In (9.56a), the verb subcategorizes a full PP, which happens in these instances to be filled by an (optionally) intransitive preposition. In these examples, the preposition specifies the path all by itself. In (9.56b), the verb occurs idiomatically with an intransitive preposition (or "particle"), and the meaning of the verb-particle combination is specified in the lexicon. In neither case does the preposition have the syntactic or semantic role called for by a verb like "bread," a bare preposition expressing a bare path-function. Thus the Lexical Variable Principle appears to be valid, at least for this case, whichgiven the wide range of combinations of functions and arguments seen in (9.46) (9.52) that *can* lexicalizeis not a trivial one.

This argument has involved lexicalization of an event-function and parts of a path. Ross (1972) gives a similar argument with respect to embedded event-functions (interestingly, in a quite different theoretical framework). He observes that the semantic structure of "try to find" in (9.57a) can also be lexicalized as "look for," as in (9.57b); but there could not be a verb "trentertain" that lexicalizes the semantic structure of "try" and "entertainment" alone, as in (9.57c).

(9.57)   (Ross's (88))

   a. Fritz tried to find entertainment.

   b. Fritz looked for entertainment.

   c. *Fritz trentertained to find.

Though the pragmatics of Ross's hypothetical example may leave something to be desired, the verb "trentertain" is particularly implausible because the corresponding syntactic patterna verb that must be followed by an objectless transitive verbis unknown. Ross argues from this example that if a verb lexicalizes multiple predicates (event- or state-functions), they must be adjacently embedded in semantic structure. Formally, his claim amounts to a special case of the Lexical Variable Principle, since lexicalization of nonadjacent functions would lead to a variable that is a bare event- or state-function rather than a full conceptual constituent. Again, this is a case of nontrivial interest. 10

This is by no means all there is to say about lexicalization patterns. I have not mentioned, for instance, any of the fascinating material in Talmy's (1980) broad crosslinguistic survey. However, this much will serve for present purposes; it begins to provide some idea of how lexical and syntactic variety can be achieved within the expressive constraints imposed by a fairly rigid functional form in semantic structure.

Chapter 10
Nonspatial Semantic Fields and the Thematic Relations Hypothesis

The great insight of Gruber (1965), anticipated by others but never demonstrated in such detail (see references in Anderson (1971, 6), is that the semantics of motion and location provide the key to a wide range of further semantic fields.

In present terms, Gruber's hypothesis may be stated like this:

Thematic Relations Hypothesis (TRH)
In any semantic field of [EVENTS] and [STATES], the principal event-, state-, path-, and place-functions are a subset of those used for the analysis of spatial location and motion. Fields differ in only three possible ways:
a. what sorts of entities may appear as theme;
b. what sorts of entities may appear as reference objects;
c. what kind of relation assumes the role played by location in the field of spatial expressions.

Gruber develops this hypothesis by showing that similar grammatical and lexical patterns appear across apparently unrelated semantic fields; Jackendoff (1972, 1976) extends and formalizes Gruber's work. Here we will give only the flavor of this work and discuss its consequences, emphasizing improvements on the 1976 formulation.

The significance of this insight to the present undertaking cannot be overemphasized. It means that in exploring the organization of concepts that, unlike those of #physical space#, lack perceptual counterparts, we do not have to start *de novo*. Rather, we can constrain the possible hypotheses about such concepts by adapting, insofar as possible, the independently motivated algebra of spatial concepts to our new purposes. The psychological claim behind this methodology is that the mind does not manufacture abstract con-

cepts out of thin air, either. It adapts machinery that is already available, both in the development of the individual organism and in the evolutionary development of the species.

10.1
Temporal and Possessive Fields

Let us begin with a particularly transparent illustration of the Thematic Relations Hypothesis. It has often been noticed (as in Anderson (1971), Clark (1973)) that prepositions of time are on the whole identical to spatial expressions (10.1) and that temporal PPs are attached to sentences in the same way as PPs of location (10.2).

(10.1)

a. at 6:00 from
   Tuesday to Thursday
   in 1976 on my birthday

b. at the corner
   from Denver to Indianapolis
   in Cincinnati
   on the table

(10.2)

a. In 1976, Max met a cockroach.
   Jean ate breakfast at 8:00.

b. In Cincinnati, Max met a cockroach. (= (9.4))
   Jean ate breakfast in her bedroom.

This suggests that temporal expressions define a one-dimensional "pseudospace," the well-known time-line. It is not [THINGS] that are located in time, but [EVENTS] and [STATES]. Thus we may define the temporal field as follows, according to criteria (a c) of the Thematic Relations Hypothesis:

(10.3)

Temporal field:
a. [EVENTS] and [STATES] appear as theme.

b. [TIMES] appear as reference object.

c. Time of occurrence plays the role of location.

The TRH predicts a phenomenon not pointed out by Anderson or Clark: that verbs asserting temporal location will appear in patterns parallel to those of spatial verbs. Let us compare the temporal expressions in (10.4) to the spatial ones in (10.5).

(10.4)

a. The meeting is at 6:00. (BE)

b. We moved the meeting from Tuesday to Thursday. (GO)

c. Despite the weather, we kept the meeting at 6:00. (STAY)

(10.5)

a. The statue is in the park. (BE)

b. We moved the statue from the park to the zoo. (GO)

c. Despite the weather, we kept the statue on its pedestal. (STAY)

(10.4) shows that when the temporal location of an event is capable of being changed, the verbs used to express change or lack thereof are identical to verbs of spatial motion or lack thereof. Similarly, compare the temporal expressions in (10.6a) with the spatial expressions of extent in (10.6b).

(10.6)

a. Ron's speech went/extended/lasted from 2:00 to 4:00.

b. The road went/extended from Denver to Indianapolis.

Again, many of the same verbs occur.

To appreciate the force of the parallelism, consider the inference patterns of corresponding spatial and temporal expressions. The function GOExt, expressed in (10.6b), maps a [THING] and a [PATH] into a [STATE] and asserts that the [THING] occupies every point of the [PATH]. When shifted into the temporal domain, as in (10.6a), GOExt maps an [EVENT] and a temporal [PATH] into a [STATE] and asserts that the [EVENT] occupies all points in time within the temporal [PATH]. The verb "move" in (10.4b), while it loses the sense of continuous traversal, asserts that at the beginning of the event described, the meeting was on Tuesday, and at the end, on Thursdaya subset of the inference pattern expected of spatial GO. In other words, temporal expressions preserve much of the force of lexically parallel spatial expressions, relative to the definitions of theme and location in (10.3).

We will express this semantic parallelism formally by using subscripted spatial functions as conceptual structures for temporal functions. Thus, for example, (10.7a d) will be the representations for (10.4a c) and (10.6a).

(10.7)

a. $[_{State} BE_{Temp} ([_{Event} MEETING], [_{Place} AT_{Temp} ([_{Time} 6:00])])]$

b. $[_{Event} CAUSE ([_{Thing} WE], [_{Event} GO_{Temp} ([_{Event} MEETING],$
$\left[_{Path} \begin{array}{l} FROM_{Temp} ([_{Time} TUESDAY]) \\ TO_{Temp} ([_{Time} THURSDAY]) \end{array}\right])])]$

c. $[_{\text{Event}} \text{CAUSE} ([_{\text{Thing}} \text{WE}], [_{\text{Event}} \text{STAY}_{\text{Temp}}$
$([_{\text{Event}} \text{MEETING}], [_{\text{Place}} \text{AT}_{\text{Temp}} ([_{\text{Time}} 6{:}00])])])]$

d. $[_{\text{State}} \text{GO}_{\text{Ext,Temp}} ([_{\text{Event}} \text{SPEECH}],$
$\begin{bmatrix} \text{FROM}_{\text{Temp}} ([_{\text{Time}} 2{:}00]) \\ _{\text{Path}} \text{TO}_{\text{Temp}} ([_{\text{Time}} 4{:}00]) \end{bmatrix})]$

This is not the only way time can be conceptualized. As Clark (1973) observes, there is an alternative conceptualization in which times serve as theme instead of reference object. Compare (10.8a) and (10.8b).

(10.8)

a. Tuesday crept by.
   Christmas is fast approaching.
   Our future lies ahead of us.

b. The freight train crept by.
   The tiger is fast approaching.
   The frontier lies ahead of us.

Here temporal periods, or events considered as temporal periods, are conceived of as moving relative to an observer or experiencer who is conceived of as reference object. Interestingly, expressions in this field often seem to be more emotionally loaded than those defined by (10.3). This is perhaps because these expressions are more closely related to the experience of time than (10.3), which abstracts time away from experience so that one can view time periods synoptically and move events around within them. 1

Verbs of possession define an entirely different semantic fieldactually a family of semantic fields, since there are several distinct notions of possession. A well-known difference is that between inalienable possessionthe way one possesses one's nose, for instanceand alienable possessionthe way one possesses a book. Alienable possession in turn divides into (at least) ownership and temporary control, so that one can, for example, distinguish a lender's from a borrower's rights over an object. (See Miller and Johnson-Laird (1976, section 7.2.2) for discussion.) Moreover, the kinds of things one can do with a disease such as a coldhave one, get one, give yours to someone elsepattern much like expressions of possession, suggesting yet another member of this family of fields.

Whichever notion of possession we consider, we find that it plays the role that location does in the spatial field, as the central element of a group of [STATE] and [EVENT] concepts. As illustration, we

will treat alienable possession, ignoring its further subdivision. It satisfies the Thematic Relations Hypothesis in the terms stipulated in (10.9). Each of the other members of the family substitutes the appropriate notion of possession for "alienably possessed" in (10.9c).

(10.9)

Alienable possession:
a. [THINGS] appear as theme.

b. [THINGS] appear as reference object.

c. Being alienably possessed plays the role of location; that
   is, "y has/possesses x" is the conceptual parallel to spatial "x is at y."

The pseudospaces of all the possessive fields are discontinuous; there is no way to make sense of a continuous transition in possession from one individual to another. Thus [PATHS] degenerate essentially into their endpoints, and the function GO can be treated, in this special case, as a change-of-state function, if one desires.

The examples in (10.10) illustrate verbs in this field, displaying the full range of functional possibilities. (Subscripts that are obvious have been omitted; we use the subscript "Poss" to designate functions relativized to alienable possession.)

(10.10)

a. Beth has/possesses/owns the doll.
   The doll belongs to Beth.
   [State BEPoss([DOLL], [Place ATPoss([BETH])])]

b. Beth received the doll.
   [Event GOPoss([DOLL], [Path TOPoss([BETH])])]

c. Beth lost the doll.
   [Event GOPoss([DOLL], [Path FROMPoss([BETH])])]
   Amy gave the doll to Beth.
   [CAUSE ([AMY], [GO$_{Poss}$ ([DOLL],
   $$\left[\begin{matrix} \text{FROM}_{Poss} \text{ ([AMY])} \\ _{Path} \text{ TO}_{Poss} \text{ ([BETH])} \end{matrix} \right])])]$$

d.

e. Amy kept the doll.
   [CAUSE ([AMY], [STAYPoss([DOLL],
                     [Place ATPoss([AMY])])])]

f. Amy gave up/relinquished the doll.
   [LET ([AMY], [GOPoss([DOLL], [FROMPoss([AMY])])])]

g. Beth obtained the doll.
   [CAUSE ([BETH], [GOPoss([DOLL], [TOPoss([BETH])])])]

h. Beth accepted the doll.
   [LET ([BETH], [GOPoss([DOLL], [TOPoss([BETH])])])]

i. Amy sold the doll to Beth for $5.
   [CAUSE ([AMY],

$$
\begin{bmatrix}
GO_{Poss} ([DOLL], \begin{bmatrix} FROM_{Poss} ([AMY]) \\ TO_{Poss} ([BETH]) \end{bmatrix}) \\
GO_{Poss} ([\$5], \begin{bmatrix} FROM_{Poss} ([BETH]) \\ TO_{Poss} ([AMY]) \end{bmatrix})
\end{bmatrix})]
$$

j. Beth bought the doll from Amy for $5.
   [CAUSE ([BETH],

$$
\begin{bmatrix}
GO_{Poss} ([DOLL], \begin{bmatrix} FROM_{Poss} ([AMY]) \\ TO_{Poss} ([BETH]) \end{bmatrix}) \\
GO_{Poss} ([\$5], \begin{bmatrix} FROM_{Poss} ([BETH]) \\ TO_{Poss} ([AMY]) \end{bmatrix})
\end{bmatrix})]
$$

Only a few verbs are shared between the spatial and possessive fields; the most prominent are "keep," a STAY verb in both fields, and "belong," which expresses BE of possession and something like SHOULD BE of location (as in "The cookies belong in the jar"). On the other hand, the use of "from" and "to" to express possessive source- and goal-function is quite general; and other languages such as French and Hebrew use the verb "be" for possession ("Le livre est à Jean," "Hasefer haya. In addition, English has the possessive " The book is mine" and the spatial "The table has a book on it." Thus there is a certain amount of lexical justification for this analysis, though less for English than in the temporal field.

Causation plays a rich role in this field. "Receive" and "lose" express noncausative events, since the subject exercises no control. The contrasts between "give" and "relinquish" and between "obtain" and "accept" are prime examples of the distinction between CAUSE and LET. With transactional verbs such as "buy" and "sell," the subject is conceptualized as the initiator of the transfer of both the doll (primary theme) and the money (secondary theme). The activity of the other partner in the transaction is not described, though it may be inferred pragmatically (or perhaps there is further internal structure not represented heresee Miller and Johnson-Laird (1976, section 7.2.6)). Thus "buy" and "sell" describe similar transactions, and differ only with respect to which character is the initiator.

10.2
Identificational, Circumstantial, and Existential Fields

Another semantic field, called *identificational* by Gruber, concerns categorization and ascription of properties.

(10.11)

Identificational field:
a. [THINGS] appear as theme.

b. [THING TYPES] and [PROPERTIES] appear as reference objects.

c. Being an instance of a category or having a property plays the role of location.

This is the field in which we find the "be" of categorization that played such a prominent role in chapters 5 and 6. As observed there, NPs used as reference objects in this field appear grammatically as predicate nominals, and when indefinite are interpreted as [TYPES] rather than [TOKENS].

(10.12) gives examples of verbs in this field. (Again, subscripts are omitted where obvious.)

(10.12)

a. Elise is a pianist.
   [State BEIdent ([Thing Token ELISE],
                          [Place ATIdent ([Thing Type PIANIST])])]

b. Elise became/turned into a mother.
   [Event GOIdent ([Token ELISE],
                          [Path TOIdent ([Type MOTHER])])]

c. The coach changed from a handsome young man into a pumpkin.
   [Event GOIdent ([Token COACH],

$$\begin{bmatrix} \text{FROM}_{\text{Ident}} ([\text{MAN}]) \\ \text{Path} \ \text{TO}_{\text{Ident}} ([\text{PUMPKIN}]) \end{bmatrix})]$$

d. The coach stayed/remained a pumpkin.
   [Event STAYIdent ([Token COACH],
                          [Place ATIdent ([Type PUMPKIN])])]

e. Sol made Gary a celebrity.
   [CAUSE ([SOL], [GOIdent ([GARY],
                          [TOIdent ([CELEBRITY])])])]

f. Sol kept Gary a celebrity.
   [CAUSE ([SOL], [STAYIdent ([GARY],
                          [ATIdent ([CELEBRITY])])])]

g. Sol left Gary a celebrity.
   [LET ([SOL], [STAYIdent ([GARY],
                               [ATIdent ([CELEBRITY])])])]

The preposition "as" frequently appears as a marker of identificational location (i.e., categorization). (10.13) gives some representative constructions, most of which are too complex to be analyzed with the formalisms developed so far.

(10.13)

a. I used to work as a musician.

b. He imagined me as a celebrity.

c. He treated me as a celebrity.

d. He hired me as a janitor.

e. As a citizen of Lower Bassadonia, I protest vehemently.

All the verbs in (10.12) can appear with an adjective phrase in place of the predicate nominal. (10.14) gives a few cases.

(10.14)

a. The light is red.
   [BEIdent ([LIGHT], [ATIdent ([Property RED])])]

b. The light changed from red to green.
   $$[GO_{Ident} ([LIGHT], \begin{bmatrix} FROM_{Ident} ([Property\ RED]) \\ TO_{Ident} ([Property\ GREEN]) \end{bmatrix})]$$

c. Sol kept Gary famous.
   [CAUSE ([SOL], [STAYIdent ([GARY],
                               [ATIdent ([Property FAMOUS])])])]

There are also adjectival analogues to some of the "as NP" constructions in (10.13), for instance, "He considered me famous," "He imagined me famous." And many [PROPERTIES] lexicalize with a GOIdent function to form so-called inchoative verbs, a few of which appear in (10.15). 2

(10.15)

a. The pages yellowed.
   [GOIdent ([PAGES], [TOIdent ([Property YELLOW])])]

b. The metal melted.
   $$[GO_{Ident} ([METAL], \begin{bmatrix} FROM_{Ident} ([SOLID]) \\ TO_{Ident} ([LIQUID]) \end{bmatrix})]$$

c. The flames blackened the building.
   [CAUSE ([FLAMES], [GOIdent ([BUILDING],
                               [TOIdent ([BLACK])])])]

The identificational field, unlike the possessive field, shows signs of continuous [PATHS] as well as end-states. For instance, the verb "range" behaves like a GOExt function, specifying occupation of end-points and all (or many) points in between. Note that it appears in simple present and with source-and goal-functions, the sign of stative GOExt. Also, compare the identificational cases (10.16a,b) with the spatial use of "range" (10.16c).

(10.16)

a. Our clients range from psychiatrists to psychopaths.

$$[_{\text{State}} \text{GO}_{\text{Ext,Ident}} ([\text{OUR CLIENTS}], \begin{bmatrix} \text{FROM}_{\text{Ident}} ([\text{PSYCHIATRISTS}]) \\ \text{TO}_{\text{Ident}} ([\text{PSYCHOPATHS}]) \end{bmatrix})]$$

b. This theory ranges from the sublime to the ridiculous.

$$[_{\text{State}} \text{GO}_{\text{Ext,Ident}} ([\text{THEORY}], \begin{bmatrix} \text{FROM}_{\text{Ident}} ([\text{SUBLIME}]) \\ \text{TO}_{\text{Ident}} ([\text{RIDICULOUS}]) \end{bmatrix})]$$

c. Jackrabbits range from Maine to Florida.

$$[_{\text{State}} \text{GO}_{\text{Ext}} ([\text{JACKRABBITS}], \begin{bmatrix} \text{FROM} ([\text{MAINE}]) \\ \text{TO} ([\text{FLORIDA}]) \end{bmatrix})]$$

Next, compare the spatial expressions in (10.17) with the identificational ones in (10.18).

(10.17)

a. The train traveled to New York.

b. The train traveled toward New York.

(10.18)

a. The balloon became small.

b. The balloon became smaller.

In the (a) sentences, the theme achieves the goal: the train reaches New York, and the balloon ends up with the property "small." On the other hand, the (b) sentences describe the theme getting closer to the goal, without necessarily reaching it. In (10.18b), the balloon may still end up largebut it is closer to small than before. This similarity of inference patterns suggests that the comparative adjective expresses an identificational *direction,* a path whose endpoints are not specified. We therefore assign (10.18a,b) the respective representations (10.19a,b).

(10.19)

a. [GOIdent ([BALLOON], [Path TOIdent ([Property SMALL])])]

b. [GOIdent ([BALLOON],
              [Path TOWARDIdent ([Property SMALL])])]

There is evidence that this use of identificational TOWARD is correct. Recall well-formedness rule (9.16a), which permitted the construction of places from paths, as in "He lives two miles down the road from here." If the comparative adjective expresses a direction, this explains why it can appear in constructions with analogous modifiers. (For a discussion of the syntactic parallels, see Jackendoff (1977a, chapter 6).)

(10.20)

a. Sally is three inches shorter than Bill.

b. Sally is way bigger than Bill.

In these sentences, "Bill" serves as a reference object, the comparative adjective specifies a path away from Bill along a certain scale of value, and the quantifier and measure phrases specify distance along the path. The result is an identificational [PLACE], as required by the argument structure of "be." In other words, (10.20) is a complete semantic analogue of "He lives two miles down the road from here," despite its somewhat different grammatical structure. (10.20a) therefore receives (10.21) as its representation.

(10.21)

$$\left[_{\text{State}} \text{BE}_{\text{Ident}} \left([\text{SALLY}], \left[_{\text{Place}} \text{ON}_{\text{Ident}} \left(\left[_{\text{Path}} \begin{array}{l} \text{FROM } ([\text{BILL}]) \\ \text{TOWARD}_{\text{Ident}} ([\text{SHORT}]) \\ [_{\text{Amount}} \text{3 INCHES}] \end{array}\right]\right)\right]\right)\right]$$

Thus, the use of continuous identificational paths makes possible an analysis of the comparative that is in accord both with the expressive capacity of the construction and with the Thematic Relations Hypothesis. 3

In short, adjectives express absolute properties (within syncategorematicity, of coursea small elephant is still bigger than a big mouse), while comparative adjectives express properties relative to a stipulated reference standard. In this relative sense, they act like spatial directions and can therefore undergo similar modification.

We should take note of the precise extent of the parallelism. Although all comparative adjectives can be taken to express traversal of or position on a scale, not many admit measure expressions like "three inches." We find "three inches higher/lower/longer/shorter," "three minutes earlier/later/older/younger," "three degrees hotter/ colder," and a few others; but there is no unit of measurement for "big," "beautiful," "sophisticated," "wise," "tasty," "lucky," or thousands of others. Still, we do find the construction with a quantifier:

"far/much/a little bigger/wiser/tastier/luckier/more beautiful/more sophisticated," and this is sufficient for the spatial parallel. To distinguish those adjectives that allow a measure expression in the comparative from those that do not, we will need to invoke a feature [METRICIZABLE], which indicates the possibility of a replicable unit of distance throughout the scale. Nonmetricizable [PROPERTIES], which are in the great majority, will permit only a relative scale of distance. Spatial distance, of course, is metricizable, and is thus richer and more complex than the pseudospaces defined by most adjectives.

The next field is called *circumstantial.*

(10.22)

Circumstantial field:
a. [THINGS] appear as theme.

b. [EVENTS] and [STATES] appear as reference objects.

c. *"x* is a character of *y"* plays the role of spatial *"x* is at *y."*

Syntactically, circumstantial verbs always subcategorize a subordinate clause that expresses the reference [EVENT] or [STATE]. This subordinate clause lacks a subject, and the theme of the main clause is understood to serve in this rolethat is, to be the missing character in the reference [EVENT] or [STATE].

To make this less abstract, compare (10.23a,b) with (10.23c,d).

(10.23)

a. Fred kept composing quartets.

b. Louise kept Fred composing quartets.

c. Fred stayed in the attic.

d. Louise kept Fred in the attic.

In (10.23a,b), the subordinate clause "composing quartets" lacks an overt syntactic subject; "Fred" is understood as fulfilling this function. The lexical parallel with (10.23d) suggests an analysis in which "Louise" is agent, "Fred" is theme, and "composing quartets" serves as a kind of [PLACE]. (10.22) defines just what kind of [PLACE] it is: an [EVENT] in which Fred is a character. Then, just as spatial "keep" means "maintain in a position over time," circumstantial "keep" means "maintain in a role in an event or situation over time."

We will formalize (10.23a,b) as (10.24a,b). Since the subordinate clause is missing its subject, its semantic structure has an open argument place, filled by the variable i. This variable is bound to the theme of the main clause by coindexing, just as we bound [ACTORS] to [ACTIONS] in section 9.4. 4 For convenience, the subordinate clause has been left otherwise unanalyzed semantically.

(10.24)

a. [Event STAYCirc ([Fred]i,
      [Place ATCirc ([Event i COMPOSE QUARTETS])])]

b. [CAUSE ([LOUISE], [STAYCirc ([FRED]i,
      [Place ATCirc ([Event i COMPOSE QUARTETS])])])]

Thus we find the verb "keep" expressing STAY or its causative in every semantic field studied so far. That all these apparently disparate uses can be subsumed under a single semantic analysis is strong evidence for the Thematic Relations Hypothesis; under the Grammatical Constraint, this is the most general and desirable case possible.

With this analysis of "keep," it is easy to see how to analyze the aspectual verbs "start" and "stop" as circumstantial GO:

(10.25)

a. Ludwig started composing quartets.
   [GOCirc ([LUDWIG]i,
         [Path TOCirc ([i COMPOSE QUARTETS])])]

b. Ludwig stopped composing quartets.
   [GOCirc ([LUDWIG]i,
         [Path FROMCirc ([i COMPOSE QUARTETS])])]

These have the expected inference patterns for GO TO and GO FROM, given the definition of circumstantial location: (10.25a) asserts that at the beginning of the event Ludwig was not composing quartets and at the end he was; (10.25b) asserts the oppositejust what we want for "start" and "stop."

The missing circumstantial function is BE, and obligingly, "be" appears in a parallel construction:

(10.26)

Ludwig is composing quartets.
[State BECirc ([LUDWIG]i,
      [Place ATCirc ([i COMPOSE QUARTETS])])]

"Be" in (10.26) is of course the progressive aspect, which is ordinarily analyzed as an auxiliary rather than a main verb. On the other hand, on the strength of various syntactic parallelisms with "start," "stop," and "keep," Emonds (1976) argues that progressive "be" is indeed a main verb. Woisetschlaeger (1976) argues that there are two distinct senses of progressive aspect, only one of which patterns with "start," "stop," and "keep"; he treats this sense as a main verb and the other as an auxiliary. Without going into the details of these arguments, we may note that they support the semantic analysis of (10.26).

Let us look briefly at what the conceptual structure in (10.26) says: a situation obtains in which Ludwig is in the midst of an event of composing quartets. In effect, BECirc takes a snapshot of a state in the middle of an event. This explains why progressive aspect (in this reading) is characteristic of event and not state sentences: it makes sense to freeze events in mid-course, but since states already pertain to a point in time, there is no mid-course to freeze.

A selection of causatives with circumstantial functions appears in (10.27). ((10.23b) is another example.)

(10.27)

a. Sue forced/pressured/tricked/talked Jim into singing.
   Sue got/forced/caused/coerced Jim to sing.
   [CAUSE ([SUE], [GOCirc ([JIM]$_i$, [TOCirc ([i SING])])])]

b. Sue kept/restrained/prevented Jim from singing.
   [CAUSE ([SUE], [STAYCirc (JIM]$_i$,
                              [NOT ATCirc ([i SING])])])]

c. Sue allowed/permitted Jim to sing.
   [LET ([SUE], [GOCirc ([JIM]$_i$, [TOCirc ([i SING])])])]

d. Sue released Jim from singing.
   [LET ([SUE], [GOCirc ([JIM]$_i$, [FROMCirc ([i SING])])])]

e. Sue exempted Jim from singing.
   [LET ([SUE], [STAYCirc ([JIM]$_i$,
                              [NOT ATCirc ([i SING])])])]

The only novel part of these representations is the representation of "from" in (10.27b,e) as NOT AT. This is parallel to the spatial sense found in "stay *away from x*" (i.e., "someplace other than at *x*"), so it is independently motivated. (However, it treats this sense of "from" as unrelated to the source-function expressed by "from," which is doubtless a mistake. For the sake of brevity, I leave the issue unexplored here.)

The familiar inference patterns for CAUSE, LET, GO, and STAY appear here as usual. In (10.27a), Sue's action results in Jim's coming to sing (note the use of spatial "come to" here in a circumstantial sense). In (10.27b), Sue's action results in Jim's continuing *not* to sing. In (10.27c), Sue could have prevented Jim from singing, but she didn't, so Jim probably sang. In (10.27d), Sue was forcing Jim to sing, and now allowed him to stop; in (10.27e), Sue could have forced Jim to sing, but chose not to. In these last two, Jim ends up probably not singing. 5

So far, all the circumstantial expressions we have examined have the reference [EVENT] as an argument of AT, TO, or FROM. From a strictly logical point of view this is all there should be: either one is involved in an event or one is not. But evidently the projected world has more to talk about than strict logic. Consider (10.28).

(10.28)

a.
$$\text{You are} \begin{Bmatrix} \text{(nowhere) close to} \\ \text{(not) far from} \\ \text{on the verge of} \end{Bmatrix} \text{finishing this book.}$$

b.
$$\text{You are} \begin{Bmatrix} \text{on the way to} \\ \text{getting close to} \end{Bmatrix} \text{finishing this book.}$$

These expressions, obviously spatially inspired, show that there is a notion of circumstantial *distance*. This is a nonmetricizable sort of distance, to be sure; but, like scales of distance with nonmetricizable adjectives, it is still well-defined in a relative sense. Roughly, one is closer to a reference event if there are fewer independent steps required to bring the event about, if there are fewer places left where matters can slip up and foil one's plans. One is *traversing* a circumstantial path to a reference event if one is carrying out preliminary steps toward the bringing about of the event. (Note again the inevitability of spatial language in describing this, as for example in "steps toward . . . ")

One can traverse part of a circumstantial path without reaching the reference event, as in "Gustav got close to finishing his symphony, but didn't succeed." This is entirely parallel to the spatial "Gustav got close to the house, but didn't make it all the way there." This provides an explication of the verbs "manage" and "succeed." From a logical point of view these verbs are pleonastic: (10.29a) always has the same truth value as (10.29b), and its negation (10.29c) always has the same truth value as (10.29d).

(10.29)

a.
$$\text{Sam} \begin{bmatrix} \text{succeeded in finishing the book.} \\ \text{managed to finish the book.} \end{bmatrix}$$

b. Sam finished the book.

c.
$$\text{Sam didn't} \begin{bmatrix} \text{succeed in finishing the book.} \\ \text{manage to finish the book.} \end{bmatrix}$$

d. Sam didn't finish the book.

Why do these verbs exist, if they do not alter truth values? The reason is that they express traversal of a circumstantial path to the reference

event, hence allude to the presence of circumstantial obstacles that were surmounted along the way.

Circumstantial paths crop up in another class of verbs, studied by Cornu (1980). Compare the verbs in (10.27a) with those in (10.30).

(10.30)

Sue urged/encouraged/pressured Jim to sing.

In (10.30), Jim's singing is not a logical inference as it was in (10.27a). It is, however, an invited inference that can be canceled by "but he didn't do it." The difference between (10.27a) and (10.30) is precisely that between spatial GO TO and GO TOWARD: the former logically implies the reaching of the reference object, but with the latter, the reaching of the reference object is only an invited inference, easily canceled. Going toward means getting closer, without necessarily guaranteeing achievement. Thus (10.31) appears to be altogether appropriate to represent (10.30).

(10.31)

[CAUSE ([SUE], [GO_{Circ} ([JIM]_i,
                              [TOWARD_{Circ} ([i SING])])])]

This analysis is especially appealing in light of the lexical doublet "pressure NP *into*," in the class (10.27a), and "pressure NP *to*," in the class (10.30); one would like to minimize the semantic differences between them.

Analyzing (10.30) as (10.31) opens a fascinating range of verbs to analysis. "Discourage" is obviously CAUSE TO GO_{Circ} AWAY-FROM_{Circ}, the opposite of "encourage." "Intend" is quite possibly ORIENT_{Circ} TOWARD_{Circ}, as suggested by its synonym "aim." This leads to analyses of "persuade," "convince," and "dissuade" as causatives of ORIENT_{Circ}. Enterprising readers can no doubt extend the list.

Finally, consider a pseudospace so degenerate that it has only a single reference location: the *existential* field.

(10.32)

Existential field:
a. [THINGS] and [STATES] can serve as theme.

b. There is one reference region, called [EX], expressed by "existence."

This gives us expressions like "be in existence," "be out of existence," "come into existence," "go out of existence," "stay in existence," "bring into existence," and "keep in existence" as obvious realizations of the fundamental state- and event-functions. Moreover, "exist,"