination. With the ordered and, this relationship is linear order;

Figure 3a says that B precedes C. Figure 3b, a simultaneous and, specifies that B and C occur simultaneously. This would be used, for example, to specify the relationship among the members of a bundle of phonetic features; in this thesis, it will be used mainly for the relationship between a part of a tactic pattern and a label. The associative and of Figure 3c says that B and C are not simultaneous in terms of processing, but there does not seem to be any justification for ordering them. This node is used mainly in the semotactics and gnostotactics, where linear order does not come into play but dominance relations must be specified.

The next two nodes are paradigmatic nodes, representing a choice among two or more alternatives. Figure 3d, an unordered or, specifies that either B or C, but not both, occurs. The ordered or, shown in Figure 3e, says that B occurs only if its line has been "activated" from elsewhere in the linguistic system, and otherwise C occurs. This node is used to handle things such as gender concord, but it will not be necessary for our purposes here.

As noted before, each stratum has a tactic pattern consisting of a hierarchically arranged network of these nodes. At the top of each tactic pattern is an initial symbol, usually represented by a small circle, and immediately below this is a node which dominates all the other nodes in the network. At the bottom of the tactic pattern are the terminal nodes or "emes" of that level -- for the lexotactics they are called lexemes, for the semotactics sememes, and so on. Every node between the initial symbol and the terminal nodes must have a singular side, which has one line coming from it, and a plural side, which has

two or more lines coming from it. If a node's plural side is oriented toward the initial symbol, it is an upward node; if the plural side points toward the terminal nodes, it is a downward node. Since tactic diagrams are generally drawn with the initial symbol at the top, downward nodes look like those in Figure 3; upward nodes are the same but upside down. It should be noted that it is possible in SG for a line to loop back up to a higher part of the diagram, usually to an upward or; this is how recursion is handled.

3.3 Strata

The number and functions of specific strata have varied in stratificational analyses of language, so some explanation of the system used here may be helpful. The topmost stratum (i.e., the one closest to meaning) is the conceptual (or gnostemic), which specifies how a potential utterance is organized in terms of some basic conceptual principles. Many of these principles are taken from the ideas of Ray Jackendoff (1983, 1987a, 1987b), though they have been adapted to stratificational notation so they will fit in with the rest of the system. Essentially, this level deals with the semantic relations holding between the various elements of a sentence or discourse, and the internal semantic structure of those elements. Such matters have received scant treatment within the stratificational paradigm compared to the attention given to more accessible areas of language such as phonology and morphology, but I believe the analyses presented here have some merit; I do not share the view of some linguists (e.g. Sampson 1980:157) that semantics must be anecdotal and vague.

The next stratum down from the conceptual is the sememic. A level of this name is included in most SG analyses, and it is usually described as part of semantics (e.g. by Lamb 1966:20 or Sullivan 1980:305). However, the sememic level proposed here is more properly part of syntax (as it is understood by most linguists); among other things, it specifies the number and type of arguments a given verb takes, as well as how different syntactic categories may be associated. For example, the fact that the verb 'put' requires two nominal arguments and a prepositional phrase argument would be specified in the semology; so would the fact that proper names in English do not occur with determiners except in very limited cases. One thing which is not specified in semology is linear order; in this way it differs from most versions of deep structure in classical transformational grammar.

The lexemic stratum is what determines the linear order of words and constituents; it also indicates the presence of semantically empty words such as *it* in *It is raining*. The lexotactics simply specifies the relative order (and, where relevant, hierarchical structure) of all the possible surface elements of a sentence; which of these elements occur in a given sentence has to be determined by the semology. In the terms used by McCawley (1980:174), semology more or less includes "semantic combinatorics" (i.e. the valence of verbs, etc.) while lexology includes "syntactic combinatorics" (i.e. linear order).

Of the level(s) below the lexology, little needs to be said here, since they are not directly relevant to the problem of lexical doublets. Most versions of SG have a morphemic stratum as well as a phonemic, but the diagram in Figure 1 shows only the latter. It seems that most, if

not all, of the phenomena generally considered morphological can be included as an extension of the lexology; Lamb (1983) explicitly argues for this position, and Jackendoff (1987a:372-3) makes a similar claim. I will leave the question open here, since it does not affect the analysis one way or another.

A few additional remarks about this model might be in order. Practitioners of SG have generally stressed that their system consists solely of relationships; such terms as "lexeme" and "phoneme" are merely convenient labels for points in a network, defined by their place in the network and having no existence as objects in their own right. This view will be assumed here, but with one stipulation: if the model is to be truly stratificational as well as capable of encoding and decoding, then the emes of each stratum must be fundamentally different from the other nodes in the system. Otherwise there will be no way to build structure on any single level, and if this is not possible there is no reason to have separate levels at all. (Indeed, Reich 1969, 1970 has presented a model based on relationships but lacking strata.) However, since different levels of structure appear to be desirable, I will assume that emes are not quite the same as the nodes described in section 2b above. One way of looking at them is as special nodes capable of "remembering" a signal during processing, so that a structure on a given level can be "built". Actually, terminology does not matter as long as we recognize that emes are fundamentally different from and and or nodes.

3.4 A few words about processing

Essentially the same inventory of nodes described above appears in the alternation patterns which link adjacent strata. (In actual practice there are probably some differences, but we need not worry about that in this brief survey.) The nodes of each stratum are connected by these patterns to the nodes of the strata above and below, mapping structures onto one another. In a fully specified stratificational system, each possible structure on a given stratum will be mapped onto one or more structures on each adjacent stratum; this system can thus be seen as a model of ideal language use ('performance') as well as of passive linguistic knowledge ('competence').

A processing model based on a model similar to the one presumed here is described and defended in chapter 6 of Jackendoff (1987b). Jackendoff's model has three strata (conceptual, syntactic, and phonological), and after discussing several alternatives, he proposes an interactive model of processing. In such a model, a given level need not be fully specified before it starts transmitting information to the next level, and both top-down and bottom-up processing occur simultaneously. For example, in speech perception, the part of phonological structure which has already been constructed generally is used to determine the syntactic structure; but in certain situations, the syntactic structure may be needed to determine part of the phonological structure. Such a situation might be a conversation in a noisy room full of people, in which the conversants "hear" words which have not actually been perceived by their ears, due to their brains unconsciously reconstructing the missing parts of the speech signal.

(Warren 1970 describes this phenomenon.) One part of the SG model which might have to be adapted to account for such phenomena is the bidirectionality of the lines in the alternation patterns; if both top-down and bottom-up processing are going on simultaneously, two separate unidirectional alternation patterns may be needed. Actually, such an idea has been proposed by some stratificationists; it is found, for instance, in the "micronode" notation described by Christie (1977), and dates back to unpublished work of Lamb from the late 1960's.

4 The semantic stratum

4.1 The nature of semantic structure

According to the sketch given above, semantics in the present model is presumed to be an autonomous level, with a structure determined by its own internal principles. What is the nature of this structure? Various linguists, including Gruber (1976), Miller and Johnson-Laird (1976), Jackendoff (1983, 1987a, 1987b), Rappaport and Levin (1988), and generative semanticists such as McCawley (1968), have argued that semantic structure can be fruitfully analyzed as containing semantic units organized in some principled way. These authors differ, though, as to how these units are arranged and how their structures relate to the rest of language. Following Jackendoff (1983) and Rappaport and Levin (1988), I will take semantic structure to be arranged hierarchically, in much the same way syntax is generally represented. A similar assumption was made by the generative semanticists (cf. McCawley's (1968) famous decomposition of 'kill' as 'cause to become

not alive'), but the present approach differs from early generative semantics in claiming that syntax and semantics are two separate, equally creative parts of language structure.

First, consider sentences involving spatial location and motion, such as the following:

- 5) a. Elvis is in Kalamazoo.
- b. Elvis went from Kalamazoo to Lansing.
- c. The mouse ran under the table.
- d. Mariys put the roast in the oven.

Jackendoff (1983) breaks the conceptual organization of these sentences into such elements as Places, Paths, Events, and Things, nested inside one another and related by "functions". (These are not necessarily functions in the mathematical sense, but semantic predicates; to avoid confusion on this point, the term "predicate" will henceforth be used where Jackendoff uses "function".) For example, sentence (5a) might have a semantic structure roughly as follows, using Jackendoff's notation:

$[_{State} BE ([_{Thing} ELVIS], [_{Place} KALAMAZOO])]$

This is a State as opposed to an Event; it contains the State-predicate BE, which takes two arguments: a Thing (the object or person being located) and a Place (the location of this Thing). With an Event, different predicates occur. One of these is GO, whose arguments are a Thing and a Path; this Path in turn contains one or more Path-predicates (such as FROM or TO), whose arguments are Places. This can be seen in the following representations of the semantic structure of (5b) and (5c):

[_{Event}GO ([_{Thing}ELVIS], [_{Path}FROM ([_{Place}KALAMAZOO])
TO ([_{Place}LANSING])))]

[_{Event}GO ([_{Thing}MOUSE], [_{Path}TO ([_{Place}UNDER ([_{Thing}TABLE])))))]

Another possible Event-predicate is CAUSE, whose arguments are a Thing (usually) and an Event, as in the semantic representation of (5d):

[_{Event}CAUSE ([_{Thing}MARLYS], [_{Event}GO ([_{Thing}ROAST],
[_{Path}TO ([_{Place}IN ([_{Thing}OVEN])))))]

The CAUSE predicate differentiates this sentence from The roast went into the oven, whose representation would correspond to the innermost Event above. Somewhat related to this is the predicate Jackendoff calls LET, to account for such sentences as Millard released the warthog from its cage as opposed to The warthog left its cage.

A few words of caution may be appropriate here. The above decompositions are not meant to be exhaustive; they only represent part of the meaning of an utterance, although it is an important part in many cases. The above formalism, even as it is most fully developed in Jackendoff (1983), does not distinguish among Bill went to the store, Bill ran to the store, Bill flew to the store, and Bill drove to the store; all reduce to roughly the following:

[_{Event}GO ([_{Object}BILL], [_{Path}TO ([_{Place}AT ([_{Object}STORE])))))]

It is difficult to know where to go from there in terms of decomposition. As many researchers (e.g. Fodor, Garrett, Walker, and Parkes 1980) have noted, semantic decomposition can only go so far before one runs into residue which does not seem to be decomposable any further without ad hoc devices. One well-known example is color

terms; after abstracting out a feature [+color], how do we distinguish 'red' from 'green'? And how should one distinguish 'run' from 'walk' and 'skip' using features? Katz and Fodor's (1963) solution was to call this residue a "distinguisher" and claim that it does not play any part in ambiguity or other formal properties of utterances; however, Bolinger (1965) pointed out that such formal properties sometimes do need access to material in the distinguisher. Some linguists (apparently including Fodor himself; see Fodor 1975) have thus decided that the whole idea of decomposition should be abandoned, since it is not sufficient to fully describe natural language meanings.

However, this negative conclusion is reached only if one assumes that a decomposition must be necessary and sufficient to describe a word's meaning. It may be that the differences between 'red' and 'green' or 'run' and 'trot' are to be found in other areas of cognition which complement a decompositional "calculus of thought". For instance, much has been written about the prototype model of word meanings (Rosch et al. 1976); it is easy to think that prototypes and decomposition are mutually exclusive, and that a choice must be made between the two. However, Jackendoff (1987b: chapter 10) discusses how something very similar to prototypes (based on Marr's (1982) 3-D model of visual structure) could be integrated with the lexical decompositions given above, and elsewhere (1983:ch. 7,8; 1989) he describes other systems which contribute to lexical meanings in a complementary way. I will assume that such systems exist to supplement the rough decompositions given below, and will thus not try to make these decompositions necessary and sufficient.

Jackendoff uses phrase-structure type rules to specify the possible combinations of conceptual categories, but these combinations can also be specified by means of a tactic diagram such as that shown in Figure 4. The associative and nodes in this diagram generally represent Jackendoff's States, Events, Places, Paths, and so on. Note that these are not labeled as such; the category a node belongs to is determined by its connections in the tactics. A node (such as the black one above GO in Figure 4) which leads downward to a choice of Things, a choice of predicates including GO, and a choice of Paths, represents, by definition, an Event. However, when there is more than one argument for a function, these arguments have labels (arbitrarily given as 'A' and 'B') so that they can be differentiated for the purpose of realization between strata. This is really a notational variant of Jackendoff's (and Miller and Johnson-Laird's) method of listing arguments in an arbitrary but fixed order; here, 'A' corresponds to his first argument and 'B' to his second argument.

This graphic notation can also be used to represent the conceptual structure of individual sentences, as seen in Figure 5. These conceptual traces are made from the full tactics by making choices at all or nodes so that only and nodes are left. Such traces are equivalent to the bracket notation introduced earlier; in order to save space, semantic structure will generally be represented here using bracket notation, eliminating any labels or brackets which are unnecessary for the immediate point being made. For instance, the traces in Figure 5 could be represented as follows:

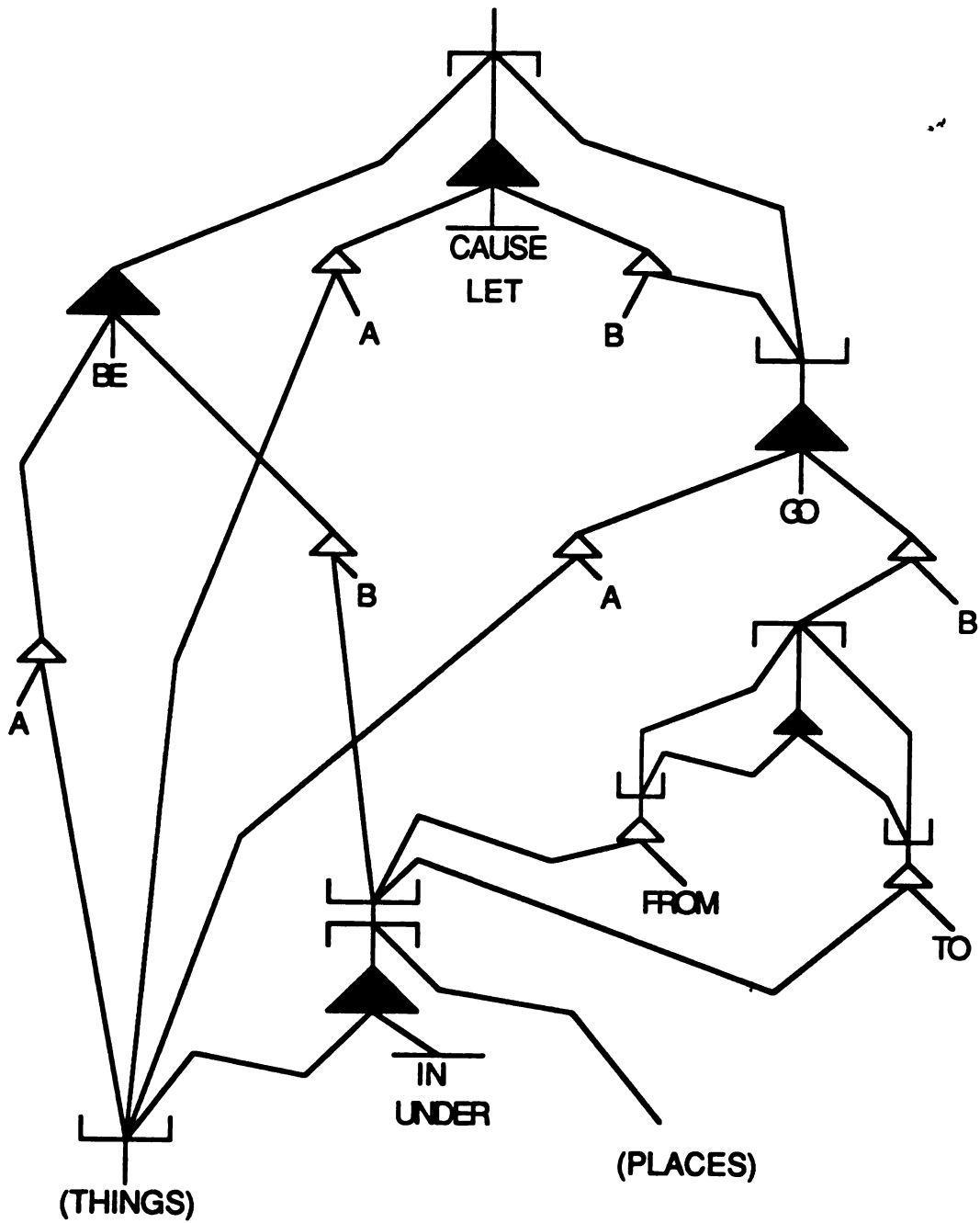
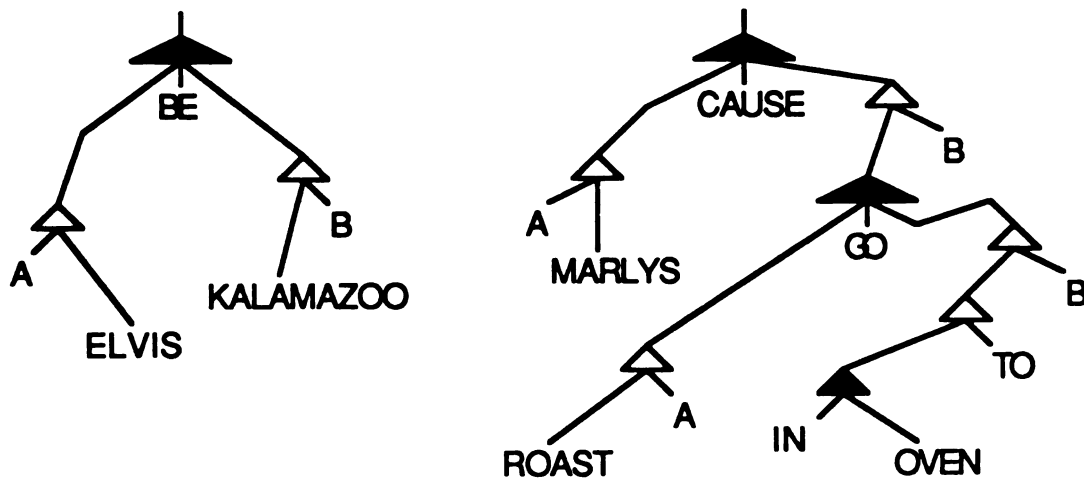


Figure 4. Part of a conceptual tactic diagram



a. Elvis is in Kalamazoo

b. Marlys put the roast in the oven

Figure 5. Conceptual traces of two sentences

[BE ([ELVIS], [KALAMAZOO])]

[CAUSE ([MARLYS], [GO ([ROAST], [INTO OVEN])])]

if it is obvious from the context what conceptual categories are involved and the condensed structure is irrelevant for the point at hand (cf. the fully specified representations of these sentences given earlier).

4.2 Semantic fields

All of the decompositions discussed above deal with the location and movement of objects in physical space. However, Gruber (1976) goes on to suggest that this same structure is used for more abstract domains. Consider the following sets of sentences (based on examples in Jackendoff forthcoming):

- 6) a. Elvis went from Kalamazoo to Lansing.
 b. Elvis is in the kitchen.
 c. Mary kept Elvis in her boudoir.
- 7) a. The prize went to Gilbert.
 b. The prize is Gilbert's.
 c. Gilbert kept the prize.
- 8) a. Susan went from happy to sad.
 b. Susan is happy.
 c. Chris kept Susan happy.
- 9) a. We changed the party from Tuesday to Saturday.
 b. The party is on Saturday.
 c. Let's keep the party on Saturday.

There are some obvious lexical and syntactic similarities here, even though these sentences are describing quite different things: the sentences in (6) describe physical location and motion; those in (7) describe possession; those in (8), properties of Susan; and those in (9), the scheduling of a party. As a guide to determining the semantics of such examples, this thesis will adopt an assumption about semantics which Jackendoff calls the Grammatical Constraint; this holds that "one should prefer a semantic theory that explains otherwise arbitrary generalizations about the syntax and the lexicon" (1983:13). We appear to have an instance of such generalizations here; a reasonable assumption would thus be that all these various domains are organized in parallel fashion, involving the same types of categories and principles of organization that we saw in the semantics of spatial expressions. If the conceptual organizations of the different domains

are similar, then the similarities seen above simply reflect this parallel organization.

In the terminology of Gruber (1976), the sentences in (6)-(8) are Positional, Possessional, and Identificational respectively; Jackendoff (1983) calls these "semantic fields" and refers to them as Positional, Possessive, and Identificational, adding Temporal for the sentences in (9). This terminology will be adopted here, except that Positional will be called Spatial and Possessive will be broken into several fields as discussed below. The categories involved are the same in each field, but they refer to a wide variety of things. For instance, the first sentence in each of the above trios seems to involve "movement" from one conceptual location to another. Again using Jackendoff's notation, conceptual representations of these sentences might be roughly as follows:

[Event GO_{Posit} ([Thing ELVIS], [Path FROM_{Posit} ([Place KALAMAZOO])
TO_{Posit} ([Place LANSING])]]]

[Event GO_{Poss} ([Thing PRIZE], [Path TO_{Poss} ([Person GILBERT])]]]

[Event GO_{Ident} ([Thing SUSAN], [Path FROM_{Ident} ([Property HAPPY])
TO_{Ident} ([Property SAD])]]]

[Event CAUSE ([Thing WE],
[Event GO_{Temp} ([Event PARTY], [Path FROM_{Temp} ([Time TUESDAY])
TO_{Temp} ([Time SATURDAY])]])]]

Notice that the arguments of the Path-predicates (FROM and TO) are of widely varying types, yet the overall structures of the representations are very similar. Here semantic fields are indicated by subscripts on

the predicate names, but nothing hinges on this notation; in fact, in this thesis fields will generally be indicated in the bracket notation (where relevant) by means of a single subscript outside the outermost bracket, in order to avoid undue clutter.

Why should conceptual information be organized in semantic fields? One answer is economy. In dealing with an abstract domain such as the ascription of properties to things, the mind does not have to create an entirely new structure; it merely takes over, with certain minor modifications, the structure used for a more concrete domain such as physical location. Actually, it is not necessary to think of the spatial field as more 'basic' than the others, although it is the most intimately tied to sensory information.

5 Three-place verbs and lexical doublets

5.1 Defining terms

With the above outline of the conceptual system in mind, we can now turn to the various three-place verbs in English and see what light a semantic analysis can shed on their behavior in forming doublets. First, though, it will be a good idea to define more precisely what we mean by a "lexical doublet" and a "three-place verb".

5.1.1 Lexical doublets

A preliminary definition of a lexical doublet for our present purposes might be as follows:

Two three-place verbs form a lexical doublet if: 1) they can be used in sentences containing exactly the same nominal arguments; 2)

these arguments do not all occupy the same syntactic positions in the two sentences; and 3) the sentences refer to the same event, which generally means that they entail each other.

Admittedly the third condition is somewhat subjective, but it should not cause too many problems. It is intended to distinguish between pairs such as 'sell'/'buy', which can generally be considered paraphrases except for the difference in focus, and pairs such as 'throw'/'catch', which refer to separate though related events and cannot always be used for the same situation. These differences will be discussed further below.

Note that there is no specification that the verbs have to be different; a single surface form can function as both halves of a lexical doublet, as in The landlord rented the crummy apartment to the students and The students rented the crummy apartment from the landlord. There is a problem, however, in that this definition, strictly interpreted, seems to say that the verbs in active-passive pairs and other similar variations are doublets. Although the noun phrases in such pairs differ in their surface position in the sentence, a transformational grammarian of the old tradition would say that they occupy the same positions in deep structure. In the most traditional stratificational terminology, the noun phrases in question are said to have identical semological roles, with the differences in surface position showing up in the lexology. This position will be adopted here, although with a change in terminology. Instead of the usual SG labels 'Agent', 'Patient', and 'Recipient', 'S', 'O', and 'I' will be used to refer to the arguments which in the most usual cases are realized as the

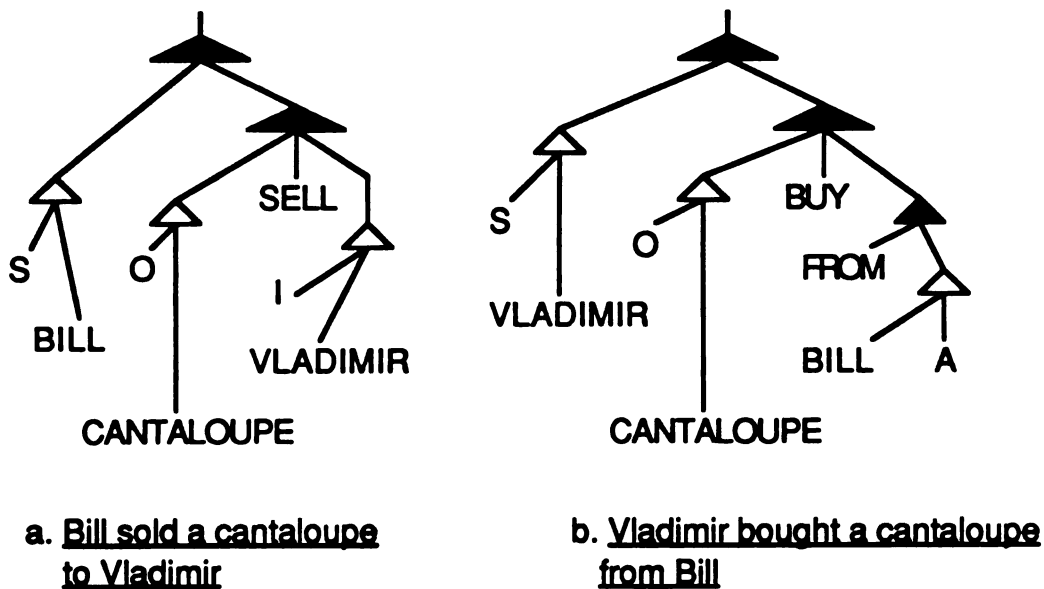


Figure 6. Semological traces of two sentences

subject, direct object, and indirect object respectively. This approach is empirically similar to one in which the arguments of a predicate are given in an arbitrary but fixed order (i.e. 'buy (x,y,z)'), in much the same way that the use of 'A', 'B', 'C', etc. to label arguments in conceptual structure parallels Jackendoff's arbitrary ordering of the same arguments.

As an illustration, Figure 6 shows semotactic traces corresponding to the sentences Bill sold Vladimir a cantaloupe and Vladimir bought a cantaloupe from Bill respectively. These show the semological structures of individual sentences, which in this case illustrate the doublet 'sell'/'buy'; they are specified from a semotactic diagram in the same way that the conceptual traces shown earlier in Figure 5 are specified from a conceptual tactic diagram. From this illustration it

should be evident how we can revise the definition given earlier: at least some of the nominal arguments associated with the verbs of a lexical doublet must have different semological labels. This condition is satisfied here, since both 'Bill' and 'Vladimir' have different labels in these two diagrams: Bill is 'S' in 6a and 'A' (for 'adjunct') in 6b, while Vladimir is 'I' in 6a and 'S' in 6b. In an active/passive pair such as Bill sold Vladimir a cantaloupe/Vladimir was sold a cantaloupe by Bill, the arguments would have identical semological labels in the two sentences (Bill and Vladimir would be 'S' and 'I' respectively in both sentences), with other factors such as focus accounting for the surface discrepancies.

5.1.2 Three-place verbs

The term "three-place verb" should be taken to mean a verb which takes both a direct and an indirect object; Green (1974) calls these "dative-movement verbs", but this term will be avoided here since it implies the existence of a dative-movement transformation. It is a well-known fact that in English, many indirect objects can occur either between the verb and the direct object (internal indirect object) or after the direct object in a prepositional phrase (external indirect object). However, there are some cases in which one of these generally seems less natural, as in the following examples:

- 10) a. I donated some clothes to the Salvation Army.
 b. ?I donated the Salvation Army some clothes.
- 11) a. ?John gave a punch in the eye to Bill.
 b. John gave Bill a punch in the eye.

We need not be overly concerned with such cases, since the acceptability of such "odd" sentences varies widely in different contexts and with different speakers; for the most part, internal and external indirect objects will be used interchangeably below. However, the following discussion will not deal with "for" datives, as found in such sentences as Melvin baked a cake for Hilda/ Melvin baked Hilda a cake. There do not appear to be any doublets which involve this construction, so for simplicity's sake we can ignore these verbs here.

In order to make the following discussion easier to follow, it may be a good idea to introduce some terminology here. In a pair of sentences such as Agnes gave a warthog to Bill/ Bill received a warthog from Agnes, 'Agnes' will be considered the Source and 'Bill' will be considered the Goal. These labels will not always be accurate in a literal sense, but they are a convenient way of referring to the appropriate noun phrases in a doublet. 'Warthog' will be referred to as the Transferee; again, this label will not always be literally accurate, but it is convenient. Gruber (1976) and Jackendoff (1983) use the term "theme" for the transferred item; unfortunately, the same term is used in systemic grammar (Halliday 1985) in a much different sense. In order to avoid undue confusion, the more neutral label "Transferee" will be used here instead of "Theme".

5.2 Types of three-place verbs

With the above definitions in mind, let us now turn to a survey of three-place verbs with a view to noting and explaining their behavior in terms of forming doublets. As it happens, Green (1974) contains a

fairly lengthy survey of three- place verbs, dividing them into classes based on rough decompositions of their meanings. Green proposes five general classes of three-place verbs (if we exclude the for-dative verbs as noted above); these resemble the informal classes noted by Jespersen (1933(1964):114). Green's classes can be used as a general guideline for our survey, although they will not be considered definitive.

5.2.1 "Sell"-type

One of Green's classes includes, among other verbs, 'sell' and 'rent'; each of these can be paired with another verb ('buy' and 'rent' respectively) to form a doublet:

- 12) a. Bill sold a cantaloupe to Vladimir.
- b. Vladimir bought a cantaloupe from John.
- 13) a. Mortimer rented the spare room to Esmerelda.
- b. Esmerelda rented the spare room from Mortimer.

As noted earlier, such pairs meet the conditions for a doublet: they contain the same nominal arguments, two of these arguments have differing semological labels (see Figure 6), and the sentences refer to the same event; it is difficult to imagine a situation where Bill sells a cantaloupe to Vladimir but Vladimir does not buy a cantaloupe from Bill. In fact, this last observation suggests a quick test for doublethood: if it is possible to conjoin one of the sentences involved with the negation of the other, and have the result be semantically well-formed, then the two verbs do not form a doublet. Thus the sentence ?Bill sold a cantaloupe to Vladimir, but Vladimir didn't buy it

is very odd, giving us evidence that 'sell' and 'buy' form a doublet; but the sentence Bill threw a cantaloupe to Vladimir, but Vladimir didn't catch it seems all right, suggesting that 'throw' and 'catch' should not be considered a true doublet. Admittedly this is not a perfect test, given the notoriously subjective nature of acceptability judgements, but it can nevertheless be helpful.

Among the other verbs which Green includes in the same class are 'give' and 'lend'. Both of these form doublets, as the following examples show:

- 13) a. Siegfried gave a new car to Susan.
- b. Susan received a new car from Siegfried
- 14) a. Kareem lent a pair of hightops to Michael.
- b. Michael borrowed a pair of hightops from Kareem.

The one thing which these verbs all seem to have in common is that they involve a transfer of possession. Notice that this does not necessarily mean that the thing being transferred actually moves in space. In the sentence Darlene just sold a house to Ingmar, it is hard to imagine the house actually going anywhere, yet this sentence is structurally identical to Darlene just threw a watermelon to Ingmar, in which it is difficult (if not impossible) to imagine the watermelon not moving. With the notion of semantic fields, though, these facts are easily explainable: 'sell' describes an event in the possessional field, while 'throw' describes an event in the spatial field. Movement in the former does not necessarily imply movement in the latter.

Actually, the situation is a little more complicated than that, since there are several different kinds of possession; Miller and

Johnson-Laird (1976:562-5) present a useful outline of these. First, there is the distinction between "alienable" and "inalienable" possession. Inalienable possession is inherent in the nature of the thing being possessed, and it cannot normally be transferred; the most common examples of this are family members ("my mother") and body parts ("my arm"), and it can also be used with inanimate subjects (The city has a beautiful skyline). Alienable possession is transferable; all the doublets noted above ('sell'/'buy', 'rent'/'rent', etc.) involve some sort of alienable possession. It thus turns out that doublets involving possession appear to always refer to alienable possession; because of this, inalienable possession will not be a major factor in our discussion.

However, there are also several different types of alienable possession. Miller and Johnson-Laird identify three such types: "inherent" (referring to ownership of something), "accidental" (referring to having temporary control of something without necessarily owning it), and "physical" (referring to the physical location of something in someone's hands or on their person). The pairs 'sell'/'buy' and 'rent'/'rent' differ in that the former refers to a transfer of inherent possession in exchange for money, while the latter refers to a similar transfer of accidental possession; in neither case is it necessary for there to be an actual transfer of physical possession. 'Give'/'receive' and 'lend'/'borrow' are parallel to 'sell'/'buy' and 'rent'/'rent', except that here there is no money involved. Katz (1972) notes that all four of these doublets involve a transfer of possession, but are distinguished by two parameters: whether or not a transfer of

money is involved, and what type of possession (inherent or accidental) is being transferred.

This is not quite accurate, though; 'give' can apparently refer to transfer of any of the three types of possession, as the following sentences demonstrate:

- 15) a. Bill gave a diamond necklace to Zelda on their anniversary.
 b. Harry gave his car to Phil for the weekend.
 c. Could you please give me that book that's on the table?

(In addition, 'give' can be used in more abstract ways, as in John gave Mary an idea or Bill gave Harry a cold, but discussion of these special cases will be deferred until later.) The three sentences in (15) refer to the transfer of inherent, accidental, and physical possession respectively. However, in the last two sentences above, there are synonyms which can be substituted for 'give' with no apparent change in meaning ('lend' in (15b) and 'hand' in (15c)), while no such synonym comes readily to mind for (15a). Also, I received a book from Bill seems odd if it refers to a situation where Bill simply handed me the book. If we substitute 'get' for 'receive', the situation does not change. 'Get' is ambiguous between an agentive and a non-agentive sense (roughly synonymous with 'obtain' and 'receive' respectively); if we interpret it in the non-agentive sense, it appears to only refer to a transfer of inherent possession. In other words, the sentence I got a book from Bill refers either to a situation where I actively obtained the book from Bill, or to one where the book was a gift from Bill to me; it does not refer to Bill simply handing me a book which I may already own (there is another potential reading of 'receive'/'get' in the sense

of, for example, receiving something in the mail; this will be discussed when we get to the Spatial field). Thus it does not seem unreasonable to consider the inherent-possession meaning of 'give' to be paired with 'receive' in a doublet, allowing it to fit into Katz's paradigm.

Given these four basic three-place doublets, similar pairs come to mind. 'Lease'/'lease' is obviously parallel to 'rent'/'rent', and for several of the other verbs it is possible to make a trivially new doublet by substituting a synonym: 'purchase' for 'buy', 'loan' for 'lend', etc. A number of pairs can be found which are similar to 'give'/'receive'. Such pairs include 'bequeath' and 'inherit' and possibly 'pay' and 'receive':

- 16) a. Bert bequeathed a million-dollar estate to Ernie.
 b. Ernie inherited a million-dollar estate from Bert.
- 17) a. Elmore paid Winston ten dollars.
 b. Winston received ten dollars from Elmore.

In the above situations there are selectional restrictions on the transferee, as well as various other conditions or presuppositions, but nevertheless these pairs appear to be doublets. In some cases (e.g. 'award', 'cede', as well as 'pay' above) verbs similar to 'give' do not seem to be pairable with anything other than (possibly) 'receive'; there are in fact considerably more verbs of the 'give' type than there are of the 'receive' type. Such a fact does not seem too surprising, since the source starts out possessing the transferee, and thus is better able to control any action involving its transference. We will see later that similar generalizations can be made about other types of three-place verbs.

How should this group of verbs be represented conceptually? First of all, we appear to be dealing with two abstract semantic fields, which we can call "inherent possessional" and "accidental possessional". The verbs discussed above seem to involve movement in one of these fields, from one possessor to another. Note that the only "locations" possible in these fields are not places in the usual sense of the word, but people (or, possibly, other animate beings: animals, personified organizations, etc.). Also, as Jackendoff (1983:192) notes, these locations are discontinuous. An object cannot be halfway between being possessed by John and possessed by Mary; it is possessed by one or the other, and so a transfer from one to the other can be thought of as instantaneous in conceptual terms (though in real life, of course, there is often physical movement of the object over a period of time).

With all this in mind, we might represent 'sell' as shown in Figure 7 and below in bracket notation (from now on, bracket notation will generally be used in order to save space, and diagrams of selected semantic representations can be found in the appendix):

[CAUSE ([Person^x],_{Inposs} [GO ([y], [_{Path} FROM ([Person^x]) TO ([Person^z])])])
[GO ([^{\$}], [_{Path} FROM ([Person^z]) TO ([Person^x])])])]]

This states that x (the subject of 'sell') causes two events in the Inherent Possessional field (abbreviated here as Inposs): y going from x to z, and some unspecified amount of money going from z to x. (The same representation could be used for 'rent' by changing the Inherent Possessional field to the Accidental possessional field.) The symbol '\$' indicates a selectional restriction on the secondary transferee; if it is

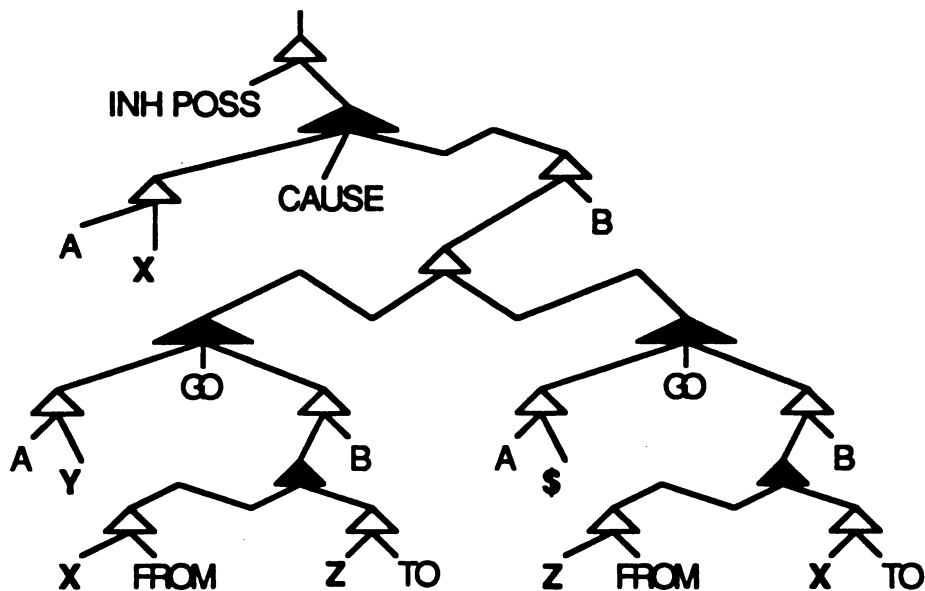


Figure 7. Conceptual representation for 'x sells y to z'

lexically expressed, it must be an amount of money, and if it is not, it is assumed to be present implicitly. (Jackendoff 1987a:384-7 discusses such restrictions in terms of "argument fusion".) Note that the arguments of the Path-functions FROM and TO are Persons, rather than Places. A Person, in this conceptual sense, does not have to literally be a person; it can be any volitional being, such as a person, an organization, an animal, or something similar. Persons are distinct from Things, which are physical objects. Compare the following pairs of sentences:

- 18) a. Bill hurled Mike through a plate-glass window.
 b. Mike owns three Cadillacs.
- 19) a. Bill hurled Mike's body through a plate-glass window.
 b. ??Mike's body owns three Cadillacs.

The word 'Mike' in (18) seems at first glance to be referring to same thing in both sentences, but as (19) shows, this is not quite true. 'Mike' can refer either to a physical entity located in space, in which case it is conceptually a Thing, or to a volitional entity capable of possession (among other things), in which case it is conceptually a Person. The 'locations' in the Inherent Possessional field can thus be considered Persons, since Things are incapable of inherent possession.

'Buy' can be represented conceptually as follows:

[CAUSE ([Person_z], Inposs [GO ([y], [Path FROM ([Person_x]) TO ([Person_z])])])]
[GO ([\\$], [Path FROM ([Person_z]) TO ([Person_x])])])]

(The second sense of 'rent' could be represented in the same way, but in the Accidental Possessional field.) This is exactly like the representation for 'sell' except that z, rather than x, is seen as initiating the action and is thus the first argument of CAUSE. Note that in both cases, the participant who appears in this position is lexicalized as the unmarked subject, or, in the terminology being used here, is realized in the semology as 'S'. Thus we might tentatively say that a doublet occurs when two conceptual representations are the same except for the initiator of the action; whichever participant is the first argument of CAUSE will be realized as 'S'.

However, consider the following conceptual representation:

[CAUSE ([Person_x], Inposs[GO ([y], [Path FROM ([Person_x]) TO ([Person_z])])])])]

Such a situation might conceivably be described by either x gives y to z or z receives y from x; in both cases the same person initiates the action, although this fact is more central in the case of 'give'. In fact, it is probably more appropriate for 'receive' not to involve the CAUSE

predicate at all, so that z receives y from x would be something like this:

$\text{Inposs}[\text{GO}([y], [\text{Path} \text{ FROM } ([\text{Person } x]) \text{ TO } ([\text{Person } z])])])]$

This is essentially the representation Jackendoff (1983:192) uses for 'receive', and it seems intuitively plausible. (Note that it is possible to not mention the initiator at all, as in John received an armadillo; in such a case, the FROM predicate would simply not be a part of the conceptual representation.) Yet the above representation does not allow our tentative subject selection principle to work, since there is no CAUSE predicate; there is thus no way to tell which argument is realized as the unmarked subject.

Furthermore, consider the following representation of 'take', as in x takes y from z:

$[\text{CAUSE}([\text{Person } z], \text{Inposs}[\text{GO}([y], [\text{Path} \text{ FROM } ([\text{Person } x]) \text{ TO } ([\text{Person } z])])])])]$

This is identical to the above representation of 'give', except that z, rather than x, causes the action; in other words, the goal rather than the source is the initiator. Also, just as 'receive' can be paired with 'give', 'lose' can be compared with 'take', as in the following sentences:

- 20) a. France took Alsace-Lorraine from Germany.
 b. Germany lost Alsace-Lorraine to France.

With both 'lose' and 'receive', there does not seem to be any overt causation involved, since the focus is on the non-controlling participant and the presence of the causer is optional (John received an armadillo, Germany lost Alsace-Lorraine). A conceptual representation for x loses y to z thus might be as follows:

$\text{Inpos}_s[\text{GO} ([y], [\text{Path} \text{FROM} ([\text{Person } x]) \text{ TO } ([\text{Person } z])])])]$

Note that this is the same representation proposed above for z receives y from x. If this is the case, then there is a double problem for the idea that only the initiator of an action is realized as the subject. On the one hand, as we noted before, there is no CAUSE predicate above to determine the subject; on the other hand, in the absence of such a predicate, either of two participants (x and z in the above example) can be realized as the subject.

There is another way of looking at the problem which seems more promising. Notice that in all the above examples, each of the possible subjects is one of the endpoints of the Path taken by the transferee. The argument of FROM loses possession of the transferee, while the argument of TO gains possession; there is a kind of reciprocal relation, especially if we think of the transfer as a single, instantaneous event. As a general rule, we could say that either endpoint of a Path in a Possessional field can be realized semologically as the 'S' argument (i.e. the one which will appear as the grammatical subject in the most usual cases) without necessarily being the initiator. Before we try to elaborate any further, though, it might be a good idea to look at some other types of three-place verbs and see how they relate to the above discussion.

5.2.2 "Throw"-type

One of Green's categories contains many verbs which form 'pseudo-doublets'; that is, they meet the first two criteria for doublethood, but do not refer to exactly the same event. One example which has been

mentioned several times already is 'throw'/'catch'. Throwing a ball to someone does not necessarily mean that they will catch it; we have already seen that it is reasonable to say Bill threw a cantaloupe to Vladimir, but Vladimir didn't catch it. Similar statements could be made about such pairs as 'send'/'receive' or 'mail'/'receive' (cf. I mailed Bill a letter but he never received it).

Some of the verbs put in this class by Green ('roll', 'fling', 'forward', etc.) do not seem to form pseudo-doublets except possibly with 'catch' or 'receive'. This is much like the situation with Possessional verbs, in that there are more distinct verbs with a source subject (e.g. 'send') than there are verbs with a goal subject (e.g. 'receive'). A related observation is that the source appears to be the unmarked initiator; there are more verbs where the source causes the action ('give', 'send') than there are where the goal causes the action (e.g. 'take'). It is difficult, for example, to find a goal-initiator verb corresponding to 'send' or 'throw' in the same way that 'take' corresponds to 'give'; presumably this is because of the difficulty of exerting control over something from which one is separated in space. ('Send for' is a possibility, but it is two words and introduces additional complications, such as an implied third party.)

Despite our revised subject selection principle, it is still the case that the initiator, if it is specified in conceptual structure, is realized as semological 'S'. Thus the above generalizations are related and can be collapsed; if the source is more likely than the goal to be the initiator, and the initiator is always realized as unmarked subject, it follows that the source is more likely to be the unmarked subject. It

is still possible for the goal to be the initiator, but such cases are relatively unusual.

There are numerous pieces of evidence for placing the 'throw' group of verbs in the Spatial (Jackendoff's Positional) semantic field. One is that the transferee must actually move in physical space; it is impossible to make sense of X throwing a ball to Y if the ball remains stationary. (On the other hand, we have seen that it is perfectly possible to sell something without that thing moving at all.) Because of this, the events described by the members of a pseudo-doublet such as 'throw' and 'catch' are necessarily separated in time; this explains why one of these events can be negated without making the sentence anomalous (Bill threw a cantaloupe to Vladimir, but Vladimir didn't catch it). Also, note that verbs such as 'send' and 'throw', unlike 'sell' and 'give', can normally be used with any directional prepositional phrase, and are parallel in this regard to spatial uses of 'go':

- 21) a. Bill threw the ball into the ravine.
- b. ?Bill sold the ball into the ravine.
- c. Bill went into the ravine.
- 22) a. Lisa sent the package out of the country.
- b. ?Lisa gave the package out of the country.
- c. Lisa went out of the country.

There is, however, a restriction: the subject of a verb like 'receive' must normally be a Person. Note the following:

- 23) a. Johann sent a package to Kate.
- b. Kate received a package from Johann.

24) a. Johann sent a package to New York.

b. ?New York received a package from Johann.

A sentence such as (24b) seems to only be interpretable in a sense where 'New York' is understood to mean some person or organization in New York, as when a businessman uses it to mean 'our New York office' or someone says New York received a grant from the federal government. This tendency is not iron-clad; it is sometimes possible to say something like My house received a package yesterday, in which the status of the subject as a Person is marginal, but in general it is Person endpoints which are realized as subjects.

With all this in mind, we can represent 'send' conceptually in the following way:

[CAUSE ([Person_x], Spatial[GO ([y], [Path FROM ([Person_x) TO ([Person_z])])])])]

And, following our earlier practice, 'receive' in the Spatial sense could be given the following representation, lacking only the causative predicate:

Spatial[GO ([y], [Path FROM ([Person_x) TO ([Person_z])])]

In fact, essentially the same representations could also be used for 'throw'/'catch', as well as for any similar verbs in this group, with the differences in meaning showing up elsewhere in cognition. The above representation is appropriate only when both endpoints are Persons; the representation of Bill threw the ball into the ravine would be roughly:

[CAUSE ([BILL], Spatial[GO ([BALL], FROM ([Person_{BILL})
Path TO ([Place_{IN} ([Thing_{RAVINE}])]))])])]

The argument of TO here is a Place rather than a Person, and it cannot

be realized as 'S' in the semology; we cannot say ?In the ravine caught the ball from Bill or ?The ravine caught the ball from Bill. These observations suggest a slight revision of our subject selection principle: only a Path endpoint which is a Person may be realized semologically as 'S'. When both endpoints of the same Path can be realized as 'S', and the rest of the representations are the same except possibly for the presence of an initiator, a doublet (or a pseudo-doublet, according to the semantic field involved) occurs.

5.2.3 "Bring"-type

Another of Green's classes includes such verbs as 'take', 'bring', 'drag', and 'push', in which the subject accompanies the transferee to the goal. These are similar to verbs of the 'throw'-class in that they involve the Spatial field: the transferee necessarily moves in physical space, and it is possible to have a directional prepositional phrase instead of an indirect object (I took the hippopotamus into the elevator, Bill dragged the unconscious prime minister out of the discotheque). However, this group of verbs is somewhat troublesome in terms of semantic analysis. At least some of these verbs appear to form pseudo-doublets with the ubiquitous 'receive':

25) a. John brought a dozen long-stemmed roses to Mary.

b. Mary received a dozen long-stemmed roses from John.

This can only be a pseudo-doublet rather than a true doublet in that (25a) does not necessarily imply (25b); Mary could refuse to accept the roses, for example. Note that, as with the 'throw' type, such a pseudo-doublet is only possible with a Person as indirect object:

26) a. John brought an ostrich to Mary's apartment.

b. ?Mary's apartment received an ostrich from John.

In general, this group is similar to the 'throw' class, the main difference being that here the source accompanies the transferee to the goal. In terms of conceptual representation, we might have something like the following for 'bring', where [x&y] means that x and y traverse the Path together:

[CAUSE ([Person^x], Spatial[GO ([Person^x & Thing^y], [Path TO ([Person^z])])])])]

The corresponding sense of 'receive' would lack the CAUSE predicate, as with the other 'receive'-type verbs we have seen:

Spatial[GO ([Person^x & Thing^y], [Path TO ([Person^z])])])]

However, it is not at all clear that there is a separate sense of 'receive' with such a conceptual representation; it is difficult to interpret Mary received a dozen long-stemmed roses from John so that it uniquely refers to the same situation described in John brought a dozen long-stemmed roses to Mary. If so, then it is doubtful whether 'bring' and 'receive' should be considered a pseudo-doublet.

Another way of looking at the situation is to interpret the sentence with 'bring' as referring to two separate but related events: John and the roses physically moving to where Mary is located (an event in the Spatial field), and John giving the roses to Mary (an event in the Inherent Possessional field). Thus 'bring' in the above sentence would have a representation like the following:

[CAUSE ([JOHN], Spatial[GO ([JOHN & ROSES], [TO ([MARY])])])]
InhPoss[GO ([ROSES], [FROM ([JOHN]) TO ([MARY])])])]

The 'receive' sentence, however, would just refer to the second part of the action, as follows:

InhPoss[GO ([ROSES], [FROM ([JOHN]) TO ([MARY])])]

This analysis, with an implied 'give' in the meaning of 'bring', is intuitively more satisfying than our first one, and it will be taken here to be the correct one. 'Bring' and 'receive' thus do not form a doublet as we have defined it, since the main action is not the same in both cases. This is consistent with the observation that Mary received a dozen long-stemmed roses from John cannot refer uniquely to the same situation described in John brought a dozen long-stemmed rose to Mary.

5.2.4 Abstract transferee: "Teach"-type

All of our examples so far have dealt with concrete transferees; that is, the thing being sold or sent or brought has been a conceptual Thing. There are, however, many instances of three-place verbs involving abstract transferees. In some cases these do not behave exactly like verbs with concrete transferees; later on we will see some instances where something other than a Person is the initiator of a Path and can thus appear as a subject in a doublet, and there are some fuzzy cases which are difficult to analyze.

One of the groups of verbs recognized by Green involves some type of information as transferee. Consider the verbs in the following sentences:

- 27) a. John taught Spanish to Millie.
- b. Millie learned Spanish from John.

28) a. Pete told me a joke about phoneticians.

b. I heard a joke about phoneticians from Pete.

29) a. Al read the children a bedtime story.

b. The children heard/listened to a bedtime story from Al.

If we apply the negation test, the results are not very clear and vary with different verbs:

30) John taught Spanish to Millie, but she didn't learn it.

31) Pete told me a joke about phoneticians, but I didn't hear it.

32) Al read the children a bedtime story, but they didn't listen to/?hear it.

Green (1974) argues at length that (in the terminology being used here) 'teach' and 'learn' form a true doublet only when 'teach' has an internal indirect object; in other words, she claims that of the sentences below, **a** entails **c** but **b** does not:

33) a. John taught Millie Spanish.

b. John taught Spanish to Millie.

c. Millie learned Spanish from John.

My own intuition is that 'teach' is unclear as to whether it implies a sentence such as **c**, but not along the strict lines suggested by Green; for me, both **a** and **b** above can mean either that Millie learned something or that she didn't. This is a somewhat subjective judgement, but the point can be made clearer by adding an adverbial phrase:

34) a. John taught Millie Spanish for a year, but she didn't learn anything.

b. John taught Spanish to Millie for a year, but she didn't learn anything.

Other verbs of this type are also unclear; both Green (1974) and Miller and Johnson-Laird (1976) confidently make many acceptability judgements which seem questionable at best. Actually, the question of whether or not these are true doublets or pseudo-doublets is not a very pressing issue; it seems safe to say that the above pairs can at least be considered pseudo-doublets.

What kind of conceptual representation might these verbs have? First of all, they are syntactically analogous to the other verbs we have been considering, and intuitively, some kind of information seems to be "going" from one person to another. Based on these facts and the Grammatical Constraint, we could postulate a basic structure similar to that for 'give'/'receive':

[CAUSE ([x], [GO ([y], [_{Path}FROM ([x]) TO ([z])])])]

This analysis is further supported by the fact that many of the verbs of physical location and possession which we have already discussed can also be used with an information transferee, as in the following examples from Green (1974:121):

35) This theory came from a sixteenth-century text.

36) I took these figures from the Merck manual.

37) I got this joke from Morris.

The problem is in determining what semantic field we are dealing with, as well as what conceptual categories the variables belong to. First of all, notice that when Bill, for instance, tells me a joke, he does not cease to "have" the joke; after he tells it, we both know it. This suggests that the transferee in such a sentence should belong to a different conceptual category from the transferee of 'sell'; we can call

this Information, as opposed to Person or Thing. Also, note that when we have a doublet such as those in sentences (35)-(37), both endpoints of the Path tend to be Persons. This is hardly surprising in the case of the goal endpoint, since only an animate, sentient being is capable of having thoughts and being aware of information. As for the source endpoint, there are (as we will see later) some apparent instances of non-Persons in this role, but only in cases where the action is not a volitional one.

It is difficult to say what semantic field these verbs should belong to; since the transferee is an abstraction, there is little basis for comparison with the other three-place verbs we have seen. It does not seem very plausible that they should belong in the Spatial field, since an abstraction is incapable of physical movement. Some kind of possession is perhaps more plausible, but both inherent and accidental possession seem strange when applied to an information transferee; if John tells me a joke, I don't own that joke, nor do I have any obligation to "give it back" to John. Perhaps the best solution is to postulate a different semantic field and call it Cognitive Possession, although no particular significance should be read into this choice of terms; Green (1974:121) apparently takes such a course of action when she decomposes these verbs into something like "Subject CAUSE i.o. to HAVE_{cog} d.o. BY CAUSE-ing d.o. to GO TO i.o. BY VERB-ing d.o.". Cognitive Possession involves Information as transferee, and an indefinite number of people can cognitively possess the same Information simultaneously.

Based on all this, a conceptual representation of x tells y to z and z

hears y from x respectively would be as follows:

[CAUSE ([Person^x], Cogposs[GO ([Info^y], [FROM ([Person^x]) TO ([Person^z])])])])]

Cogposs[GO ([Info^y], [FROM ([Person^x]) TO ([Person^z])])]

These are exactly parallel to the representations for 'give' and 'receive' except that the internal event is in the Cognitive Possessional rather than the Inherent Possessional field, and the transferee y is Information rather than a Thing. This Information may be expressed as a sentential complement rather than a noun, as in John told me that pigs have wings. Our subject selection principle still holds here, since these verbs are essentially like 'give' except that the transferee is abstract rather than concrete. However, as we will see below, an abstract transferee allows various situations which cannot occur when the transferee is a physical object.

5.2.5 Other abstract transferees

'Give' can be used with Information as transferee, in an apparent instance of the 'tell' type of verbs:

38) a. John gave me the answer to my problem.

b. I got/received the answer to my problem from John.

However, it is also possible to have a Thing or an Event as the subject of 'give' in such a case, and the same is true for a few other 'tell' verbs such as 'teach':

39) a. The falling rain gave me the answer to my problem.

b. I got/?received the answer to my problem from the falling rain.

40) a. Being on trial taught Ollie a valuable lesson.

b. Ollie learned a valuable lesson from being on trial.

There is a difference between (38) and (39)-(40), however. Sentence (38a) could mean that John unintentionally caused me to think of an answer (for instance, if my watching or thinking about John suddenly inspired me to come up with a solution), but it is more likely to refer to a situation where John acted volitionally, knowing the answer and then willingly imparting that information to me. In other words, John causes the action in both readings, but only in the second one is this causation volitional. Sentence (39a), though, can only have the first reading; rain obviously cannot do anything volitional, since it is inanimate. Similarly, (40) refers to a situation where the experience of being on trial caused Ollie to learn a valuable lesson, but this causation cannot be intentional, since the subject is an Event.

These differences suggest some revisions in the conceptual representations we have been using; in particular, some indication of volition is needed. Many authors (e.g. Miller and Johnson-Laird 1976, Talmy 1976, and Gruber 1976, to name just a few) have tackled the question of intentional vs. unintentional actions in a variety of ways. Jackendoff (1987a) postulates a separate "action tier" (in addition to a "thematic tier" such as we have already seen), based on similar suggestions in Culicover and Wilkins (1986) and Talmy (1985). This specifies (where appropriate) the Actor and Patient of a situation, as well as whether or not the action is volitional. In Jackendoff's terminology, an Actor need not be animate, as long as it is the focus of some action; for instance, the ball would be the Actor in The ball rolled

down the hill, and the action tier of this sentence would look like this:

[ACT ([BALL])]

If an action is volitional (obviously possible only with an animate Actor), this is indicated in the action tier; thus the sentence Bill ate an apple would have an action tier something like the following:

[ACT ([BILL], [APPLE])]
VOL

Furthermore, some sentences will lack an Actor and thus have an empty action tier, as in Bill received a letter yesterday.

The exact notation for indicating volition will not be a major concern here; Jackendoff's thematic tier is as reasonable a suggestion as any. The important thing is that all the causative three-place verbs we saw earlier (e.g. 'give', 'sell', 'bring', etc.) involved volitional actions. On the other hand, sentences (39a) and (40a) are clearly not volitional, since the subjects are inanimate, yet they apparently are causative. These facts can be captured by having the conceptual representations of both types of sentences involve a CAUSE predicate, with the difference that the action involved is specified as a volitional one in the case of, for example, John gave me a present for my birthday, and a nonvolitional one in the case of The falling rain gave me the answer to my problem.

There is another question to be confronted, though. In a sentence such as The falling rain gave Stan the answer, it does not seem right at first glance to consider the falling rain a "source" in the sense we have been using, i.e. something at which the answer originates before being transferred to Stan; rather, it is more like a stimulus which causes

Stan to "have" the answer indirectly. (There is, however, some independent evidence for considering Stan a goal in such cases, e.g. The answer came to Stan in a flash.) On the other hand, treating such a noun phrase (or gerundive verb phrase, such as being on trial) as anything other than a source leads to potential problems.

For example, the sentences The falling rain gave Stan the answer and Stan got the answer from the falling rain would seem to illustrate a doublet, at least when the second is interpreted in a non-agentive sense. One possible conceptual representation for the first sentence would involve the falling rain only as the initiator and not as source, as in the following:

[CAUSE ([FALLING RAIN], [GO ([ANSWER], [TO ([STAN])])])]

This creates a problem for the 'get' sentence, since we must either introduce a CAUSE predicate into its conceptual representation and distort our principle that initiators are always the unmarked subject, or find somewhere else in the representation to put the rain. However, if we follow the pattern used with concrete uses of 'give' and 'receive', the conceptual representations of these two sentences would be the same except for a CAUSE predicate in the first one, as shown below:

[CAUSE ([FALLING RAIN], [GO ([ANSWER], [FROM ([FALLING RAIN]) TO ([STAN])])])]

[GO ([ANSWER], [FROM ([FALLING RAIN]) TO ([STAN])])]

Here the falling rain is treated as a source, in order to account for its presence in an oblique phrase in Stan got the answer from the falling rain. It might be possible to consider the rain something else conceptually (perhaps an instrument?), but there is no clear reason to

do so. In fact, the Grammatical Constraint says that arbitrary generalizations involving syntax (such as the parallel structures in the concrete and abstract uses of 'give' and 'receive') should be reflected in semantic structure unless there is a good reason to do otherwise, and here there appears to be no such good reason. The idea of the rain as a source is not so implausible if we expand the notion of conceptual "source" beyond its most literal interpretation. A source can be not only a location from which "motion" proceeds, but anything serving as the origin of the transferee in a broad sense; this would include non-agentive initiators such as the falling rain above.

There is another group of expressions involving abstract 'give' which seem to parallel those in (39)-(40). Consider the following sentences:

- 41) a. John's criticism gave Mary an inferiority complex.
 b. Mary got/?received an inferiority complex from John's criticism.
- 42) a. Pablo gave the old house a fresh coat of paint.
 b. The old house got/received a fresh coat of paint from Pablo.
- 43) a. Bill gave Leopold a black eye.
 b. Leopold got/?received a black eye from Bill.
- 44) a. A truck gave my car a dent in its fender.
 b. My car got/received a dent in its fender from a truck.

Here, as in (39)-(40), it does not make much sense to speak of the subject of 'give' as the literal source of the transferee, but it can be considered the source in a more general, abstract way. Note also that it is not necessary for any of the participants to be Persons, although they can be. What seems to be common to all the above sentences is

that the subject of 'give' causes the indirect object to have some property, either physical or psychological: an inferiority complex, a fresh coat of paint, a black eye, a dent. This looks like a candidate for another semantic field, which we can call the Property Possessional field. The "locations" in this field are Things or Persons, and possibly also Events (cf. The mayor's speech gave the dedication ceremony an air of dignity), and the transferee is a Property. This Property is often a physical one which is defined by its effect on its "host"; a dent, for instance, must be a dent in something.

Conceptual representations for the pairs in (41)-(44) might be something like this:

[CAUSE ([x], PropPoss[GO ([PropY], [PathFROM ([x]) TO ([z])]])])]

PropPoss[GO ([PropY], [PathFROM ([x]) TO ([z])])]

where x and z can be Things, Persons, or Events. This representation is parallel to what we just saw for certain cases involving Cognitive Possession, except that z--the goal of the Path--does not have to be a Person. Intuitively, this is due to the fact that the "possession" of Properties is not limited to Persons, as we saw above (cf. The car has a dent in its fender as well as Mary has an inferiority complex), while Cognitive Possession obviously is (cf. ?My car knows that story vs. Mary knows that story).

It appears that we will have to revise our principle so that a Path endpoint which can be realized as 'S' does not always have to be a Person, but can belong to other categories according to the nature of the transferee and the semantic field involved. For example, in the fields where the transferee must be a Thing (Inherent and Accidental

Possessional and Spatial), an endpoint must be a Person to be realizable as unmarked subject; this is presumably because only a volitional being (i.e. a Person) is capable of possessing and controlling a physical object. The Spatial field, unlike the other two, can involve "locations" other than Persons, but only with Persons as locations is there a sense of possession; in fact, what Miller and Johnson-Laird (1976) call the Physical Possession field is really just the part of the Spatial field which involves Persons as locations.

As for the other fields, the abstract nature of the transferee allows more latitude in the nature of the endpoints. In the Cognitive Possessional field, the goal must be a sentient being (a Person), since the transferee is Information which must by its nature exist in someone's mind. However, as we have seen, the source can be anything (a Person, Place, or Event) if we allow a broad but plausible interpretation of "source". Similarly, in the Property Possessional field either endpoint can be a Person, Thing, or Event; the transferee is a Property, which is not limited in its possible locations the way Information is.

5.2.6 Non-doublet-forming three-place verbs

Now let us look at some three-place verbs which appear to form neither true doublets nor pseudo-doublets. Consider the following sentences:

- 45) a. Neville promised Adolf the Sudetenland.
 b. Adolf () the Sudetenland from Neville.

48) a. Ted refused Alvin the opportunity to speak.

b. Alvin () the opportunity to speak from Ted.

Here there appears to be another Potential Event which does not occur because it is specifically negated. Something like the following might be a conceptual representation for sentence (47a):

[CAUSE ([BOSS], [_{Event} NOT ([_{Potential Event} GO ([PROMOTION],
[_{Path} FROM ([BOSS]) TO ([SAM])])])])]

The idea here is that a Potential Event in these examples is not something which is being asserted, but something about which an assertion is being made. For example, in (45)-(46) it is being asserted that the subject is obligated to bring about the Potential Event, and in (47)-(48) it is being asserted that the subject prevented the Potential Event from occurring. It appears that as far as our subject selection principle is concerned, a Path occurring as part of a Potential Event does not count, and subjects of doublets can only come from a Path which is part of an actually occurring event. Better formalisms could undoubtedly be developed for stating this generalization, but the above statements are adequate for our purposes here.

There are a few other three-place verbs which seem not to form part of doublets, in at least some of their senses, because no conceptual Path is involved. One example is 'show'. When the direct object of 'show' is abstract Information, it has a meaning similar to 'teach' and might be reasonably paired with 'learn', or possibly 'find out' in a non-agentive sense:

49) a. Maggie showed Ron the value of friendship.

b. Ron learned the value of friendship from Maggie.

50) a. Jerry showed me how to drive a stick shift.

b. I found out how to drive a stick shift from Jerry.

In such cases it seems possible to postulate a conceptual representation like that for 'teach', in which an Information transferee "moves" between two Persons. In some instances, though, the direct object is a Thing, and in such cases no doublet appears possible:

51) a. Marilyn showed Dan a snarling ocelot.

b. Dan () a snarling ocelot from Marilyn.

'Learn' and 'find out' certainly do not work here, and no other verbs fit the blank very well. This is because this sense of 'show' can be roughly paraphrased as "cause to see" or possibly "allow to see"; a conceptual representation of (51a) in bracket notation might be as follows:

[CAUSE ([MARILYN], [_{Event}SEE ([DAN], [SNARLING OCELOT]))]

This representation contains no Path, because nothing is "moving". The ocelot is certainly not physically moving, and it would be difficult to argue that information about the ocelot is going from Marilyn to Dan; Marilyn is simply creating a situation where Dan can perceive the ocelot of his own accord. As Green (1974) also points out, an external indirect object generally seems odd with an information transferee, but is much more natural with a concrete transferee:

52) a. ?Maggie showed the value of friendship to Ron.

b. Marilyn showed a snarling ocelot to Dan.

Thus there is some evidence for two conceptually different verbs 'show'; one of these contains a conceptual Path and forms plausible doublets, while the other appears not to involve a Path and does not enter into any reasonable doublets.

5.2.7 Other uses of 'give'

Finally, there are some uses of 'give' which do not fit comfortably into any of the above categories and vary in their ability to form doublets with 'receive' and/or 'get'. One such usage involves communication of some sort (not always verbal) between two Persons. In many such cases doublets are possible, although some such sentences are better than others:

- 53) a. Mario gave Luigi a lot of flak.
b. Luigi got/received a lot of flak from Mario.
- 54) a. Barbara gave George a dirty look.
b. George got/received a dirty look from Barbara.
- 55) a. The driver in the next lane gave Mario the finger.
b. ?Mario got the finger from the driver in the next lane.
- 56) a. The teacher gave Gustav a hard time.
b. ??Gustav got/received a hard time from the teacher.

In general, these uses of 'give' seem similar to the 'tell' type of verb; there is Information being communicated here, although it is of a rather special kind. A conceptual representation for (53a) would thus be like the following:

[CAUSE ([MARIO], [GO ([A LOT OF FLAK],
[FROM ([MARIO]) TO ([LUIGI])])])]

On the other hand, some cases, such as those in (55)-(56), have characteristics of idioms -- they are difficult to use in constructions other than their normal one. For example, not only is it strange to express sentence (55a) with 'get', it is also strange to express it with passive (?The finger was given to Mario), cleft (?It was the finger that

Bill gave to Mario) and pseudo-cleft constructions (?What Bill gave Mario was the finger), except perhaps for humorous effect. This suggests that "give (someone) the finger" is an indivisible unit. It is not easy to draw a line between idioms and non-idioms, though. Expressions can be idiomatic to varying degrees; some expressions generally thought of as idioms can occur in a variety of guises (My leg is being pulled), and judgements of the acceptability of distorted idioms are very slippery and subject to context. This is not the place for an extended discussion of idioms (Makkai 1972 is one such study), so we can leave the discussion of sentences (53)-(56) with the tentative conclusion that (53)-(54) are conceptually like 'tell', while (55)-(56) are basically idiomatic.

Another type of odd 'give' expression involves what might be called a "reified action". These fall into two types, the first of which is illustrated below:

- 57) a. Wade gave Margo a bath.
 b. Margo ?got/??received a bath from Wade.
- 58) a. Sylvester gave the baby a kiss.
 b. The baby got/received a kiss from Sylvester.
- 59) a. Dave gave the manuscript a careful proofreading.
 b. The manuscript got/received a careful proofreading from Dave.
- 60) a. The goblins gave Mikhail a terrible fright.
 b. Mikhail got/received a terrible fright from the goblins.
- 61) a. Ralph gave Ed a punch in the nose.
 b. Ed got/received a punch in the nose from Ralph.

Some of the 'get'/'receive' sentences are more natural than others, but most of them seem to form reasonably good doublets. The second type of reified action is illustrated in the following sentences:

- 62) a. Gary gave Sol a ride in a Maserati.
 b. Sol got/?received a ride in a Maserati from Gary.
- 63) a. Mary gave Ernie a look at a real snarling ocelot.
 b. Ernie got/?received a look at a real snarling ocelot from Mary.

The sentences with 'receive' are perhaps less natural than the ones with 'get', but overall the (b) sentences are certainly conceivable.

Green (1974) points out that the above sentences with 'give' can generally be paraphrased using other verbs. For (57)-(61) we have the following:

- 64) a. Wade bathed Margo.
 b. Sylvester kissed the baby.
 c. Dave carefully proofread the manuscript.
 d. The goblins terribly frightened Mikhail.
 e. Ralph punched Ed in the nose.

Actually, there is a difference: the sentences in (64) can have either a singular or an iterative meaning, while the sentences with 'give' can only have the singular, one-time reading. This can be seen by adding an appropriate adverbial phrase to each of a pair of sentences, i.e. Ralph punched Ed in the nose for two hours vs. ?Ralph gave Ed a punch in the nose for two hours. (It is possible, though, to make the direct object of a 'give' sentence plural and make it iterative, e.g. Ralph gave Ed punches in the nose for two hours). Other than this aspectual difference, each sentence with 'give' means essentially the same as the corresponding

sentence without 'give', yet taken as a group, the verbs in (64) seem to have little in common except the fact that they are transitive.

For the sentences in (62)-(63), there is a rough paraphrase with 'let' and a subordinate verb phrase:

65) a. Gary let Sol ride in a Maserati.

b. Mary let Ernie look at a real snarling ocelot.

Again, the correspondence is not exact, since the sentences with 'give' imply more of a one-time event than do the sentences with 'let', but the idea is essentially the same.

One way of analyzing the above facts would be to consider the sentences in (57)-(63) to be merely alternate realizations of the same ideas expressed in (64)-(65), with an added provision that the action is a single event when the direct object ('kiss', 'punch in the nose') is singular. If so, then the sentences with 'give' would have essentially the same conceptual representation as the corresponding sentences with other verbs, perhaps with some kind of aspectual specification added (there is no room here to speculate in detail on what such specification might look like, but Kathman ms and Jackendoff 1987a:398-402 explore some possibilities). For Sylvester gave the baby a kiss and Sylvester kissed the baby, this basic representation might be something like this:

[_{Event}KISS ([SYLVESTER], [BABY])]

Similarly, both Gary gave Sol a ride in a Maserati and Gary let Sol ride in a Maserati would be something like the following:

[_{Event}LET ([GARY], [_{Event}SOL RIDE IN A MASERATI])]

The alternate realization with 'give' would then be possible only with

the appropriate aspectual specification.

What about the 'get'/'receive' sentences, though? The above analysis does not seem able to account for them. One possible explanation is analogy; since 'give' is so often paired with 'receive', speakers might tend to make a parallel idiom with the latter. However, if this is so, why do idioms such as "give the finger" or verbs such as 'refuse' and 'show' not allow a parallel expression? Our subject selection principle is in danger of becoming vacuous if we allow such apparently arbitrary exceptions, although some way might be found around the trouble.

Another alternative, though, is to consider the conceptual structure of the sentences in question to be like the others we have seen, with a source, goal, and transferee. Thus, Sylvester gave the baby a kiss would be as follows:

[CAUSE ([SYLVESTER], [GO ([KISS], [FROM ([SYLVESTER])
TO ([BABY])])])])]

The transferee in this case (KISS) could be thought of as an Event which the source causes the goal to experience, and which, since it must be singular and discrete as outlined above, can be treated like a Thing for conceptual purposes. As we have seen already, it is not necessary for transferees to be concrete, and some evidence for this analysis is provided by the possibility of using these expressions in some marked constructions (e.g. What Ralph gave Ed was a punch in the nose, though other constructions are not so good). Such examples would probably have to involve a different semantic field from what we have already seen, perhaps called the Discrete Action field.

The disadvantage of the above analysis is that it disregards the

advantage of the other one, namely the postulation of (at least partially) identical conceptual representations for sentences which apparently describe the same thing. Even so, it might be possible to indicate the similarity by specifying the Event-transferee in some way, perhaps by means of indices:

[CAUSE ([SYLVESTER], [GO ([I KISS j]), [FROM ([SYLVESTER,j)
TO ([BABY,j])]])])]

This approach opens up a Pandora's box of questions, though, so the matter will not be pursued further here.

Each of these proposed analyses has its good and bad points and a certain amount of evidence in its favor; even so, the second one is perhaps slightly more attractive. Accordingly, we can tentatively take it to be correct, while recognizing that the analysis with identical representations has its advantages. Perhaps some other analysis is possible which combines the best of both worlds, but it will have to wait for further research. This group of doublets is the most troublesome we have seen, and it illustrates the difficulties inherent in any detailed exploration of conceptual structure.

6 Summary and Conclusions

It is evident that the analysis of three-place verbs and lexical doublets involving them is more complex than it might seem at first glance. Those who have bothered to analyze such doublets have tended to focus on situations involving transfer of possession of a concrete transferee (i.e. John gave me a warthog/I received a warthog from John, Noam sold Sydney a solid gold pencil holder/Sydney bought a solid gold

pencil holder from Noam), but, as we have seen, these are just the tip of the iceberg. The transferee can be abstract as well as concrete, and, perhaps more interestingly, several reasonably well-defined groups of three-place verbs do not enter into doublets at all.

The principles allowing lexical doublets may be summarized as follows: (1) When there is motion along a conceptual Path, and both endpoints of the same Path are capable of being realized semologically as the unmarked subject as specified below, then a lexical doublet results. (2) The initiator of the motion along the Path is automatically realized as 'S' if it is specified in conceptual structure, and the endpoints of the Path can also be realized as 'S', subject to different restrictions according to the semantic field involved. (3) Different semantic fields place different restrictions on the types of conceptual entities which can occur as initiator, transferee, and endpoints. (4) Furthermore, the conceptual motion involved must be real and not just potential, as we saw with examples like Neville promised Adolf the Sudetenland.

The above principles account for the great majority of cases, but there are still some areas which are ripe for further research. For example, there is still the question of why the various restrictions occur. This thesis has been concerned with determining when three-place doublets do and do not occur and offering some partial explanations along the way, but it remains to be seen whether still more general principles could be found which would explain, for example, why Path endpoints can be realized as unmarked subjects.

The Discrete Action expressions (Ed gave Bill a punch in the nose)

have already been mentioned as presenting problems; space limitations have prevented a more detailed study of them here, but it would certainly be interesting to explore their relation to the more conventional three-place doublets. Another potential area of inquiry is two-place doublets (such as 'like'/'please') and how they relate to the three-place doublets to which this study has been limited. Dowty (ms) contains some interesting proposals in this direction, but a complete exploration of two-place doublets is beyond the scope of the present thesis.

One of the goals of this thesis has been to systematically explore the various types of three-place lexical doublets which occur and to show that an independent system of conceptual structure can lead to generalizations about such doublets, and to the extent that it has done so, it has succeeded. Most of the details of realization between the semantic and semological levels have been omitted so that more attention could be paid to the general issues involved, although many of these details could doubtless be filled in with further research. Any research into semantics has a tendency to invite controversy; nevertheless, we must continue to forge ahead in the hope that something good will come out of such research. The present thesis has been one attempt to confront a semantic issue in a systematic way and contribute to our knowledge of it.

APPENDIX

Appendix: Diagrams of some conceptual traces

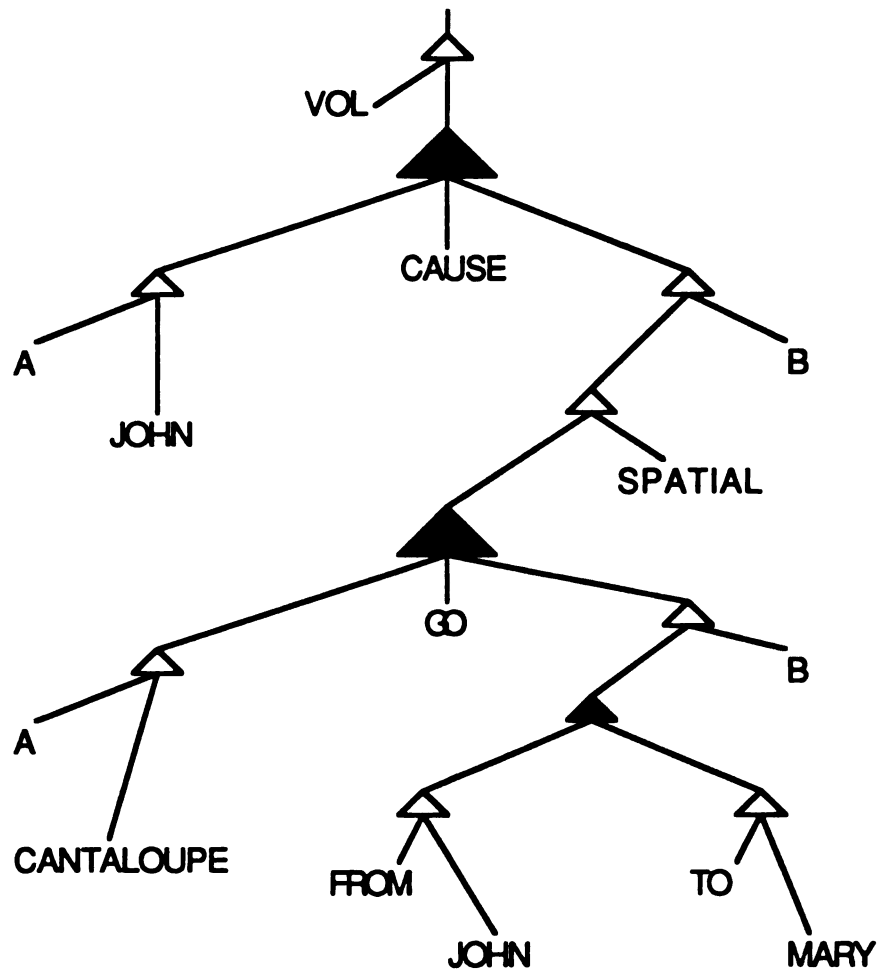


Figure A1. 'John threw Mary a cantaloupe'

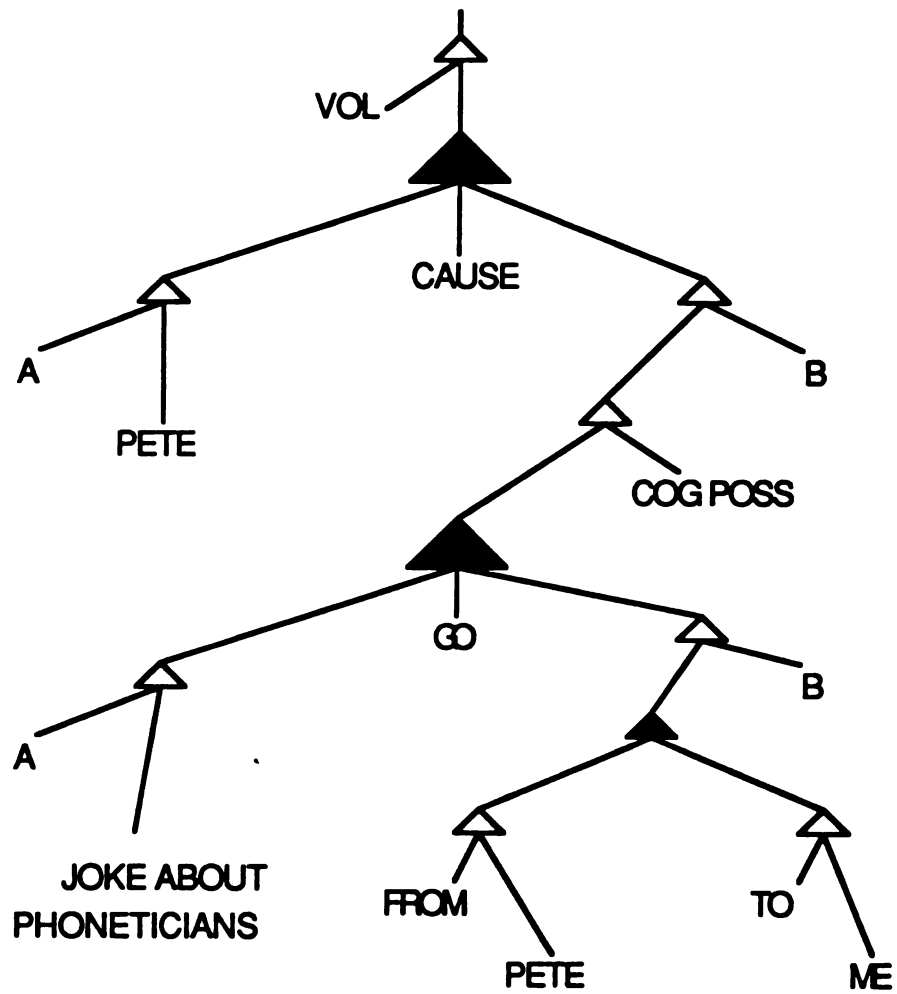


Figure A2. 'Pete told me a joke about phoneticians'

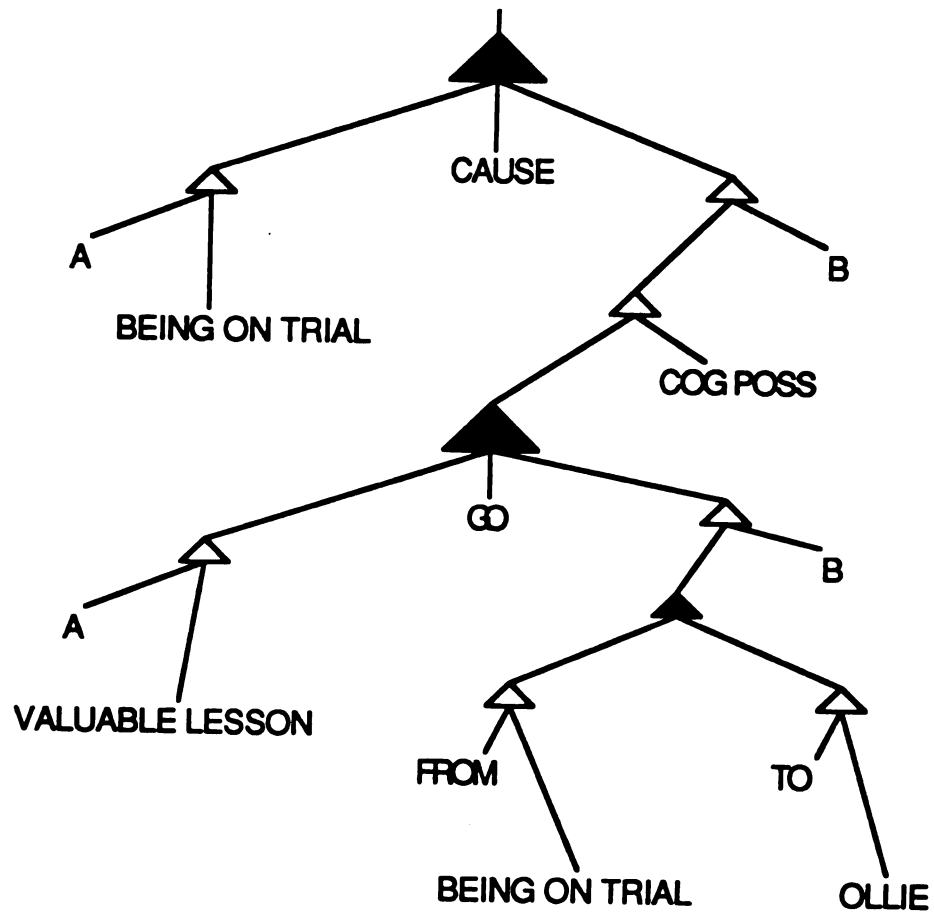


Figure A3. 'Being on trial taught Ollie a valuable lesson

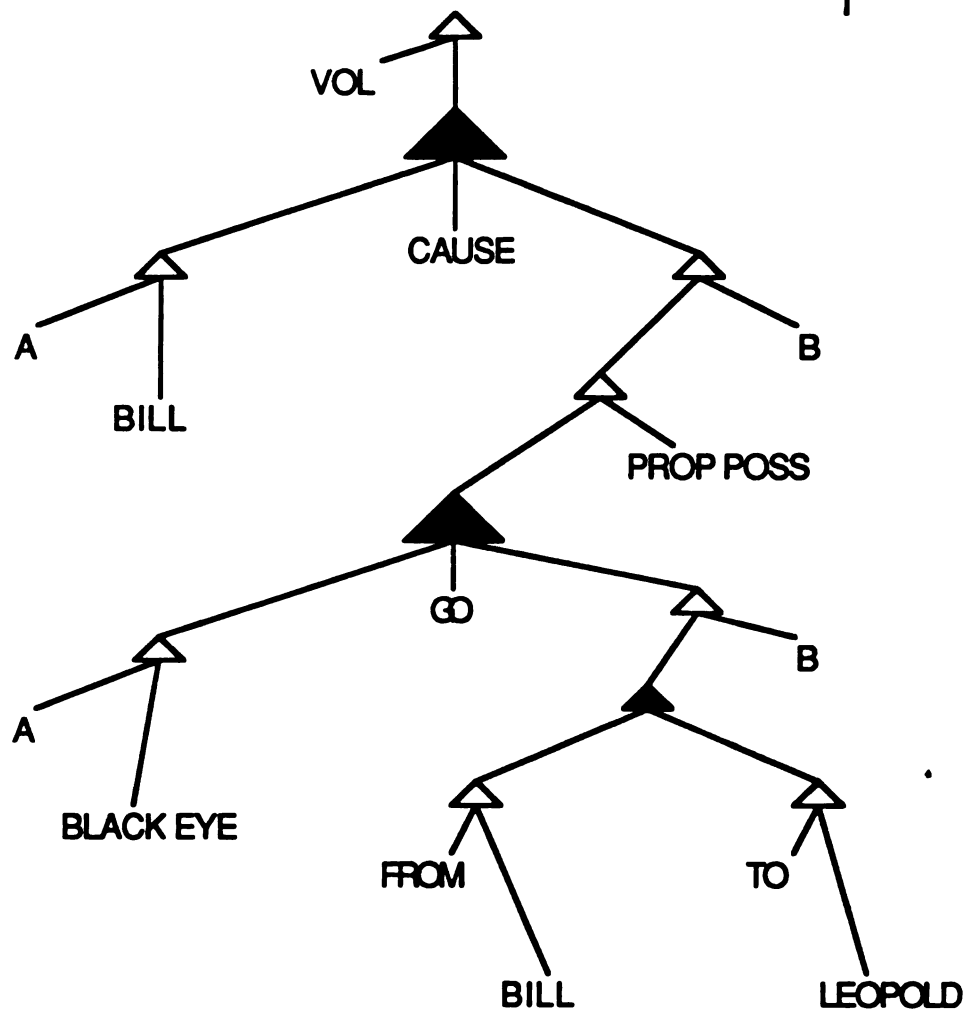


Figure A4. 'Bill gave Leopold a black eye'

BIBLIOGRAPHY

BIBLIOGRAPHY

- Anderson, John M. 1971. The Grammar of Case: Towards a Localistic Theory. Cambridge: Cambridge University Press.
- Bar-Hillel, Yehoshuah. 1967. 'Dictionaries and Meaning Rules.' Foundations of Language 3: 409-14.
- Barwise, J., and J. Perry. 1985. 'Shifting Situations and Shaken Attitudes.' Linguistics and Philosophy 8:105-61.
- Bolinger, Dwight. 1965. 'The Atomization of Meaning.' Language 41: 555-73.
- Carnap, Rudolf. 1956. Meaning and Necessity. Chicago: University of Chicago Press.
- Chomsky, Noam. 1965. Aspects of the Theory of Syntax. Cambridge, Mass.: MIT Press.
- Chomsky, Noam. 1981. Lectures on Government and Binding. Dordrecht: Foris.
- Christie, William. 1977. A Stratificational View of Linguistic Change. Edward Sapir Monograph Series in Language, Culture, and Cognition, 4. Lake Bluff, Ill.: Jupiter Press.
- Culicover, Peter, and Wendy Wilkins. 1986. 'Control, PRO, and the Projection Principle.' Language 62:120-153.
- Dik, Simon C. 1980. 'Basic Principles and Application of Functional Grammar.' in Moravcsik and Wirth, 45-75.
- Dowty, David. 1988. 'On the Semantic Content of the Notion 'Thematic Role'.' in G. Chierchia, B. Partee, and D. Turner, eds., Property Theory. Type Theory. and Natural Language Semantics. Dordrecht: Reidel.

- Dowty, David. ms. 'Thematic Proto-Roles, Subject Selection, and Lexical Semantic Defaults.' 1987 LSA Colloquium Paper.
- Fillmore, Charles. 1968. 'The Case for Case.' in Emmon Bach and Robert T. Harms, eds., Universals in Linguistic Theory. New York: Holt, Rinehart, and Winston, 1-88.
- Fillmore, Charles. 1977. 'Topics in Lexical Semantics.' in Roger W. Cole, ed., Current Issues in Linguistic Theory. Bloomington: Indiana University Press, 76-138.
- Fodor, Jerry. 1975. The Language of Thought. Cambridge: Harvard University Press.
- Fodor, Jerry, Merrill Garrett, E. Walker, and C. Parkes. 1980. 'Against Definitions.' Cognition 8:263-367.
- Green, Georgia. 1974. Semantics and Syntactic Regularity. Bloomington: Indiana University Press.
- Gruber, Jeffrey. 1976. Lexical Structures in Syntax and Semantics. Amsterdam: North-Holland.
- Halliday, M. A. K. 1985. An Introduction to Functional Grammar. London: Edward Arnold.
- Jackendoff, Ray. 1972. Semantic Interpretation in Generative Grammar. Cambridge: MIT Press.
- Jackendoff, Ray. 1983. Semantics and Cognition. Cambridge: MIT Press.
- Jackendoff, Ray. 1987a. 'The Status of Thematic Relations in Linguistic Theory.' Linguistic Inquiry 18.3: 369-411.
- Jackendoff, Ray. 1987b. Consciousness and the Computational Mind. Cambridge: MIT Press.

- Jackendoff, Ray. forthcoming. 'What is a Concept, that a Person May Grasp It?' to appear in Forum on 'What is a Concept?', Mind and Language .
- Jespersen, Otto. 1933(1964). Essentials of English Grammar. University, Alabama: University of Alabama Press.
- Kathman, David. ms. 'Aspectual Meaning in Russian.' Michigan State University.
- Katz, Jerrold. 1967. 'Recent Issues in Semantic Theory.' Foundations of Language 3: 124-194.
- Katz, Jerrold. 1972. Semantic Theory. New York: Harper & Row.
- Katz, Jerrold, and Jerry Fodor. 1963. 'The Structure of a Semantic Theory.' Language 39:170-210.
- Lakoff, George. 1987. Women, Fire, and Dangerous Things. Chicago: University of Chicago Press.
- Lakoff, George, and Mark Johnson. 1980. Metaphors We Live By. Chicago: The University of Chicago Press.
- Lamb, Sydney M. 1966. Outline of Stratificational Grammar. Washington, D.C.: Georgetown University Press.
- Lamb, Sydney M. 1983. 'On Determining the Number of Strata in Linguistic Structure.' in John Morreal, ed., The Ninth LACUS Forum. Columbia, S.C.: Hornbeam Press, 189-203.
- Langacker, Ronald. 1988. 'An Overview of Cognitive Grammar.' in Brygida Rudzka-Ostyn, ed., Topics in Cognitive Grammar. Amsterdam: John Benjamins, 3-48.
- Lewis, David. 1972. 'General Semantics.' in D. Davidson and G. Harman, eds., Semantics of Natural Language. Dordrecht: Reidel, 169-218.

Lockwood, David. 1972. Introduction to Stratificational Linguistics. New York: Harcourt Brace Jovanovich.

Lockwood, David. ms. Introduction to Stratificational Linguistics (Revised Edition).

Longacre, Robert. 1976. An Anatomy of Speech Notions. Lisse: The Peter de Ridder Press.

Lyons, John. 1963. Structural Semantics: An Analysis of Part of the Vocabulary of Plato. London: Oxford University Press.

Lyons, John. 1977. Semantics. Cambridge: Cambridge University Press.

Makkai, Adam. 1972. Idiom Structure in English. The Hague: Mouton.

Marr, David. 1982. Vision. San Francisco: Freeman.

McCawley, James. 1968. 'Lexical Insertion in a Transformational Grammar without Deep Structure.' in B. Darden, C.-J. N. Bailey, and A. Davison, eds., Papers from the Fourth Meeting of the Chicago Linguistic Society. Chicago: Department of Linguistics, University of Chicago, 71-80.

McCawley, James. 1980. 'An Un-Syntax.' in Moravcsik and Wirth, 167-93.

McCawley, James. 1988. The Syntactic Phenomena of English. Chicago: University of Chicago Press.

Miller, George A., and Philip Johnson-Laird. 1976. Language and Perception. Cambridge: Cambridge University Press.

Moravcsik, Edith A., and Jessica R. Wirth, eds. 1980. Current Approaches to Syntax (Syntax and Semantics, Vol. 13). New York: Academic Press.

- Pike, Kenneth, and Evelyn Pike. 1976. Grammatical Analysis. Dallas: The Summer Institute of Linguistics.
- Radford, Andrew. 1988. Transformational Grammar. Cambridge: Cambridge University Press.
- Rappaport, Malka, and Beth Levin. 1988. 'What to Do with Theta-Roles.' in Wendy Wilkins, ed., Thematic Relations (Syntax and Semantics, Vol. 21). San Diego: Academic Press, 7-36.
- Reich, Peter. 1969. 'The Finiteness of Natural Language.' Language 45: 831-43.
- Reich, Peter. 1970. 'The English Auxiliaries: A Relational Network Description.' Canadian Journal of Linguistics 16: 18-50.
- Rosch, Eleanor, Carolyn Mervis, W. Gray, D. Johnson, and P. Boyes-Braem. 1976. 'Basic Objects in Natural Categories.' Cognitive Psychology 8: 382-439.
- Sampson, Geoffrey. 1980. Schools of Linguistics. London: Hutchinson & Co.
- Schreyer, Rudiger. 1980. 'Nodes and Nets: Explorations in Relational Network Notation.' in James Copeland and Philip Davis, eds., Papers in Cognitive-Stratificational Linguistics. Houston: Rice University, 163-83.
- Staal, J. S. 1967. 'Some Semantic Relations Between Sentoids.' Foundations of Language 3: 66-88.
- Sullivan, William J. 1980. 'Syntax and Linguistic Semantics in Stratificational Theory.' in Moravcsik and Wirth, 301-27.
- Talmy, Leonard. 1976. 'Semantic Causative Types.' in Masayoshi Shibatani, ed., The Grammar of Causative Constructions (Syntax and Semantics, Vol. 6). New York: Academic Press, 43-116.

Van Valin, Robert D., and William A. Foley. 1980. 'Role and Reference Grammar.' in Moravcsik and Wirth, 329-52.

Warren, R. M. 1970. 'Perceptual Restoration of Missing Speech Sounds.' Science 167: 392-3.

MICHIGAN STATE UNIV. LIBRARIES



31293005675446