

# 1 Introduction

## 1.1 THE CONCEPT OF CONSTRUCTIONS

What is it children learn when they learn to speak a language? What is the nature of verb meaning and what is its relation to sentential meaning? How and to what extent are novel utterances based on previously learned utterances?

These questions are addressed here through a study of basic sentence types—the “simple sentences” of traditional grammarians. A central thesis of this work is that basic sentences of English are instances of *constructions*—form–meaning correspondences that exist independently of particular verbs. That is, it is argued that constructions themselves carry meaning, independently of the words in the sentence.

The notion *construction* has a time-honored place in linguistics. Traditional grammarians have inevitably found it useful to refer to properties of particular constructions. The existence of constructions in the grammar was taken to be a self-evident fact that required little comment. In the early stages of transformational grammar (Chomsky 1957, 1965), constructions retained their central role, construction-specific rules and constraints being the norm. In the past two decades, however, the pretheoretical notion of construction has come under attack. Syntactic constructions have been claimed to be epiphenomenal, arising solely from the interaction of general principles (Chomsky 1981, 1992); the rejection of constructions in favor of such general principles is often assumed now to be the only way to capture generalizations across patterns.

At the same time, the rising tide of interest in semantic and pragmatic properties has led to a renewed focus on the idiosyncratic properties of particular sentence patterns (cf. Levin 1993, for example). In order to reconcile the theoretical desire for construction-independent principles with the empirical necessity of recognizing pattern-specific properties, all such idiosyncratic properties have been attributed to individual lexical items, lexical entries being the last refuge of the idiosyncratic.

There is no question that a large amount of information is contributed by individual lexical items (cf. chapters 2 and 5). However, in this work it is argued that an entirely lexically-based, or bottom-up, approach fails to account for the full range of English data. Particular semantic structures together with their associated formal expression must be recognized as constructions independent of the lexical items which instantiate them.

This monograph thus represents an effort to bring constructions back to their rightful place on center stage by arguing that they should be recognized as theoretical entities. Single-clause patterns hold a special interest because these cases clearly lie at the heart of any theory of grammar. If it can be shown that constructions are essential to a description of the domain of simple clauses, then it must be recognized that constructions are crucial to the description of language. Chapters 3 and 4 argue that empirical generalizations across constructions can in fact naturally be captured within a construction-based framework.

Another goal of this monograph is to explicate the semantics associated with particular clausal patterns. The semantic properties to be discussed must be accounted for by any framework, regardless of where the semantics is encoded or what one's assumptions about the lexicon and syntax are.

It has long been recognized that differences in complement configuration are often associated with differences in meaning. For example, the ditransitive requires that its goal argument be animate, while the same is not true of paraphrases with *to*:

- (1) a. I brought Pat a glass of water. (ditransitive)  
b. I brought a glass of water to Pat.
- (2) a. \*I brought the table a glass of water. (ditransitive)  
b. I brought a glass of water to the table. (Partee 1965: 60)

Fillmore (1968, fn. 49) noted that sentences such as the following differ in meaning:

- (3) a. Bees are swarming in the garden.  
b. The garden is swarming with bees.

(3b) suggests that the whole garden is full of bees, whereas (3a) could involve bees in only a part of the garden.

Anderson (1971) observed that the following sentences also differ in meaning:

- (4) a. I loaded the hay onto the truck.  
b. I loaded the truck with the hay.

While (4b) implies that the truck is entirely filled with hay (or at least relevantly affected), no such implication exists in (4a).

Works by Green, Oehrle, Bolinger, Borkin, and Wierzbicka and by Interpretive Semanticists such as Chomsky, Partee, and Jackendoff have drawn attention to systematic differences in meaning between sentences with the same lexical items in slightly different constructions.<sup>1</sup> Borkin (1974), for example, provides the following contrast:

- (5) a. When I looked in the files, I found that she was Mexican.  
 b. ?When I looked in the files I found her to be Mexican.  
 c. \*When I looked in the files I found her Mexican.

Borkin argues that the pattern in (5c) is only possible with verbs of proposition when the proposition expressed is considered to be a matter of judgment, as opposed to a matter of fact. The pattern in (5b) prefers but does not require the proposition to express judgments, and the full clausal form with *that*-complementizer in (5a) freely allows matters of judgment or fact.

Wierzbicka (1988) contrasts (6a) and (6b):

- (6) a. I am afraid to cross the road.  
 b. I am afraid of crossing the road.

Only in (6a) is the speaker presumed to have some intention of crossing the road. This difference in interpretation is argued to account for why (7a) is infelicitous unless the falling is interpreted as somehow volitionally intended:<sup>2</sup>

- (7) a. #I am afraid to fall down.  
 b. I am afraid of falling down.

Similar observations of subtle differences in meaning led Bolinger to conclude: "A difference in syntactic form always spells a difference in meaning" (1968:127). The same hypothesis—which we may term the Principle of No Synonymy of Grammatical Forms—has been formulated by Givón (1985), Kirsner (1985), Langacker (1985), Clark (1987), and Wierzbicka (1988). It will be adopted here as a working hypothesis.<sup>3</sup>



In this monograph, I explore the idea that *argument structure constructions* are a special subclass of constructions that provides the basic means of clausal expression in a language.<sup>4</sup> Examples of English argument structure constructions to be discussed here include the following:

- |                    |                         |                                                           |
|--------------------|-------------------------|-----------------------------------------------------------|
| 1. Ditransitive    | X CAUSES Y TO RECEIVE Z | Subj V Obj Obj <sub>2</sub><br>Pat faxed Bill the letter. |
| 2. Caused Motion   | X CAUSES Y TO MOVE Z    | Sub V Obj Obl<br>Pat sneezed the napkin off the table.    |
| 3. Resultative     | X CAUSES Y TO BECOME Z  | Subj V Obj Xcomp<br>She kissed him unconscious.           |
| 4. Intrans. Motion | X MOVES Y               | Subj V Obl<br>The fly buzzed into the room.               |

On a constructional approach to argument structure, systematic differences in meaning between the same verb in different constructions are attributed directly to the particular constructions. We will see that if we consider various constructions on their own terms, interesting generalizations and subtle semantic constraints emerge. Several constructions can be shown to be associated with a family of distinct but related senses, much like the polysemy recognized in lexical items. Moreover, these constructions themselves are shown to be interrelated.

The analysis I am going to propose draws on research in Construction Grammar (cf. Fillmore 1985b, 1987, 1988, 1990; Fillmore & Kay 1993; Lakoff 1987; Fillmore, Kay & O'Connor 1988; Brugman 1988; Kay 1990; Lambrecht 1990, 1994; Goldberg 1991a, 1992a; Michaelis 1993; Koenig 1993; Filip 1993). According to Construction Grammar, a distinct construction is defined to exist if one or more of its properties are not strictly predictable from knowledge of other constructions existing in the grammar:<sup>5</sup>

C is a CONSTRUCTION iff<sub>def</sub> C is a form–meaning pair  $\langle F, S \rangle$  such that some aspect of F, or some aspect of S, is not strictly predictable from C's component parts or from other previously established constructions.

Constructions are taken to be the basic units of language. Phrasal patterns are considered constructions if something about their form or meaning is not strictly predictable from the properties of their component parts or from other constructions.<sup>6</sup> That is, a construction is posited in the grammar if it can be shown that its meaning and/or its form is not compositionally derived from other constructions existing in the language (cf. section 1.2). In addition, expanding the pretheoretical notion of construction somewhat, morphemes are clear instances of constructions in that they are pairings of meaning and form that are not predictable from anything else (Saussure 1916).<sup>7</sup> It is a consequence of this definition that the lexicon is not neatly differentiated from the rest of grammar.

Constructions can be understood to correspond to the "listemes" of DiSciullo and Williams (1987)—that is, the entities of grammar that must be listed. However, our view of the collection of listemes is radically different from theirs. They state categorically: "If conceived of as the set of listemes, the lexicon is incredibly boring by its very nature. It contains objects of no single specifiable type (words, VPs, morphemes, perhaps intonational patterns.

and so on), and those objects that it does contain are there because they fail to conform to interesting laws. The lexicon is like a prison—it contains only the lawless, and the only thing that its inmates have in common is lawlessness” (p. 3). This view of the lexicon, or what might be better termed the *construction*, following Jurafsky (1992), is rejected in the present work. The collection of constructions is not assumed to consist of an unstructured set of independent entities, but instead it is taken to constitute a highly structured lattice of inter-related information. The relations between constructions are discussed in chapters 3 and 4.

A basic axiom that is adopted is: knowledge of language is knowledge. Many of the findings of the following chapters are thus expected, particularly that linguistic constructions display prototype structure and form networks of associations. Hierarchies of inheritance and semantic networks, long found useful for organizing other sorts of knowledge, are adopted for explicating our linguistic knowledge (cf. Quillian 1968; Bobrow & Winograd 1977; Fahlman 1979; Wilensky 1986; Norvig & Lakoff 1987; Jurafsky 1992).

On the basis of research on language acquisition by Clark (1978), Slobin (1985), and Bowerman (1989), together with the findings presented here, it is hypothesized that

Simple clause constructions are associated directly with semantic structures which reflect scenes basic to human experience.<sup>3</sup>

In particular, constructions involving basic argument structure are shown to be associated with dynamic scenes: experientially grounded gestalts, such as that of someone volitionally transferring something to someone else, someone causing something to move or change state, someone experiencing something, something moving, and so on. It is proposed that the basic clause types of a language form an interrelated network, with semantic structures paired with particular forms in as general a way as possible.



This book is structured as follows. The rest of this chapter presents arguments for adopting a constructional approach to argument structure. Chapter 2 analyzes the nature of verb meaning, the nature of constructional meaning, and the relation between the two. Chapter 3 suggests an account of how to capture relations among constructions and generalizations across constructions; an inheritance hierarchy of constructions is posited, and the inheritance links themselves are treated as objects in the system. In chapter 4, the idea of a monostratal theory is defended, and the way linking generalizations are to be captured within a constructional approach is discussed. Chapter 5

presents an account of the partial productivity of constructions; this work adapts insights from Pinker (1989) to a system without lexical rules.

Chapters 6–9 involve more specific analyses of several English constructions: the ditransitive construction (e.g., *Chris faxed her the news*), the “caused-motion” construction (e.g., *Sally sneezed the napkin off the table*), the resultative construction (e.g., *Sam talked himself hoarse*), and the way construction (e.g., *Bob elbowed his way through the crowd*). Specific arguments for the existence of each of these constructions are given in those chapters.

## 1.2 A BRIEF INTRODUCTION TO CONSTRUCTION GRAMMAR

The basic tenet of Construction Grammar as developed in Fillmore & Kay 1993, Fillmore, Kay & O'Connor 1988, Lakoff 1987, Brugman 1988, Lambrecht 1994, is that traditional constructions—i.e., form–meaning correspondences—are the basic units of language.

Theorists working within this theory share an interest in characterizing the *entire* class of structures that make up language, not only the structures that are defined to be part of “core grammar.” This interest stems from the belief that fundamental insights can be gained from considering such non-core cases, in that the theoretical machinery that accounts for non-core cases can be used to account for core cases. In addition, much of actual corpus data involves such non-core cases. Construction Grammarians also share an interest in accounting for the conditions under which a given construction can be used felicitously, since this is taken to be part of speakers’ competence or knowledge of language; from this interest stems the conviction that subtle semantic and pragmatic factors are crucial to understanding the constraints on grammatical constructions.

These tenets, which in many respects hearken back to Generative Semantics (e.g. Lakoff 1965, 1970a,b, 1971, 1972, 1976; Lakoff & Ross 1976; Langacker 1969; Postal 1971; Dowty 1972; Keenan 1972; McCawley 1973, 1976) are also shared by the theory of Cognitive Grammar (Langacker 1987a, 1991), the framework implicit in much of Wierzbicka’s work (e.g., Wierzbicka 1988), and by many functionalist approaches to grammar (e.g., Bolinger 1968; DeLancey 1991; Givón 1979a,b; Haiman 1985a; Foley & Van Valin 1984). Work in Generalized Phrase Structure Grammar (GPSG) and in Head-Driven Phrase Structure Grammar (HPSG) (Gazdar et al. 1985; Pollard & Sag 1987, 1994) also emphasizes the central role of the *sign* in grammar. In many ways, aspects of the proposals made here are also compatible with recent work by Levin (1985), Levin & Rapoport (1988), Pinker (1989) and Jackendoff (1990a). Some similarities and differences are discussed below.

Owing in part to the fact that Construction Grammar has grown largely out

of work on frame semantics (Fillmore 1975, 1977b, 1982, 1985a) and an experientially based approach to language (Lakoff 1977, 1987), the approach to semantics that is adopted by the theory is one that crucially recognizes the importance of speaker-centered “construals” of situations in the sense of Langacker (1987a, 1991). This approach to semantics is discussed in chapter 2.



In Construction Grammar, no strict division is assumed between the lexicon and syntax. Lexical constructions and syntactic constructions differ in internal complexity, and also in the extent to which phonological form is specified, but both lexical and syntactic constructions are essentially the same type of declaratively represented data structure: both pair form with meaning. It is not the case, however, that in rejecting a strict division, Construction Grammar denies the existence of any distinctly morphological or syntactic constraints (or constructions). Rather, it is claimed that there are basic commonalities between the two types of constructions, and moreover, that there are cases, such as verb–particle combinations, that blur the boundary.

Another notion rejected by Construction Grammar is that of a strict division between semantics and pragmatics. Information about focused constituents, topicality, and register is represented in constructions alongside semantic information.

Construction Grammar is generative in the sense that it tries to account for the infinite number of expressions that are allowed by the grammar while attempting to account for the fact that an infinite number of other expressions are ruled out or disallowed. Construction Grammar is not transformational. No underlying syntactic or semantic forms are posited. Instead, Construction Grammar is a monostratal theory of grammar like many other current theories, including Lexical Functional Grammar (LFG) (Bresnan 1982), Role and Reference Grammar (Foley & Van Valin 1984), GPSG (Gazdar et al. 1985), HPSG (Pollard & Sag 1987, 1994), and Cognitive Grammar (Langacker 1987a, 1991). The rationale for this and some consequences are discussed in chapter 4.

It is perhaps easiest to explore the constructional approach by first contrasting it with the relevantly similar proposal described in the following section.

### 1.3 AN ALTERNATIVE ACCOUNT: LEXICOSEMANTIC RULES

The recognition of subtle semantic differences between related syntactic (subcategorization) frames has been growing, and there has also been increasing focus on the fact that there appears to be a strong correlation between the meanings of verbs and the syntactic frames they can occur in, leading many researchers to speculate that in any given language the syntactic subcategori-

zation frames of a verb may be uniquely predictable from the verb's lexical semantics (e.g., Levin 1985; Chomsky 1986; Carter 1988; Levin & Rapoport 1988; Rappaport & Levin 1988; Pinker 1989; Gropen et al. 1989).

The following factors have led these theorists to postulate lexical rules which are designed to operate on the semantic structures of lexical items: (1) overt complement structure appears to be predictable by general linking rules that map semantic structure onto syntactic form, and (2) the same verb stem often occurs with more than one complement configuration.

For example, Pinker (1989) proposes that the prepositional/ditransitive alternation (the "dative" alternation) results from a semantic rule rather than being the product of a syntactic transformation. Specifically, he suggests that productive use of the ditransitive syntax is the result of a lexicosemantic rule which takes as input a verb with the semantics 'X CAUSES Y to GO TO Z' and produces the semantic structure 'X CAUSES Z to HAVE Y'. The double object syntax, he argues, is then predictable from near-universal linking rules mapping the arguments of a verb with the meaning 'X CAUSES Z to HAVE Y' into the ditransitive form. In this way, Pinker argues that the dative rule produces a "conceptual gestalt shift,"—that it is, in effect, a semantic operation on lexical structure (cf. also Gropen et al. 1989).

The general approach can be outlined as follows:

- 1a. The syntactic complement configuration of a clause is taken to be uniquely predictable from the semantic representation of the matrix verb. The mapping from semantic representations to particular complement configurations is performed via universal, or near-universal, linking rules.
- 1b. Different syntactic complement configurations therefore reflect differences in the semantic representations of the main verb.
2. Different semantic representations of a particular verb stem, i.e., different verb senses, are related by generative lexical rules which take as input a verb with a particular semantics and yield as output a verb with a different semantics.
3. Differences in semantics are not necessarily truth-functional differences, but may represent a different construal of the situation being described: that is, the relevant semantics is speaker-based.

These principles are detailed most explicitly in Pinker 1989, but are also shared by Levin 1985, Levin & Rapoport 1988, and Gropen et al. 1989.

By postulating rules that operate on semantic structure, as opposed to rules or transformations that are purely or primarily syntactic, these theories manage to incorporate important insights. As was discussed above, different constructions are typically, possibly always, accompanied by slightly different semantic interpretations: these semantic differences are respected as soon as the

forms are learned (Bowerman 1982; Gropen et al. 1989). By postulating semantics-changing rules, as opposed to syntactic rules with additional semantic constraints, such theories capture the insight that changes in complement configurations are crucially semantic. Regularities in the syntax are captured by linking rules mapping the semantic structure to surface form.

To a large degree, as will become apparent below, the lexical rule approach is directly comparable to the approach being proposed here. They share the emphasis on semantic differences among different complement configurations. The strongest differences between the two approaches stem from the increased focus of the present approach on the nature of the relation between verb and construction (the lexical rule approach represents this relation only implicitly in the statement of the rule itself). By recognizing constructions and verbs to be interrelated but independent, the nature of constructional meaning, the principles that relate verb and construction, and the relations among constructions are brought to the foreground. These topics are the focus of much of the present work. In addition, on the present approach it is not necessary to posit an additional verb sense for each new syntactic configuration in which the verb appears. Several general reasons to prefer the constructional approach to the lexical rule approach just described are detailed in the following section. Specific arguments for the existence of each construction analyzed in chapters 6–9 are provided in those chapters.

## 1.4 ADVANTAGES OF THE CONSTRUCTION ACCOUNT

### 1.4.1 Implausible Verb Senses Are Avoided

The constructional approach avoids the problem of positing implausible verb senses to account for examples such as the following:

- (8) He sneezed the napkin off the table.
- (9) She baked him a cake.
- (10) Dan talked himself blue in the face.

In none of these cases does the verb intuitively require the direct object complement. To account for (8), for example, a lexicosemantic theory would have to say that *sneeze*, a parade example of an intransitive verb, actually has a three-argument sense, 'X CAUSES Y to MOVE Z by sneezing'. To account for (9), such a theory would need to claim that there exists a special sense of *bake* that has three arguments: an agent, a theme, and an intended recipient. This in effect argues that *bake* has a sense which involves something like 'X INTENDS to CAUSE Y to HAVE Z'. To account for (10), the theory would need to postulate a special sense of *talk*, 'X CAUSES Y to BECOME Z by talking'.

If additional senses were involved, then it would follow that each of these

verbs is ambiguous between its basic sense and its sense in the syntactic pattern above. Therefore we would expect that there would be some language that differentiates between the two senses by having two independent (unrelated) verb stems. For example, alongside the equivalent of the English word *sneeze* we might expect to find another stem – say, *moop*—that meant ‘X CAUSES Y to MOVE Z by sneezing’. However, to my knowledge there is no language that has distinct verb stems for any of the meanings represented by examples (8–10).

On a constructional approach, we can understand aspects of the final interpretation involving caused motion, intended transfer, or caused result to be contributed by the respective constructions. That is, we can understand skeletal constructions to be capable of contributing arguments. For example, we can define the ditransitive construction to be associated directly with agent, patient, and recipient roles, and then associate the class of verbs of creation with the ditransitive construction. We do not need to stipulate a specific sense of *bake* unique to this construction. In general, we can understand the direct objects found in the above examples to be licensed not directly as arguments of the verbs but by the particular constructions. This idea is discussed in more detail in chapter 2.

Other examples where it is implausible to attribute the complement configuration and the resulting interpretation directly to the main verb include the following:

- (11) “Despite the President’s efforts to *cajole* or *frighten* his nine million subjects into line . . .” (*New York Times*, 29 May 1993)
- (12) “My father *frowned* away the compliment and the insult.” (Stephen McCauley, *Easy Way Out*, 1993)
- (13) “Sharon was exactly the sort of person who’d *intimidate* him into a panic.” (Stephen McCauley, *Easy Way Out*, 1993)
- (14) “I cannot inhabit his mind nor even *imagine* my way through the dark labyrinth of its distortion.” (Oxford University Press corpus)
- (15) Pauline *smiled* her thanks. (Levin & Rapoport 1988)
- (16) The truck *rumbled* down the street. (Levin & Rappaport Hovav 1990b)

The suggestion being made here is to account for these cases, in which the whole is not built up from the lexical items in a straightforward way, by postulating a construction that is itself associated with meaning.

#### 1.4.2 Circularity Is Avoided

Another important advantage of the construction-based approach is that it avoids a certain circularity of analysis resulting from the widespread claim in current linguistic theories that syntax is a projection of lexical requirements.

This claim is explicit in the Projection Principle of Government and Binding Theory (GB) (Chomsky 1981), the Bijection Principle of Lexical Functional Grammar (Bresnan 1982), and in all current accounts which attempt to predict overt syntax from semantic roles or theta role arrays. In all of these frameworks, it is the verb which is taken to be of central importance. That is, it is assumed that the verb determines how many and which kinds of complements will co-occur with it. In this way, the verb is analogized to the predicate of formal logic, which has an inherent number of distinct arguments. The verb is taken to be an  $n$ -place relation "waiting" for the exactly correct type and number of arguments. But note, now, that an ordinary verb such as *kick* can appear with at least eight distinct argument structures:

1. Pat kicked the wall.
2. Pat kicked Bob black and blue.
3. Pat kicked the football into the stadium.
4. Pat kicked at the football.
5. Pat kicked his foot against the chair.
6. Pat kicked Bob the football.
7. The horse kicks.
8. Pat kicked his way out of the operating room.

Theories which assume that the verb directly determines particular complement configurations are forced to claim that *kick* is a binary relation with agent and patient arguments and therefore occurs with transitive syntax, except in *Pat kicked Bob the football*, in which it is a ternary relation with agent, recipient, and patient arguments and therefore occurs in the ditransitive construction, and in *Pat kicked the football into the stadium*, where *kick* is again ternary, but now with agent, theme, and goal arguments, and must "therefore" occur with the direct object and prepositional complements; and so on. Thus both the evidence for the claim that *kick* has a particular  $n$ -argument sense *and* the explanation for *kick* having the corresponding complement configuration come from the fact that *kick* can occur overtly with a particular  $n$ -complement construction. That is, it is claimed that *kick* has an  $n$ -argument sense on the basis of the fact that *kick* occurs with  $n$  complements; it is simultaneously argued that *kick* occurs with  $n$  complements because it has an  $n$ -argument sense. This is where the circularity arises.

A constructional approach to argument structure allows us to avoid the circularity of arguing that a verb is an  $n$ -ary predicate and "therefore" has  $n$  complements when and only when it has  $n$  complements. Instead, the ternary relation, for example, is directly associated with the skeletal ditransitive construction. The verb, on the other hand, is associated with one or a few basic senses which must be *integrated* into the meaning of the construction. Under

what conditions this is possible is the subject of the following chapter. Instead of positing a new sense every time a new syntactic configuration is encountered and then using that sense to explain the existence of the syntactic configuration, a constructional approach requires that the issue of the interaction between verb meaning and constructional meaning be addressed.

### 1.4.3 Semantic Parsimony

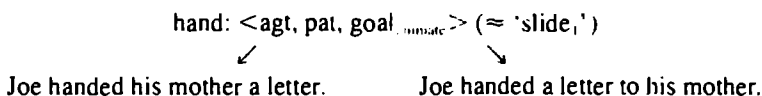
Levin (1985) suggests that evidence for different verb senses does exist. For example, she argues that "there is evidence that when the verb *slide* is found in the double object construction, . . . its sense is not the purely physical transfer sense of *slide* but rather a transfer of possession sense" (p. 35). She cites the fact that "the goal argument of a change of possession verb must denote an entity capable of ownership, but the goal argument of a change of location verb need not," as illustrated by her examples (17a, b).

- (17) a. She slid Susan/\*the door the present.  
b. She slid the present to Susan/to the door.

Thus two distinct senses of *slide* would be posited to account for the contrast in (17). One sense of *slide*, 'slide<sub>1</sub>', would constrain its goal to be animate, while the other, 'slide<sub>2</sub>', would have no such constraint. The two different syntactic realizations are claimed to follow from universal or near-universal linking patterns mapping semantic argument structures to overt complement configurations. The linking rules would be sensitive to the fact that 'slide<sub>1</sub>' requires its goal to be animate, as follows:



However, general linking rules do not insure that 'slide<sub>1</sub>' will only occur with the ditransitive construction, as is desired. Verbs which uncontroversially *lexically* constrain their goals to be animate—such as *give* or *hand*—can be used with both syntactic patterns:



That is, we would need to stipulate that 'slide<sub>1</sub>' may only occur with the ditransitive construction. Instead of positing both an additional sense of *slide* and a stipulation that this sense can only occur in the ditransitive construction,

we can attribute the constraint that the goal must be animate directly to the construction.

Still, it might be argued that 'slide<sub>1</sub>' is not actually constrained to appear ditransitively, and that it is this sense which (just like *give* and *hand*) appears in expressions such as (18):

(18) She slid the present to Susan.

(The reason we might assume that (18) involves an unconstrained sense of *slide* is that *She slid the present to the door* is also acceptable.) This does not alleviate the problem, however; we still need to insure that the ditransitive construction can only occur with 'slide<sub>1</sub>'. That is, instead of needing to stipulate that 'slide<sub>1</sub>' can only appear ditransitively, we would now need to posit a constraint on the construction that permits it to only occur with verbs which constrain their goals to be animate. But with this constraint in place, there is no need to posit an additional verb sense.

More generally, I concur with Levin that the semantics of (and constraints on) the full expressions are different whenever a verb occurs in a different construction. But these differences need not be attributed to different verb senses; they are more parsimoniously attributed to the constructions themselves.

#### 1.4.4 Compositionality Is Preserved

A construction is posited in the grammar if and only if something about its form, meaning, or use is not strictly predictable from other aspects of the grammar, including previously established constructions. In order to understand this principle, we must first consider the notion of *compositionality*. Frege is generally acknowledged to have originally formulated the idea that semantics need be compositional: the meaning of every expression in a language must be a function of the meanings of its immediate constituents and the syntactic rule used to combine them.

Montague stated the analogous condition that there must be a homomorphism from syntax to semantics; that is, there must be a structure-preserving mapping from syntax to semantics. Letting  $\sigma$  be a function from syntax to semantics, '+<sub>syn-comp</sub>' a rule of syntactic composition, and '+<sub>sem-comp</sub>' a rule of semantic composition, the following is claimed hold:

(19)  $\sigma(x +_{\text{syn-comp}} y) = \sigma(x) +_{\text{sem-comp}} \sigma(y)$

The meaning of the expression is therefore taken to result from applying to the meanings of the immediate constituents a semantic operation which directly corresponds to the relevant syntactic operation.

Dowty (1979) observes that the claim is intended to imply that the relation between syntactic expression and semantic representation is straightforward and direct. That is, '+<sub>syn-comp</sub>', or syntactic composition, must be straightforwardly related to '+<sub>sem-comp</sub>', or semantic composition. The same principle, that the semantic rules of combination must directly reflect the syntactic rules of combination, is expressed by Gazdar et al. (1985), also working within the Montague Grammar tradition: "We assume that there exists a universal mapping from syntactic rules to semantic translations . . . . We claim that the semantic type assigned to any lexical item introduced in a rule . . . and the syntactic form of the rule itself are sufficient to fully determine . . . the form of the semantic translation rule" (1985:8–9).

Because the rules of combination are so widely regarded as transparent, it is easy to overlook the fact that there are any substantive rules at all. For example, one researcher states: "In a strictly compositional language, all analytic content comes from the lexicon, and no semantic rules . . . are needed to account . . . [for the mechanism of] adding meaning to the sentence which is not directly contributed by some lexeme of the sentence."<sup>9</sup>

Even Jackendoff, who in fact does recognize nonlexical meaning (cf. section 10.1.1), states in the introduction to his 1990 monograph *Semantic Structures*: "It is widely assumed, and I will take for granted, that the basic units out of which a sentential concept is constructed are the concepts expressed by the words in the sentence, that is, *lexical* concepts" (Jackendoff 1990a:9). The transparent rule of composition for verbs that is typically assumed goes back to Frege (1879): the meaning of a verb is a predicate with a fixed arity *n* that takes *n* arguments and yields a proposition. In this way, the verb is taken to be the semantic *head* of the sentence, the element which determines the basic semantic structure of the clause.

This same idea is implemented in recent *unification-based* grammars (cf. Shieber et al. 1984; Shieber 1986), for example, LFG, GPSG, and HPSG, which make explicit the critical assumption that semantic features of the head percolate upward to the phrasal level; in particular, semantic features of the verb are assumed to percolate upward to determine the semantic features of the sentence (this is made explicit in the Head Feature Convention of GPSG and HPSG, and in the [ $\uparrow = \downarrow$ ] feature of heads in LFG).<sup>10</sup>

This view of the principle of compositionality can be shown to be inadequate. More substantive principles of composition—viewed here as constructions—are needed. This can be demonstrated by the existence of cases in which the requirements of the construction are in conflict with the requirements of the main verb. Two cases are discussed below: the Dutch impersonal passive construction and the English *way* construction.

### The Dutch Impersonal Passive Construction

Zaenen (1991) provides an argument for a constructional account of the Dutch impersonal passive. There is a constraint on the impersonal passive that the described situation be atelic:

- (20) \*Er werd opgestegen.  
There was taken off.
- (21) Er werd gelopen.  
There was run.
- (22) \*?Er werd naar huis gelopen.  
There was run home.

She notes that the acceptability of the sentence can be altered by the addition of particular adverbs:

- (23) Van Schiphol wordt er de hele dag opgestegen.  
From Schiphol there is taking off the whole day.
- (24) Er werd voortdurend naar huis gelopen.  
There was constantly run home.

Thus the constraint on the impersonal passive seems to be a constraint on the aspect of the entire expression, rather than one directly on the Aktionsart of the main verb. However, this being the case, the construction cannot be said to be lexically governed: the constraint must be associated with the construction as a whole.

Recognizing the controversial nature of such a proposal, Zaenen explicitly argues against the alternative move—postulating dual senses of each verb, one telic and one atelic. Her argument is based on the fact that another phenomenon in Dutch, auxiliary selection, crucially relies on the inherent Aktionsart of the main verb and *cannot* be altered by adverbial modification. The auxiliary *zijn* is chosen when the verb's Aktionsart is telic, regardless of whether the sentential expression is telic or atelic:

- (25) Hij is opgestegen.  
It has taken off.
- (26) Hij is dagelijks opgestegen.  
It has taken off daily.

The auxiliary *hebben*, on the other hand, is chosen when the verb's Aktionsart is atelic. A theory which posited two lexical items, with opposite Aktionsart specifications, would not be able to predict these facts about auxiliary selection. One could conceivably add further features to the description of the main

verbs, but such a move would only be motivated by the desire to avoid recognizing the effect of contextual factors independent of the verb. A more satisfactory solution is to posit a single verb sense and allow the impersonal passive to be sensitive to factors outside the main verb.

### The *Way* Construction

Another example arises from the constraints on the *way* construction, exemplified in (27) and discussed in chapter 9.

- (27) a. Pat fought her way into the room.  
       b. Volcanic material blasted its way to the surface.  
       c. The hikers clawed their way to the top.

Levin & Rappaport Hovav (1992), following Marantz (1992), have argued that the *way* construction is associated only with unergative verbs. At the same time, they have argued that verbs of directed motion are unaccusative (Levin & Rappaport Hovav 1992). On a lexical account, in which syntactic frames are projected from the verbs' lexical semantics, there is an inconsistency here. All verbs appearing in this construction would have to be considered directed motion verbs, since *way* expressions specifically assert motion along the designated path. This would lead one to the conclusion that such verbs are both unergative (since they occur in the *way* construction) and unaccusative (since they are directed motion verbs).<sup>11</sup>

Alternatively, one might postulate a constraint that the verbs involved must be unergative before they undergo a lexical rule which turns them into unaccusative verbs as expressed in this construction. But this would be an odd kind of constraint: one must worry about not only whether the verb is of the relevant kind as the output of the rule, but also whether the verb was derived in a particular way, in order to determine whether it will occur in this syntactic pattern. Typically, if a verb matches the output of a particular lexical rule, then it behaves like other verbs that have undergone the rule, whether or not it underwent the rule itself (see, e.g., Pinker 1989: 65ff.). By contrast, given the more complicated constraint needed here, one would need to know the derivational history of a particular item before one could determine whether it could take part in the argument structure of the *way* construction.

By recognizing the existence of contentful constructions, we can save compositionality in a weakened form: the meaning of an expression is the result of integrating the meanings of the lexical items into the meanings of constructions.<sup>12</sup> In this way, we do not need to claim that the syntax and semantics of the clause is projected exclusively from the specifications of the main verb.

### 1.4.5 Supportive Evidence from Sentence Processing

Certain psycholinguistic findings reported by Carlson and Tanenhaus (1988) suggest that uses of the same "core meaning" of a verb in different syntactic frames do not show the same processing effects that cases of real lexical ambiguity do. For example, notice that *set* truly has two different senses:

- (28) a. Bill set the alarm clock onto the shelf.  
b. Bill set the alarm clock for six.

*Load*, on the other hand, although it can readily appear in the alternate constructions in (29), according to Carlson and Tanenhaus's hypothesis (as well as the current account) retains the same core lexical meaning in both uses:

- (29) a. Bill loaded the truck onto the ship.  
b. Bill loaded the truck with bricks.

Carlson and Tanenhaus reasoned that if a reader or hearer initially selects an inappropriate sense of an ambiguous word like *set*, a garden path will result, effecting an increased processing load. On the other hand, if an inappropriate constructional use ("thematic assignment" on Carlson & Tanenhaus's account) is selected, the reanalysis will be relatively cost free since the sense of the verb remains constant and the verb's participant roles ("thematic roles" on Carlson and Tanenhaus's account) are already activated.

Sentences such as those in (28) and (29) were displayed on a CRT, and subjects were asked to decide as quickly as possible whether a given sentence "made sense." It was expected that subjects would anticipate an inappropriate sense of *set* or an inappropriate use of *load* approximately half the time. A theory which posits two distinct senses of *load* to account for the two uses in (29), analogous to the situation with *set* in (28), would presumably expect the two cases to work the same way. Carlson and Tanenhaus found, however, that misinterpreted lexical ambiguity creates a more marked processing load increase than misinterpreted uses of the same verb. The load increase was witnessed by subjects' longer reaction time to decide whether sentences such as (28) involving a true lexical ambiguity made sense, vis-à-vis sentences such as (29), as well as by a marked increase in the number of "no" responses to the question whether a given sentence made sense when a truly ambiguous verb was involved.<sup>13</sup> The data from 28 subjects are presented in the table below (adapted from Carlson & Tanenhaus 1988): mean reaction times in msec to those sentences judged to make sense are given; the percentages of sentences judged to make sense appear in parentheses:

| Type of ambiguity                                                   | Type of verb |            |
|---------------------------------------------------------------------|--------------|------------|
|                                                                     | Ambiguous    | Control    |
| Sense (e.g. <i>set</i> )                                            | 2445 (77%)   | 2290 (94%) |
| Variable constructions ("Thematic ambiguity,"<br>e.g. <i>load</i> ) | 2239 (92%)   | 2168 (93%) |

When sentences are divided into preferred and non-preferred sense or construction for a given pair of sentences, the difference in reaction times between different senses and different constructions is even more striking:

|                                               | Type of verb |         |
|-----------------------------------------------|--------------|---------|
|                                               | Ambiguous    | Control |
| Sense ambiguity                               |              |         |
| Preferred sense                               | 2277         | 2317    |
| Less-preferred sense                          | 2613         | 2264    |
| Variable constructions ("Thematic ambiguity") |              |         |
| Preferred assignment                          | 2198         | 2177    |
| Less-preferred assignment                     | 2268         | 2158    |

This finding is difficult to account for if one holds the view that different uses of a verb actually reflect lexical ambiguities. That is, on such a view it is difficult to distinguish different uses from different senses, since each different use would entail a different sense (and conversely, each different sense would entail a different use). On the other hand, the distinction found between verbs like *set* and those like *load* is not unexpected on the constructional approach proposed here, since it is claimed that different uses of the same verb in various constructions do not entail different senses of the verb. Thus we would not expect the same verb in different constructions to have the same effect as cases of real lexical ambiguity.

#### 1.4.6 Supportive Evidence from Child Language Acquisition

By recognizing that the meanings of verbs do not necessarily change when these verbs are used in different syntactic patterns—that the meaning of an expression also depends on the inherent semantics of the argument structure constructions—certain findings in language acquisition research can be made sense of.

Landau and Gleitman (1985) note that children acquire verb meanings with surprising ease, despite the fact that the situations in which verbs are used only constrain possible meanings to a very limited degree (cf. also Quine 1960). For

example, they note that their congenitally blind subject learned the meanings of *look* and *see* without undue difficulty, despite the fact that these meanings are nonphysical and, for this child, not directly experientially based. They propose that children rely on syntactic cuing, or *syntactic bootstrapping*, as they acquire verbal meaning. In particular, they argue that children make use of the set of syntactic frames that a verb is heard used with in order to infer the meaning of the verb. They argue that this is possible because syntactic frames are surface reflexes of verbal meanings: "The allowable subcategorization frames, taken together, often tell a semantically quite transparent story, for they mark some of the logical properties of the verb in question" (p. 140). Further, they assert that the use of a verb in a particular syntactic frame indicates that the verb has a particular component of meaning, one associated with that syntactic frame. Certain experimental work by other researchers substantiates the idea that syntactic frames aid in the acquisition of word meaning (see Brown 1957; Katz, Baker & McNamara 1974; Naigles 1990; Fisher et al. 1991; Gleitman 1992; Naigles et al. 1993).<sup>14</sup>

However, Pinker (1989) rightly criticizes Landau and Gleitman's formulation of the claim. He notes that if different syntactic frames are assumed to reflect different components of the meaning of verbs, as Landau and Gleitman assume, then taking the union of these different components of meaning across different syntactic frames will result in incorrect learning. For example, if the appearance of an *into*-phrase in *The ball floated into the cave* is taken to imply that *float* has a motion component to its meaning, then the child will incorrectly infer that it will not be possible to float without moving anywhere.

This is indeed a general problem for Landau and Gleitman's formulation. The occurrence of *kick* in the ditransitive construction (e.g., *Joe kicked Mary a ball*) cannot be taken as evidence that *kick*'s meaning has a transfer component, as their account would seem to imply. As we saw above in section 1.4.2, *kick* can occur in eight different syntactic patterns, most of which do *not* involve transfer.

Pinker's criticism rules out the possibility that even adult speakers could use the *set* of syntactic frames a verb is heard used with to determine the verb's meaning. It does so because each distinct syntactic frame is taken to reflect a different sense of the verb. This apparent paradox can be resolved by recognizing that syntactic frames are directly associated with semantics, independently of the verbs which may occur in them. Thus it is possible to recognize that to a large extent, verb meaning remains constant across constructions; differences in the meaning of full expressions are in large part attributable directly to the different constructions involved. On this view, *kick* has the same sense in each of the eight argument structures listed in section 1.4.2. The interpretations—

such as, 'X ACTS', 'X ACTS ON Y', 'X DIRECTS ACTION AT Y', 'X CAUSES Y to UNDERGO a CHANGE OF STATE'—are associated directly with the particular constructions involved. In this way, Landau and Gleitman's insight can be slightly reinterpreted. What the child hypothesizes, upon hearing a verb in a particular previously acquired construction, is not that the verb itself has the component of meaning associated with the construction, but rather that the verb falls into one of the verb clusters conventionally associated with the construction (cf. chapter 5).

Hearing a verb used in different constructions may then indeed aid in the acquisition of verb meaning. One way this might be accomplished is by triangulating the verb class that the verb must belong to. For example, if a child hears an unfamiliar verb occur in a particular construction that is known to be associated with, say, eight verb clusters, and the child also hears the verb used in a different construction that is known to be associated with, say, ten verb clusters, only some of which are shared with the former, the child can narrow down the possible class of verbs by examining only the intersecting clusters.

Contextual information is undoubtedly added into the equation, allowing the child to further narrow down the possible verb classes. That is, language learning does not take place in a vacuum. It is generally accepted that children's first understanding of lexical meaning is tied to the situations in which a word is heard used.<sup>15</sup>

Once constructions are recognized, the idea that the syntactic frames a verb is heard in can aid in determining verb meaning is made coherent. However, as it stands, this account presupposes that the child already knows certain verb classes to be conventionally associated with certain constructions; that is, this account presupposes that a fair number of verbs have already been learned, and so would not provide an account of bootstrapping from ground zero. Constructions would be allowed to aid in the acquisition of the meanings of novel verbs once a fair number of verbs had already been learned, but they would not be useful in acquiring the meanings of the first verbs as Landau and Gleitman have proposed.

Constructions could be claimed to play a more central role in the acquisition of verbal semantics if it were possible to delimit *a priori* the potential range of verb classes that might be associated with a construction. And in fact it seems there are only a handful of ways that verb meaning and constructional meaning can be related (cf. section 2.5). The necessity of triangulating the relevant verb cluster could be avoided then, since the meaning of the verb would be assumed to be related to the meaning of the construction in one of a small number of possible ways. What is crucial is that the verb's meaning need not directly reflect the meaning associated with the construction. The child's task would be

to determine whether the verb's meaning in fact did elaborate the meaning of the construction, or whether the verb coded, say, the means, manner, or result associated with the meaning of the construction.<sup>16</sup>

To summarize, by recognizing skeletal syntactic constructions as meaningful in their own right, it is possible to allow for multiple syntactic frames to be used as an aid in the acquisition of verb meaning. This is because it is not necessary to assume that every use of a particular lexical item in a different syntactic frame entails a different sense of the verb involved.

In the following section, traditional motivations for positing lexical rules to account for variability in syntactic expression are discussed, and it is argued that they are ultimately not persuasive reasons for rejecting a constructional approach.

### 1.5 TRADITIONAL MOTIVATIONS FOR LEXICAL RULES

There are a number of different types of lexical rule accounts which deal with the issue of variability of overt expression. Lexicalists argue that much of the work that had been done by syntactic transformations is better done in the lexicon. For example, they claim that transformations such as passive, causativization, and dative shift are better captured by lexical rules (Freidin 1974; Bresnan 1978; Mchombo 1978; Foley & Van Valin 1984; Marantz 1984; Pollard & Sag 1987, 1994).<sup>17</sup>

One proposed motivation for adopting a lexical approach to alternations is that many alternations seem to be sensitive to lexical items, particularly verbs. The notion of lexically governed rules goes back to Lakoff (1965), who recognized that no alternation seems to be exceptionless, and that the verb involved largely determines whether a given alternation applies or not. He states: "In some sense the verb 'governs' the passive transformation: it is central to the operation of the rule . . . . There are a number of other clear cases where it is obvious which item it is that governs the rules. Most of these involve verbs" (p. 28). However, in a passage immediately following this suggestion of a notion of government, Lakoff candidly recognizes: "Government . . . is not yet a completely well-defined notion, and we can offer no proposal for an adequate definition of it." In point of fact, the verb alone often cannot be used to determine whether a given construction is acceptable. Consider the following examples:

- (30) a. Sam carefully broke the eggs into the bowl.
- b. \*Sam unintentionally broke the eggs onto the floor. (cf. section 7.5.1)
- (31) a. This room was slept in by George Washington.
- b.?\*This room was slept in by Mary. (Rice 1987b)

- (32) a. Joe cleared Sam a place on the floor.  
 b. \*Joe cleared Sam the floor. (Langacker 1991)

Holding the verb constant, the (a)-sentences are better than the corresponding (b)-sentences. There is no natural way to capture these types of constraints in the lexical semantics of the main verb. On a constructional account, however, it is possible to associate constraints on the complements or on the overall interpretation of the expression directly with the construction. For example, Rice (1987b) argues that prepositional passives such as those in (31) are more felicitous when the surface subject argument is construed as affected. Similarly, the problem with example (32b) can be seen to be that the ditransitive construction implies that the argument designated by the first object comes to receive the argument designated by the second object. In this case Joe doesn't "receive" the floor, whereas in (32a) he does "receive" a place on the floor.<sup>18</sup>

A second motivation often cited for a lexical account stems from the fact that the lexicon is viewed as the receptacle of all idiosyncratic information. Therefore the existence of idiosyncratic properties is taken as evidence for a lexical phenomenon (Jackendoff 1975; Wasow 1977; Dowty 1979). However, if the lexicon is defined as the warehouse of idiosyncratic information, it must contain information about particular grammatical constructions that are phrasal and even clausal. For example, each of the following is idiomatic in the sense that some aspect of its form and/or meaning is not strictly predictable given knowledge of the rest of grammar.

- (33) a. Why paint your house purple? (Gordon & Lakoff 1971)  
 b. The more you stare at it, the less you understand. (Cf. Fillmore, Kay & O'Connor 1988)  
 c. He cried himself to sleep. (Cf. chapter 8)

Therefore evidence that a phenomenon is idiosyncratic is not evidence that it is *lexical*, unless "lexical" is defined so as to describe all and only idiosyncratic items. But once the definition of "lexical" is extended to this degree, the inevitable consequence is that the lexical is no longer neatly delimited from the syntactic (cf. DiSciullo & Williams 1987).

A third motivation is that crosslinguistically, many alternations are accompanied by morphological marking on the verb. For example, applicatives, causatives, and passives crosslinguistically tend to involve overt morphology on the verb stem. The morphological markers are taken to be evidence for a lexical rule that changes the inherent subcategorization (or semantic representation) of the verb stem. However, the approach suggested here can account for these cases without appealing to any type of lexical rule. On the present account, the closed-class grammatical morpheme is analogous to the English skeletal con-

struction; the verb stem plays the role of the main verb. The semantic integration of morpheme and verb stem is analogous to the integration of construction and verb in English. Since morphemes *are* constructions, and since no strict division is drawn between the lexicon and the rest of grammar, the analogy is quite strong. In fact, Emanatian (1990) has proposed an account along these lines for the Chagga applicative morpheme, as has Maldonado Soto (1992) for the Spanish reflexive morpheme *se*.

A final motivation is that "output" verbs undergo word formation processes, which are generally supposed (since Chomsky 1970, Aronoff 1976) to be a result of lexical rules. Because lexical rules and syntactic rules are taken to be independent, and because lexical rules are assumed to be ordered before syntactic rules, evidence that a rule *R* feeds a lexical rule is taken as evidence that *R* is a lexical rule. For example, Bresnan (1982) argues that passive must be a lexical rule since the output of passive is the input to a lexical "conversion" rule of adjective formation. The conversion rule takes passive participles and changes them into adjectives, which are then available as adjectival passives; this accounts for the identity of form between verbal and adjectival passives. Given the lexical nature of the conversion rule, Bresnan concludes: "Since it is assumed that the rule systems of natural language are decomposed into components of lexical rules [and] syntactic rules, . . . which are subject to autonomous sets of constraints, this constitutes the strongest possible kind of evidence that Passivization is a lexical rule" (p. 16). However, there is reason to think that the partition between lexical rules and syntactic rules is not so clearcut (cf. Stowell 1981; Sproat 1985; le Roux 1988; Ward, Sproat & McKoon 1991). Even if we do assume that it is possible to neatly divide grammar into separate components, the lexical and the syntactic—an assumption that Construction Grammar explicitly rejects—it is further necessary to assume that these modules must interact serially, and that syntactic phrases can never feed word formation rules, in order for the type of argument given above to be persuasive. But there are in fact cases of phrasal forms that appear to serve as input to word formation processes. Lieber (1988), for example, argues that the following examples involve phrasal forms which act as the input to lexical compound formation: *a punch-in-the-stomach effect*, *a God-is-dead theology*, *a thinking-about-it wink*, *a connect-the-dots puzzle*, *a win-a-Mazda competition*, and *a stick-it-in-your-ear attitude* (pp. 204–205).

Thus traditional motivations for accounting for variable syntactic expression in terms of lexical rules are ultimately not persuasive reasons to reject a constructional approach. In the following chapters, such an approach is outlined in more detail.

## 2 The Interaction between Verbs and Constructions

The constructional approach to argument structure brings several tricky questions to the fore. If basic sentence types are viewed as argument structure constructions, and we wish to claim that essentially the same verb is involved in more than one argument structure construction, we need to deal with the following questions:

1. What is the nature of verb meaning?
2. What is the nature of constructional meaning?
3. When can a given verb occur in a given construction?

Although I have argued that constructions have meaning independently of verbs, it is clearly not the case that the grammar works entirely top-down, with constructions simply imposing their meaning on unsuspecting verbs. In point of fact, there are reasons to think that the analysis must be both top-down and bottom-up. As will be discussed more fully below, the meanings of constructions and verbs interact in nontrivial ways, and therefore some cross-reference between verbs and argument structures will be necessary.

It might be worthwhile to note that the general idea of invoking two simultaneous mechanisms has been recently challenged by Baker (1987), who argues simply that involving two separate mechanisms as opposed to a single mechanism should make learning more difficult—because some mediation between the two mechanisms would be necessary—and should therefore be dispreferred as a psychologically plausible account.

This view, although having some degree of intuitive appeal, has been shown to be false in other domains of cognitive processing. The clearest evidence comes from the domain of vision. For example, it is well known that the perception of depth does not follow from a single principle but from the integration of information of many kinds. Perhaps the most important mechanism is *stereopsis*, the fusing of the two disparate images from the two retinas into a single image. However, stereopsis alone is not the only mechanism by which we determine depth (as can be demonstrated clearly by closing one eye: the perception of depth remains for the most part intact). Other cues include occlusion and differences in gradients of texture (Gibson 1950).

Another example that demonstrates the need for simultaneous mechanisms, and in particular, both top-down and bottom-up processing, comes from letter recognition tasks. Wheeler (1970) and others have shown that letters are more

quickly recognized in the context of a word than in isolation. This indicates that the recognition of the word (top-down processing) aids the recognition of the letters that make it up. At the same time, recognition of individual letters (bottom-up processing) is a prerequisite to recognition of the word. Recent connectionist models have had success in trying to model this type of interactive mechanism (McClelland, Rumelhart & Hinton 1986).

These counterexamples to Baker's argument from the domain of human vision and from word recognition tasks should make it clear that the type of interactive system that is being proposed here has ample precedent and should not be dispreferred on unempirical claims of what is "simpler." However, before we can move on to discuss the meanings associated with constructions and verbs, it is necessary to describe the type of semantics that will be adopted.

## 2.1 Frame Semantics

*Meanings are relativized to scenes.*

Charles Fillmore (1977a)

Many researchers have argued that words are not exhaustively decomposable into atomic primitives (e.g., Fodor, Fodor & Garrett 1975; Fodor et al. 1980). However, it is not necessary to conclude that meanings have no internal structure. Instead, it has been argued that meanings are typically defined relative to some particular background *frame* or *scene*, which itself may be highly structured. I use these terms in the sense of Fillmore (1975, 1977b) to designate an idealization of a "coherent individuable perception, memory, experience, action, or object" (1977b:84).

The point is made in the following passage by Austin:

Take the sense in which I talk of a cricket bat and a cricket ball and a cricket umpire. The reason that all are called by the same name is perhaps that each has its part—its *own special* part—to play in the activity called cricketing: it is no good to say that cricket *simply* means "used in cricket": for we cannot explain what we mean by "cricket" *except* by explaining the special parts played in cricketing by the bat, ball, etc. (Austin 1940:73)

Consider the difference between *ceiling* and *roof*. The top of a single-story building is a *ceiling* if construed with respect to the interior of a building, but a *roof* if construed with respect to the exterior. Thus a central difference between the two terms is that their background frames are different.<sup>1</sup> Fillmore (1977b) compares *land* and *ground*. *Land* is used to denote solid ground as opposed to the sea, whereas *ground* also denotes solid ground but as opposed to air. These terms are distinguished, therefore, primarily on the basis of the frames in which they are defined.

Another Fillmorean example is *bachelor*, often defined simply as 'unmarried man'. Fillmore points out that *bachelor* is in fact defined relative to a background frame of cultural knowledge. For that reason, it is odd in many cases to ascribe the term *bachelor* to particular unmarried men. For example, is the Pope a bachelor? Is a gay man a bachelor? Is Tarzan? Is a hermit? Or a recently bar mitzvahed young man? In these cases, whether the term applies or not is unclear, because certain aspects of the background frame in which bachelorhood is defined are not present.

Sometimes the background frame is fairly simple, and yet the same crucial point can be made. Langacker (1987a) gives the example of *hypotenuse*, which can only be defined with reference to a right triangle, which in turn can only be understood by assuming a notion of hypotenuse. Such an example provides a simple case for which to explain the notion of *profiling* (Langacker 1987a, 1991). Differences in profiling correspond to differences in the prominence of substructures within a semantic frame, reflecting changes in our distribution of attention.

While both *hypotenuse* and *right triangle* are defined relative to the same background frame (or "base," according to Langacker's terminology), the meanings of the terms differ in that different aspects of the frame are profiled. The different terms can be characterized by the following Langacker-style representations:



Figure 2.1

Frames in the sense being used here date back to the "schemas" of Bartlett (1932) and have been reintroduced more recently by researchers in Artificial Intelligence including Minsky (1975) and Schank and Abelson (1977). Frames are intended to capture useful chunks of encyclopedic knowledge. Such frame-semantic knowledge has been implemented in FRL (Roberts & Goldstein 1977) and KRL (Bobrow & Winograd 1977) in terms of a hierarchy of data structures (or "frames"), each with a number of labeled slots (see Wilensky 1986 for discussion and critique of various actual implementations; see Gawron 1983 for an application of AI frames to lexical semantics).

Lakoff (1987) argues that certain concepts are defined in terms of a cluster

of distinct frames, or "idealized cognitive models." He gives the example of *mother*, which is defined via the following models:

- a. The birth model: the person who gives birth
- b. The genetic model: the female who contributes genetic material
- c. The nurturance model: the female who nurtures and raises a child
- d. The marital model: the wife of the father
- e. The genealogical model: the closest female ancestor

Lakoff argues that the concept *mother* normally involves a complex model in which all of the above basic models are combined. But he notes that oftentimes there is pressure to pick one of the models as criterial, the one that "really" defines the concept, and that which model is picked varies according to circumstance and individual choice:

I was adopted, and I don't know who my real mother is.

I am not a nurturant person, so I don't think I could ever be a real mother to any child.

My real mother died when I was an embryo.

I had a genetic mother who contributed the egg that was planted in the womb of my real mother (1987:75)

Lakoff goes on to analyze the concept of *mother* as representing a *radial* category: a category with a central subcategory (which in this case combines all of the above models) and noncentral extensions from that prototype (including *adoptive mother*, *birth mother*, *foster mother*, *surrogate mother*, etc.).

## 2.2 THE NATURE OF VERB MEANING

So far the discussion of frame semantics has centered around nominal examples, but the semantics of nouns and verbs cannot be argued to involve qualitatively different types of knowledge, since nouns are often extended for use as verbs (cf. Clark & Clark 1979). Verbs, as well as nouns, involve frame-semantic meanings; that is, their designation must include reference to a background frame rich with world and cultural knowledge.

It is typically difficult to capture frame-semantic knowledge in concise paraphrase, let alone in formal representation or in a static picture. Still, it is indisputable that speakers do have such knowledge, as a moment of introspection should make clear. Consider the following (oversimplified) definitions:

**renege**: to change one's mind after previously having made a promise or commitment to do something

**marry**: to engage in a ritualized ceremony with a partner, resulting in a change in legal status, with the assumed intention of engaging in conjugal relations and remaining with said partner until one of the two dies

**boycott:** to avoid buying goods and/or services from a company with the aim of expressing disapproval or causing the company to change one or more of its policies or to go out of business

**riot:** for three or more people, acting as a group, to engage in activities outside of cultural norms in an unruly and aggressive manner, often with the intention of effecting political consequences

Other examples of verbs requiring aspects of complex world knowledge are not difficult to come by. Consider the rich frame-semantic knowledge necessary to characterize the meanings of: *languish*, *lamine*, *saunter*, *divorce*, *avenge*, *promote*, *subpoena*. In order to capture the richness of these meanings, verbs must be able to refer to conceptual structure, broadly construed (cf. Fillmore 1975, 1977b; Lakoff 1977, 1987; Langacker 1987a; Jackendoff 1983, 1987, 1990a).<sup>2</sup>

The idea that lexical entries should make reference to world and cultural knowledge is not without challengers. While many current theorists using semantic decompositional structures, such as 'X CAUSES Y TO RECEIVE Z', 'X ACTS,' or 'X CAUSES Y TO MOVE Z', readily recognize that such paraphrases do not capture all of what is intuitively the verb's meaning (e.g., Lakoff 1965; Foley & Van Valin 1984; Levin 1985; Pinker 1989), they argue that such paraphrases are adequate for capturing the "syntactically relevant aspects of verb meaning." The syntactically relevant aspects of verb meaning are defined to be those aspects which are relevant for determining the syntactic expression of arguments via linking rules. Similar proposals have been made by researchers who claim that the theta role arrays associated with lexical entries constitute the only syntactically relevant aspects of verb meaning (e.g., Kiparsky 1987; Bresnan & Kanerva 1989).<sup>3</sup>

On the account proposed here, the semantic decompositional structures correspond to *constructional meanings*. Only in the limiting case do verbs have such skeletal meanings (e.g., *give*, *do*, *make*). Since the mapping between semantics and syntax is done via constructions, not via lexical entries, that there *should be* a class of "syntactically relevant aspects of verb meaning" follows from the existence of constructions, which are independently motivated (cf. chapter 1).

Moreover, by distinguishing verbal semantics from constructional semantics, we can predict an observation noted by Pinker as to the nature of "syntactically relevant aspects of verb meaning," or what is here claimed to be constructional meaning. Pinker (1989) observes that such syntactically relevant aspects of verb meaning resemble the meanings of closed-class elements. That is, Pinker notes that the semantic features that are used to predict overt syntactic structure (via linking rules) are the same types of semantic features that have

been shown to be associated with closed-class items, for instance motion, causation, contact, and change of state (Talmy 1978, 1983, 1985a; Bybee 1985).

On a constructional account Pinker's observation is predicted. What needs to be recognized is that what Pinker takes to be the "syntactically relevant" aspects of verbal meaning are aspects of constructional meaning. Constructions *are* closed-class elements, so they are predicted to have the semantics of closed-class elements.

A further reason to distinguish the semantics of argument structure constructions from the verbs which instantiate them, and to allow the verbs to be associated with rich frame-semantic meanings, is the need to account for novel uses of verbs in particular constructions. For example, consider the following expression,

- (1) Sam sneezed the napkin off the table.

In order to interpret (or generate) this expression, one needs to know that sneezing involves the forceful expulsion of air. This would not be captured by a skeletal decompositional lexical entry for sneeze such as, for example, 'X ACTS.'

It is also clear that richer aspects of verb meaning are required for aspects of linguistic theory other than predicting the syntactic expression of arguments. For example, frame semantics is needed in order to account for the distribution of adverbs and adjuncts, to account for the process of *preemption* (defined below), to allow for the possibility of meaningful interpretation and translation, and to predict correct inferences. Each of these motivations is discussed in turn.

The particulars of the manner designated by verbs are typically taken to be opaque to syntax (whereas whether the verb encodes a manner or not is taken to be part of the syntactically relevant aspects of verb meaning). For example, with respect to the verb *roll*, Pinker notes: "The idiosyncratic information about the topography of rolling is a black box as far as grammar is concerned, and we need not be concerned about decomposing it, whereas the information that there is a manner specified, or a manner and a path, is something that grammar cares about" (1989: 182).

While it may be true that the syntactic expression of arguments is not concerned with specific manners, such specifics are clearly relevant to other aspects of language. In order to account for the distribution of adverbs and adjuncts, reference to the nature of the manner designated by the verb is essential. For example, to predict the distribution of the adverb *slowly*, reference to particulars of manner is required:

- (2) a. Joe walked into the room slowly.  
b.??Joe careened into the room slowly.

That is, one must know that *careening* implies quick, uncontrolled motion; therefore (2b) is contradictory. Similarly, in order to predict the distinctions between the following examples, reference to the particulars of manner is essential:

- (3) a. Joe walked into the room with the help of a cane.  
 b. ?Joe marched into the room with the help of a cane.  
 c. ??Joe rolled into the room with the help of a cane.  
 d. \*Joe careened into the room with the help of cane.

Thus the question that is often asked is, what aspects of meaning are relevant for a particular highly circumscribed domain? It is pointed out here that if we wish to ultimately account for a wider domain of language than the syntactic expression of arguments, we will need to appeal to a much richer notion of semantic structure.

Another reason to include frame-semantic knowledge in lexical entries is in order to account for the phenomenon of *preemption*, or “blocking.” It is widely recognized that children readily stop using overgeneralized forms upon learning an irregular form with the same meaning. For example, children tend to overregularize *go* to *goed*; but once they realize that *went* is synonymous, they cease to produce *goed*. Thus, *went* is said to preempt *goed*. Similarly, speakers do not generalize the pattern exemplified by *teacher*, *fighter*, *listener*, *doer* to form *\*cooker*, because *cooker* is preempted by *cook*.

In order for preemption to occur, the hypothesized regular form and the irregular form must have identical semantics. We would not expect *flew* to preempt *soared*, because their meanings are not identical. But in order to determine that *soared* is in fact not synonymous with *flew*, the child must know what *soared* and *flew* mean. It is not enough to know that they are motion verbs with a manner component; the entirety of the frame-semantic knowledge associated with them must be recognized (their phonological dissimilarity is not enough to distinguish them conclusively, since *went* preempts *goed* despite phonetic dissimilarity).

It should also be immediately clear that in order to even have a hope of accounting for interpretation or translation, we need to make reference to frame-semantic knowledge associated with lexical entries. Interpretations that only involve the “syntactically relevant” aspects of verb meaning would leave us with severely underspecified interpretations. For example, consider the following (very) short story:

- (4) Hershel kissed Bolinda. Bolinda slapped Hershel. Hershel slunk away.

This story would be interpreted as:

- (5) Hershel ACTED ON Bolinda in an  $M_1$  manner. Bolinda ACTED ON Hershel in an  $M_2$  manner. Hershel MOVED in an  $M_1$  manner.

We might know that  $M_i \neq M_j$ , for all  $i \neq j$ , but clearly such an interpretation is missing an intolerable amount of information. Translation would be rendered impossible, since there would be no means by which to determine correspondence between words.

Finally, it should be obvious that general frame-semantic knowledge is required to account for correct inferences, as has been amply shown by Bartlett (1932), Minsky (1975), Schank and Abelson (1977), and Bobrow and Winograd (1977). To make the case specifically for verbs, contrast the following, for example:

- (6) a. Sally skipped over the crack in the ground. ( $\rightarrow$  she didn't touch the crack)  
 b. Sally crawled over the crack in the ground. ( $\rightarrow$  she did touch the crack)

This type of inference is required to determine the acceptability of the following:

- (7) a. Sally, playing a child's game, avoided touching the crack by skipping over it.  
 b.??Sally, playing a child's game, avoided touching the crack by crawling over it.

In order to know whether or not to infer that Sally made contact with the crack, one needs to know exactly what manner of motion is involved in skipping and crawling; the knowledge of the specific manners involved is part of our frame-semantic understanding of what these terms mean. It is not enough to know simply that these verbs encode *some* manner.

To summarize, rich frame-semantic knowledge associated with verbs is necessary for (1) felicitous use of adverbs and adjuncts, (2) interpretation and translation, (3) the process of preemption, or "blocking," and (4) making correct inferences. Unless we decree that the distribution of adverbs and adjuncts, preemption, interpretation, and inferences are not within the domain of grammar, lexical entries must have access to such knowledge.

## 2.3 THE NATURE OF CONSTRUCTIONAL MEANING

### 2.3.1 Polysemy

Constructions are typically associated with a family of closely related senses rather than a single, fixed abstract sense. Given the fact that no strict division between syntax and the lexicon is assumed, this polysemy is expected,

since morphological polysemy has been shown to be the norm in study after study (Wittgenstein 1953; Austin 1940; Bolinger 1968; Rosch 1973; Rosch et al. 1976; Fillmore 1976, 1982; Lakoff 1977, 1987; Haiman 1978; Brugman 1981, 1988; Lindner 1981; Sweetser 1990; Emanatian 1990). That is, since constructions are treated as the same basic data type as morphemes, that they should have polysemous senses like morphemes is expected. It is worth discussing a particular example of such constructional polysemy.

Ditransitive expressions in English typically imply that the agent argument acts to cause transfer of an object to a recipient. It is argued below that this case of actual successful transfer is the *basic sense* of the construction.

At the same time, it is widely recognized that many ditransitive expressions do not strictly imply that the patient argument is successfully transferred to the potential recipient. For example, a so-called “*for*-dative” expression such as *Chris baked Jan a cake* does not strictly imply that Jan actually received the cake. It may happen that Chris was mugged by cake thieves on the way over to Jan’s. In general, expressions involving verbs of creation (e.g., *bake, make, build, cook*) and verbs of obtaining (e.g., *get, grab, win, earn*) do not strictly imply that the agent causes the potential recipient to actually receive the patient argument. Transfer is rather a *ceteris paribus* implication. What is implied by *Chris baked Jan a cake* is that Chris baked a cake *with the intention* of giving the cake to Jan. In fact, many of the verb classes associated with the construction can be seen to give rise to slightly different interpretations.

Expressions involving verbs which imply that the agent undertakes an obligation (e.g., *promise, guarantee, owe*) also do not strictly imply transfer. For example, *Bill promised his son a car* does not imply that Bill actually gave his son a car, or even that Bill intended to give his son a car. Rather, transfer is implied by the “conditions of satisfaction” associated with the act denoted by the predicate (Searle 1983). A *satisfied* promise, for example, does imply that the “promise” receives whatever is promised.

Expressions involving verbs of future having (e.g., *bequeath, leave, refer, forward, allocate, allot, assign*) imply that the agent acts to cause the referent of the first object to receive the referent of the second object at some future point in time. This class differs from the last two classes in that no intention or obligation of future action on the part of the referent of the subject is implied; the agent’s role in the transfer is accomplished by the action referred to by the predicate.

Expressions involving verbs of permission (e.g., *permit, allow*) imply merely that the agent *enables* the transfer to occur, by not preventing it—not that the agent actually *causes* the transfer to occur. For example, *Joe allowed Billy a popsicle* implies only that Joe enabled Billy to have a popsicle or did

not prevent him from having one—not that Joe necessarily caused Billy to have a popsicle.

Expressions involving verbs of refusal (e.g., *refuse*, *deny*) express the negation of transfer, for example in *Joe refused Bob a raise in salary* and *His mother denied Billy a birthday cake*. Here transfer is relevant in that the possibility for successful transfer has arisen, but the agent is understood to refuse to act as the causer of it.

Because of these differences, the semantics involved can best be represented as a category of related meanings. That is, the ditransitive form is associated with a set of systematically related senses. Thus the ditransitive can be viewed as a case of *constructional polysemy*: the same form is paired with different but related senses. By accounting for these differences in terms of constructional polysemy, as opposed to positing a collection of lexical rules, for example, we can capture the relations between the different senses in a natural way. In particular, a polysemous analysis allows us to recognize the special status of the central sense of the construction.

The central sense of the ditransitive construction can be argued to be the sense involving successful transfer of an object to a recipient, with the referent of the subject agentively causing this transfer. There are several reasons to adopt this view. The central sense proposed here involves concrete rather than metaphorical or abstract (here: potential) transfer, and concrete meanings have been shown to be more basic both diachronically (Traugott 1988; Sweetser 1990) and synchronically (Lakoff & Johnson 1980). Further, this is the sense most metaphorical extensions (as described in chapter 6) are based on. For example, consider (8) and (9):

(8) Mary taught Bill French.

(9) Mary taught French to Bill.

(8) implies that Bill actually learned some French, that the metaphorical transfer was successful. This is in contrast to (9), in which no such implication is necessary. Similarly, compare (10) and (11):

(10) Mary showed her mother the photograph.

(11) Mary showed the photograph to her mother (but her nearsighted mother couldn't see it).

(10) implies that her mother actually saw the photograph, whereas for many speakers, no such implication is given in (11).

These facts can be accounted for once we recognize actual successful transfer as the central sense of the construction; we need only state that metaphorical extensions have as their source domain this central sense.<sup>4</sup> Finally, successful

transfer is argued to be the central sense because the other classes of meanings can be represented most economically as extensions from this sense.

At the same time, the various senses are not predictable and must be conventionally associated with the construction. For example, it is not predictable from knowing the rest of English that verbs of creation will be allowed in the ditransitive construction in the first place; moreover, it is not predictable that ditransitive expressions involving verbs of creation will imply intended transfer instead of actual transfer or general benefaction. Because of this, the various different possible senses need to be listed.

The suggestion here of allowing for a fairly specific central sense of the construction and postulating separate related senses which make reference to specific verb classes can be contrasted with the possibility of postulating a single abstract sense for the construction and allowing the verbs' semantics to fill out the meaning. Since the latter approach is attractive in being more simple, let me take time to demonstrate why such an abstractionist account fails to adequately account for the data.

Several researchers (e.g., Wierbicka, 1986; Paul Kay, personal communication; Frederike Van der Leek, personal communication) have suggested that there is a simple uniform meaning associated with the ditransitive, namely, that there is some kind of special effect on the first object. It is claimed that the nature of this effect is inferred pragmatically. This proposal is attractive in its elegance, but there are several facts weighing against it. For one, the ditransitive construction does not systematically imply any particular special effect on the first object referent that the corresponding prepositional passive does not imply. Many ditransitive expressions do not entail that the first object referent is affected at all. Moreover, there are pragmatically possible interpretations of "affected" which are not possible interpretations of ditransitive expressions.

To illustrate the first point: there is no noncircular reason to think that the first object is any more affected in the following (a)-cases than in the corresponding (b)-cases:

- (12) a. Chris baked Pat a cake.  
b. Chris baked a cake for Pat.
- (13) a. Chris promised Pat a car.  
b. Chris promised a car to Pat.
- (14) a. Chris kicked Pat the ball.  
b. Chris kicked the ball to Pat.

In fact, there is no obvious definition for "affected" which implies that Pat is necessarily affected in (15):

(15) Chris baked Pat a cake.

Pat may never receive the cake, and in fact may never even know about it.

In addition, it is not possible to construe the first object as affected in just any pragmatically inferable way. For example, even if we know that there are an agent, a patient, and a goal involved (using the definitions of the thematic roles on, e.g., Kay's account), it is possible to pragmatically infer that the way the goal is affected is by the agent throwing the patient at the goal. However, the following cannot be interpreted this way:

(16) Pat threw Chris the ball.

(17) Pat hit Chris the ball.

That is, these examples cannot be interpreted to mean that Pat threw or hit the ball *at* Chris. They can only mean that Pat threw or hit the ball so that Chris would *receive* it—in this case, so that Chris would catch the ball. Consequently, we cannot felicitously say:

(18) #In an attempt to injure Chris, Pat threw Chris the ball.

This fact is unexplained by the abstractionist "affectedness" account.

Another abstractionist analysis that has been offered (Goldsmith 1980) is that the thematic role of the first object be described as *prospective possessor*, thus allowing the semantics to be abstract enough to cover all of the possible interpretations of transfer—actual, intended, future, or refused. However, this suggestion as well, and in fact more generally, any abstractionist account, is subject to several criticisms.

One problem is that an abstractionist account cannot capture the intuition that the notion of transfer in general, and *giving* in particular, is basic to the construction, since by virtue of positing only a single very abstract sense, *all* instances instantiate the construction equally. *Give*, however, is the most prototypical ditransitive verb because its lexical semantics is identical with what is claimed here to be the construction's semantics. This intuition seems to be strong enough to be worth worrying about. In fact, I performed an informal experiment to gauge the strength of the intuition that *give* codes the most basic sense of the construction. I asked ten nonlinguists what the nonsense word *topamased* meant in the following sentence:

(19) She topamased him something.

A full six out of ten subjects responded that *topamased* meant "give." This fact cannot be attributed simply to effects of general word frequency because

there are several other words allowed in this construction that are more frequent than *give*. Thus, according to Carroll, Davies, and Richman's (1971) *Word Frequency Book*, which used a 5,000,000-word corpus, *give* occurred 3,366 times in that corpus, while *tell* occurred 3,715 times, *take* 4,089 times, *get* 5,700 times, and *make* 8,333 times. Of these other words, only *tell* was given as a response in my survey, and it was only given by one speaker. None of the other words were given. One might raise the objection that while *give* is not the most frequently occurring word overall, it is nonetheless the most frequently occurring word *in this construction*. However, the point of the experiment was exactly to test whether speakers were aware of the close relation between *give* and the ditransitive construction; the results seem to indicate that they are.

A related problem stems from the fact that not all ditransitive expressions are equally acceptable. There are certain benefactive ditransitives, to be described in section 6.3.4 in terms of a systematic metaphor, which are acceptable to varying degrees for different speakers. Examples of this type include (Green 1974):

- (20) Hit me a home run.
- (21) Crush me a mountain.
- (22) Rob me a bank.

These expressions are severely restricted in their use, as pointed out by Oehrle (1976). Oehrle observes that they are noticeably more felicitous as commands:

- (23) a. Hit me a home run.
- b. ?Alice hit me a home run.

And, they are more acceptable when the recipient is referred to by a pronoun. Contrast (23a) with (24):

- (24) ?Hit Sally a home run.

On the present account, we can understand these cases to be a limited extension of the basic sense; we do not need to put them on a par with other ditransitive examples, yet we can still treat them as related to the rest of the ditransitives. However, on an abstractionist account, we have to choose whether to include them as ditransitives or exclude them from the analysis. If we include them, we have no way to account for their marginal status and the special constraints they are subject to. If we exclude them, we fail to capture the obvious similarity they bear to other ditransitives, both in their syntax and in their semantics.

Another problem is that it is not predictable that verbs of creation will com-

bine with the ditransitive to imply intended, instead of actual or future transfer. For example, consider (25):

(25) Chris baked Mary a cake.

This sentence can only mean that Chris baked the cake with the intention of giving it to Mary. It cannot mean that Chris necessarily gave, or will give, the cake to Mary.

Finally, an abstractionist analysis does not readily allow us to account for the fact, mentioned previously, that metaphorical extensions are based on actual transfer, not potential or intended transfer (but cf. note 4 again). That is, if we only postulate an abstract constraint on the first object position, we have no natural way of accounting for the fact that the metaphorical extensions imply this first object to be an *actual* recipient, not a prospective recipient or goal. However, on our constructional polysemy account we can say that the metaphorical extensions have as their source domain the central sense of actual transfer.

These problems arise for any abstractionist account; therefore, any such account can be seen to be unsatisfactory. Instead, a polysemous semantics is warranted. The related senses of the ditransitive construction can then be diagrammed as in figure 2.2. Each of the links extruding from the central sense in this diagram can be motivated by showing that the same relation holds in other areas of the grammar. In fact, remarkably similar patterns of polysemy are shown to exist for the caused-motion construction discussed in chapters 3 and 7. The related senses involve a category of force-dynamically related types of causation as has been described by Talmy (1976, 1985b) and Jackendoff (1990a).

It might be tempting to think that by positing constructional polysemy, we are simply adding complexity to the construction which would otherwise be attributed to the verb. That is, it might be thought that while we avoid polysemy of lexical items by not postulating separate input and output senses of verbs that undergo lexical rules, we create polysemy of the construction instead.

However, that is emphatically not the case. The polysemy attributed to constructions is polysemy that exists independent of our decision as to how verb meanings should be represented, since it corresponds to polysemy across *outputs* of what is generally taken to be a single lexical rule on traditional accounts. For example, the ditransitive construction is typically captured by a single lexical rule which creates a new verb sense, 'X CAUSES Y to RECEIVE Z'. However, we have seen that ditransitive expressions do not necessarily imply 'X CAUSES Y to RECEIVE Z', but may merely imply 'X INTENDS to CAUSE Y to

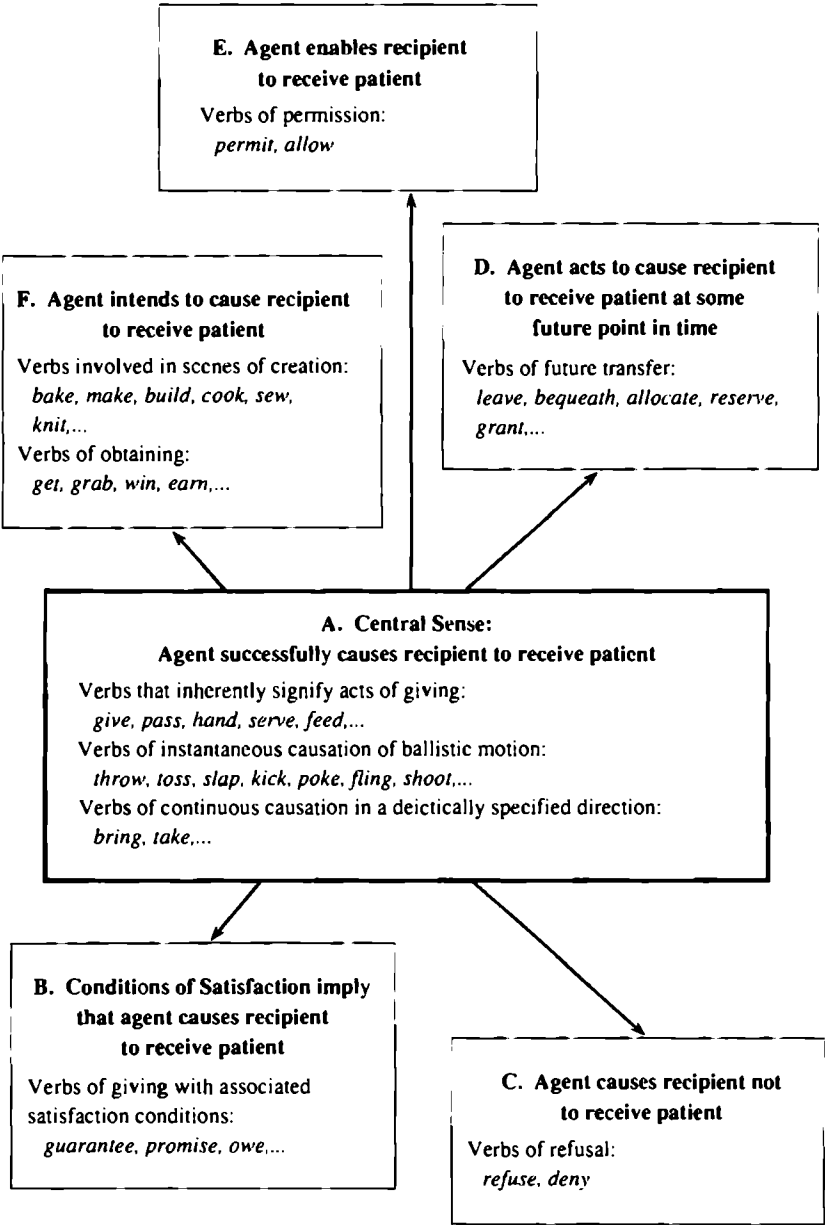


Figure 2.2

RECEIVE Z' (*leave, grant*); alternatively, it may be the case that only the conditions of satisfaction associated with the act designated by the verb imply 'X CAUSES Y TO RECEIVE Z' (*promise, owe*) or 'X CAUSES Y not to RECEIVE Z' (*deny, refuse*). Thus on a lexical rule account, a family of lexical rules, each with a slightly different output, would need to be postulated. We may conclude that irrespective of whether we posit distinct verb senses or whether we attribute the resulting semantics to an interaction of verb and construction, it is necessary to account somehow for the observed differences in the resulting semantics.

### 2.3.2 Humanly Relevant Scenes

In the previous section, it was argued that the English ditransitive construction has as its central sense "successful transfer"—someone causes someone to receive something. In fact, each of the basic clause-level constructions to be discussed can be seen to designate a humanly relevant scene, for example, something causing something to change location (the caused-motion construction), an instigator causing something to change state (the resultative construction), or an instigator moving despite difficulty (the *way* construction). Thus we can form the following hypothesis:

*Scene Encoding Hypothesis:* Constructions which correspond to basic sentence types encode as their central senses event types that are basic to human experience.

Languages are expected to draw on a finite set of possible event types, such as that of someone causing something, someone experiencing something, something moving, something being in a state, someone possessing something, something causing a change of state or location, something undergoing a change of state or location, someone experiencing something, and something having an effect on someone. These event types are quite abstract. We do not expect to find distinct basic sentence types which have as their basic senses semantics such as something turning a color, someone becoming upset, someone oversleeping.

The idea that constructions designate scenes essential to human experience is reminiscent of Fillmore's original motivation for the existence of a particular, fixed set of case roles: "The case notions comprise a set of universal, presumably innate, concepts which identify certain types of judgments human beings are capable of making about the events that are going on around them, judgments about such matters as who did it, who it happened to, and what got changed" (1968:24).

Particular combinations of roles which designate humanly relevant scenes are associated with argument structure constructions, which therefore serve to carve up the world into discretely classified event types. Verbs, on the other hand, are associated with richer frame-semantic meanings. As discussed in chapter 5, some cross-reference between verbs and constructions is also necessary, so verbs will in effect be annotated with information about which event types they can be associated with.

In this vein, Langacker (1991) argues that language is structured around certain *conceptual archetypes*: "Certain recurrent and sharply differentiated aspects of our experience emerge as archetypes, which we normally use to structure our conceptions insofar as possible. Since language is a means by which we describe our experience, it is natural that such archetypes should be seized upon as the prototypical values of basic linguistic constructs" (pp. 294–95). He goes on to suggest that these archetypes are extended in various ways for the following reason: "Extensions from the prototype occur . . . because of our proclivity for interpreting the new or less familiar with reference to what is already well established; and from the pressure of adapting a limited inventory of conventional units to the unending, ever-varying parade of situations requiring linguistic expression" (p. 295).

Support for the hypothesis that the central senses of argument structure constructions designate scenes which are semantically privileged in being basic to human experience comes from certain language acquisition facts. In particular, verbs that lexically designate the semantics associated with argument structure constructions are learned early and used most frequently (Clark 1978); certain grammatical markers are applied earliest to "prototypical" scenes—that is, scenes which are claimed to be associated with the central senses of constructions (Slobin 1985); and children's first utterances are about the particular scenes claimed to be associated with constructions (Bowerman 1989). Each of these pieces of evidence is discussed in turn.

Clark (1978) observes that "general purpose verbs" such as *go*, *put*, *make*, *do*, and *get* are often among the first verbs to be used. These verbs designate meanings that are remarkably similar to the meanings associated with argument structure constructions. For example, *go* has the meaning associated with the intransitive motion construction; *put* has semantics very close to that of the caused-motion construction; *make* has the semantics associated with the resultative construction. Possible constructions that are correlated with the meanings of the other high frequency verbs are not explicitly discussed here, but *do* could be said to correspond to the meaning associated with the basic sense of the simple intransitive and/or simple transitive construction. *Get* may well

code the semantics of yet another construction, that instantiated by verbs such as *receive*, *have*, *take*.

Clark cites other studies which have shown that words corresponding to these concepts are among the first to be used crosslinguistically as well (e.g., Bowerman 1973 for Finnish; Grégoire 1937 for French; Sanches 1978 for Japanese; and Park 1977 for Korean). Children appear to be using these verbs with a general meaning close to that of adults. Clark provides the following interpretations for children's early uses in her data:

*do*: "perform an action," generally occurring with an agent noun phrase and sometimes with an additional patient argument

*go*: "move," often accompanied by a locative phrase or particle

*make*: "construct," "produce," or "cause some state to come into being or be produced"

*put*: "cause to be or go in some place"

Not only are these general-purpose verbs learned early crosslinguistically, they are also the most commonly used verbs in children's speech. Clark cites the raw tabulations of verbs used by four children whose mean length of utterance was 2.5 words, collected by Bloom, Miller, and Hood (1975) and Bloom and Lahey (1978) from a fixed database. The data she presents are given in table 2.1. Clark concludes that "*go*, *put*, *get*, *do*, and *make* (plus *sit*) are far more frequent than any other verbs" (1978:48).<sup>5</sup> The fact that these "light verbs," which are drawn from a small set of semantic meanings crosslinguistically, are learned earliest and used most frequently is evidence that this small class of abstract meanings is cognitively privileged. These are the particular meanings directly associated with argument structure constructions.

Table 2.1  
Uses of first verbs in fixed data bases (Clark 1978)

| Action      | Tokens | Locative Action   | Tokens |
|-------------|--------|-------------------|--------|
| <i>get</i>  | 252    | <i>go</i>         | 417    |
| <i>do</i>   | 169    | <i>put</i>        | 287    |
| <i>make</i> | 132    | <i>sit</i>        | 129    |
| <i>read</i> | 86     | <i>fit</i>        | 65     |
| <i>play</i> | 85     | <i>take</i>       | 48     |
| <i>find</i> | 69     | <i>fall</i>       | 30     |
| <i>eat</i>  | 60     | <i>go bye-bye</i> | 28     |
| <i>fix</i>  | 59     | <i>away</i>       | 26     |
| <i>draw</i> | 52     | <i>come</i>       | 25     |
| <i>hold</i> | 50     | <i>get</i>        | 25     |

It has also been observed that children with Specific Language Impairment rely heavily on the same set of light verbs, including *go*, *get*, *do*, *put*, and *make*, in their production of sentences. For example, sentences such as *I'm doing two balloons* commonly replace the more appropriate *I'm using/playing with/bouncing two balloons* (Rice & Bode 1993; cf. also Watkins, Rice & Moltz 1993).

Slobin (1985) observes that children's first uses of certain grammatical markings are applied to "prototypical scenes": "In Basic Child Grammar, the first Scenes to receive grammatical marking are "prototypical," in that they regularly occur as part of frequent and salient activities and perceptions, and thereby become organizing points for later elaboration . . ." (p. 1175). He illustrates this claim by arguing that the grammatical marking of transitivity is first used to describe what he terms the "manipulative activity scene." This scene corresponds to the experiential gestalt of a basic causal event, in which an agent carries out a physical and perceptible change of state in a patient by means of direct manipulation. That is, markers of transitivity, both object markers in accusative languages and subject markers in ergative languages, are first applied to the arguments of verbs involving direct physical action, e.g., *give*, *grab*, *take*, *hit*, and not to those of verbs such as *say*, *see*, *call out*. In Kaluli (Schieffelin 1985) children do not overextend ergative inflection to the subjects of intransitive verbs, not even when these verbs have an active meaning, like *run*, *jump*; Slobin thus concludes that children are not grammaticizing the notion of actor in general, but are grammatically marking manipulative activity scenes.

While Slobin considers the acquisition of grammaticalized morphemes, his observations directly carry over to the lexically unfilled constructions in English which are studied here: the morphemes that mark transitivity in other languages correspond to the English skeletal transitive construction, although the latter has no overt morphological marking.

Bowerman (1989) observes more generally that the content of children's first utterances revolves around the general concepts claimed to be associated with constructions: "Regardless of the language being learned, children's first sentences revolve around a restricted set of meanings to do with agency, action, location, possession and the existence, recurrence, nonexistence, and disappearance of objects (Bloom 1970, Bowerman 1973, Brown 1973, Schlesinger 1971, Slobin 1970)" (p. 137). Thus we may conclude that data from language acquisition gives us some independent evidence for the claim that the events encoded by constructions are in some sense basic to human experience.

If it is correct that syntactic ("subcategorization") frames are associated directly with meanings, then what children learn when they learn the syntax of

simple sentences is the particular way certain basic scenarios of human experience are paired with forms in their language. That is, we assume that children have already mastered the concepts of transfer between an agent and a willing recipient, causation of motion or change of state, and so forth, and that they come to the task of learning language trying to learn how to encode these basic concepts. Constructions are then extended in various ways allowing the speaker to apply the familiar pattern to new contexts in principled ways, as we saw in the previous section. These patterns of extension are further discussed in the following chapters as well.

At the same time, it is not being claimed that *all* clause-level constructions encode scenes basic to human experience. Nonbasic clause-level constructions such as cleft constructions, question constructions, and topicalization constructions (and possibly passives) are primarily designed to provide an alternative information structure of the clause by allowing various arguments to be topicalized or focused. Thus children must also be sensitive to the *pragmatic information structure* of the clause (Halliday 1967) and must learn additional constructions which can encode the pragmatic information structure in accord with the message to be conveyed. These cases are not discussed further here (cf. Lambrecht 1987, 1994).

## 2.4 THE INTEGRATION OF VERB AND CONSTRUCTION

### 2.4.1 Participant Roles of Verbs

Part of a verb's frame semantics includes the delimitation of *participant roles*. Participant roles are to be distinguished from the roles associated with the construction, which will be called *argument roles*. The distinction is intended to capture the fact that verbs are associated with frame-specific roles, whereas constructions are associated with more general roles such as agent, patient, goal, which correspond roughly to Fillmore's early case roles or Gruber's thematic roles.<sup>6</sup> Participant roles are instances of the more general argument roles and capture specific selectional restrictions as well.

A useful heuristic for determining the basic meaning of a verb is to interpret the verb in gerundial form in the following frame:

No \_\_\_\_ing occurred.

The number and type of participant roles implicitly understood to be involved in the interpretation of this expression correspond to the number and type of participant roles in the frame semantics associated with the verb. For example:

- (26) a. No kicking occurred. (two-participant interpretation)  
 b. No sneezing occurred. (one-participant interpretation)

- c. No rumbling occurred. (one-participant [sound emission] interpretation)
- d. No hammering occurred. (one-participant [sound emission] or two-participant [impact] interpretation)
- e. No painting occurred. (two-participant interpretation—either creation or coloring interpretation)
- f. No giving occurred (three-participant interpretation)

In some cases, the verb cannot be used in this frame unless accompanied by certain complements:

- (27) a. \*No putting occurred.  
           No putting of cakes into the oven occurred.  
       b. \*No devouring occurred.  
           No devouring of cupcakes occurred.

In these cases, the necessarily expressed complements are taken to correspond to participants associated with the verb.<sup>7</sup>

Notice that several of the above examples have more than one interpretation, indicating more than one verb sense. We know from extensive studies of polysemy that lexical items are typically associated with a *set* of related meanings rather than a single abstract sense (Austin 1940; Wittgenstein 1953; Bolinger 1968; Rosch 1973; Rosch et al. 1976; Fillmore 1976, 1982; Lakoff 1977, 1987; Haiman 1978; Brugman 1981, 1988; Lindner 1981; Sweetser 1990). Therefore the existence of two, three, or more distinct but related verb senses is expected. These polysemous senses can be explicitly related by appealing to the frame semantics associated with each of them. What is avoided, though, is a system where a new sense is posited in an unrestrained way for each new syntactic configuration that is encountered.

### Lexical Profiling of Participants

As was the case with nouns, verbs lexically determine which aspects of their frame-semantic knowledge are obligatorily profiled. Lexically profiled roles are entities in the frame semantics associated with the verb that are obligatorily accessed and function as focal points within the scene, achieving a special degree of prominence (Langacker 1987a). These profiled participant roles correspond to those participants which are obligatorily brought into perspective, achieving a certain degree of “salience” (Fillmore 1977b). Profiling is lexically determined and highly conventionalized –it cannot be altered by context.

In some cases differences in profiling capture the primary difference between verbs. Fisher et al. (1991) appeal to a process that corresponds to profil-

ing to distinguish *take* and *give*. They note: "Movie directors make an art of distinguishing such notions visually. They can zoom in on the receiver's grateful mien, the giver out of focus, or off the frame completely. Using the word *take* rather than *give* is a linguistic way of making the same distinction" (1991: 8). Similar examples of verbs which seem to invoke the same semantic frame but differ in the participant roles profiled include *loan/borrow*, *buy/sell* (see Fillmore 1977b for discussion), and *substitute/replace* (see Landau & Gleitman 1985 for discussion).

The test for profiled status that will be used here is that profiled participant roles are those roles which are normally obligatorily expressed in finite clauses. The "normally"-caveat is intended to allow for two types of exceptions: cases where the verb occurs in a construction which serves the purpose of avoiding the overt expression of a particular argument, for example, a passive or middle construction, and (2) cases in which the profiled argument may be unexpressed under certain identifiable contextual circumstances. These two possibilities are discussed in section 2.4.5.

#### An Example: *Rob* vs. *Steal*

*Rob* and *steal* at first glance appear to be synonymous, despite their differing syntactic realizations:

- (28) a. Jesse robbed the rich (of all their money).  
b. \*Jesse robbed a million dollars (from the rich).\*
- (29) a. Jesse stole money (from the rich).  
b. \*Jesse stole the rich (of money).

However, the differences in the expressions of their arguments can be accounted for by a semantic difference in profiling. In the case of *rob*, the target and the thief are profiled, while in the case of *steal* the valuables and the thief are profiled. Representing profiled participant roles in **boldface**, we might express the difference between *rob* and *steal* thus:

*rob* <**thief** **target** goods>  
*steal* <**thief** target **goods**>

The different syntactic realizations of participant roles will be shown to follow from differences in profiling, since profiled participant roles must be fused with argument roles that are realized as direct grammatical functions (how this is done is discussed in section 2.4.2).

It might be objected that this putative semantic difference is only postulated to hide an idiosyncratic syntactic difference in the expression of participants. That is, it might be argued that we are only accounting for the fact that the

goods role of *steal* and the target role of *rob* must each be linked to OBJ. Indeed, if we needed to stipulate profiling differences as entirely idiosyncratic aspects of lexical entries in order to predict the syntactic expression of arguments, lexical profiling could not be considered a great advance over stipulating the syntactic expression of arguments directly. Either way we would have a stipulation, the only difference being that one stipulation would be semantic and the other syntactic. The differences between the two accounts could then be represented thus:

Syntactic Stipulation:

|                          |                      |
|--------------------------|----------------------|
| rob <thief target goods> | steal <target goods> |
|                          |                      |
| OBJ                      | OBJ                  |

Profiling Difference:

|                                  |                                    |
|----------------------------------|------------------------------------|
| rob < <b>thief target</b> goods> | steal < <b>thief</b> target goods> |
|----------------------------------|------------------------------------|

However, it can be demonstrated that *rob* and *steal* do in fact differ semantically, and that this difference allows us to predict a difference in profiling. *Rob* necessarily entails that the robbed person is seriously negatively affected: this is not true of *steal*. Notice the contrast between (30a) and (30b):

- (30) a. I stole a penny from him.  
 b. \*I robbed him of a penny.

If the victim is indeed negatively affected by the theft, however, use of *rob* becomes acceptable, as can be seen in the following sentence:

- (31) I robbed him of his last penny.

Similarly, (32a), in which a rather serious negative effect on the victim is implied, is acceptable, while (32b), in which the effect on the victim is not necessarily serious, is unacceptable:

- (32) a. I robbed him of his pride/his livelihood/his nationality.  
 b. \*I robbed him of his money/a lock of his hair.

*Steal*, on the other hand, does not require any effect on the victim.

- (33) I stole a penny/money/a lock of his hair from him.

*Steal* focuses on the fact that the stolen goods are not legitimately the thief's property, rather than the fact that they are actually someone else's. The victim is often left vague or unknown:

- (34) He stole jewels for a living.

Pinker (1989: 396) provides an example which exploits this semantic distinction between *rob* and *steal*:

- (35) "She could steal but she could not rob" (The Beatles, "She Came in through the Bathroom Window")

This line plays on the fact that *rob* profiles the victim while *steal* profiles the stolen goods. A person capable of stealing, but not robbing, is deemed relatively less criminal since stealing focuses on the stolen goods and not the victim.

An analogous difference exists between the nominal counterparts of these verbs, *robbery* and *theft* ("the act of stealing"). Robbery is a more serious offense than theft because it entails that the crime is committed *against* someone: the victim has to be present.<sup>9</sup> This is not true of theft. The difference is exemplified in the following:

- (36) They charged her with \*robbery/theft for shoplifting a jacket.  
 (37) With an Uzi, the disgruntled citizen committed many robberies/\*many thefts.

Figure 23 sums up graphically the differences in semantics between *steal* and *rob*.

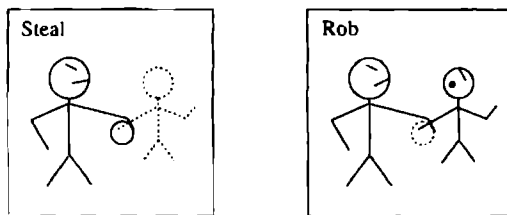


Figure 2.3

### A Deeper Explanation

I have claimed that the semantic differences between *rob* and *steal* are equivalent to a difference in profiling. A stronger statement would be to say that the primary distinction is in the verbs' semantic frames, and that this distinction underlies or motivates the difference in profiling. Thus it might be argued that the scenes associated with *rob* and *steal* are distinguished by more than a difference in profiling. One piece of evidence for this is the fact that the target role of *steal* is not required to be a person at all—only a source—as we might expect given its syntactic encoding.

(38) He stole money from the safe.

The same is not true of *rob*:

(39) \*He robbed the safe of its contents.

We might distinguish *rob* and *steal* by distinguishing their semantic frames, and thus their participant roles, as follows:

*rob* <**robber** **victim** goods>  
*steal* <**stealer** source **goods**>

Participant roles such as “victim,” which imply direct affectedness by the action denoted by the verb, are instances of the more general role “patient,” which is a prime candidate for profiled status across lexical items and across languages. “Source,” on the other hand, is rarely lexically profiled, although occasional examples with apparent lexical profiling do exist, as is the case of *depart*.<sup>10</sup>

There are certain generalizations about what types of participants are generally profiled. In particular, participants which are instances of the more general categories “agent” or “patient” tend to be the best candidates for profiled status. Citing Greenfield and Smith (1976), Clark (1978) suggests that agent- or patient-like entities are the most salient to children and are learned earliest: “Most of the object categories named in children’s early vocabularies are salient or attractive to them for various reasons: they move on their own, can move other objects, or can be manipulated by children. Notice that they name agents or movers—people and animals. . . . They also name a variety of smallish objects that are movable or can be manipulated. . . . In contrast, children hardly ever name places, instruments or goals” (1978:35). Fillmore (1977b) also discusses various attributes which tend to cause a participant to be “brought into perspective.” Unfortunately a full exploration of the question of which participants tend to be profiled would take us too far afield of the present work, and I do not attempt it here.

## 2.4.2 Representing the Meaning of Constructions

### The Constructional Profiling of Argument Roles

Phrasal constructions, as well as lexical items, specify which roles are profiled. Constructional profiling occurs as follows:

Every argument role linked to a direct grammatical relation (SUBJ, OBJ, or OBJ<sub>2</sub>)<sup>11</sup> is constructionally profiled.

The definition of constructional profiling embodies the claim that direct grammatical relations serve to distinguish certain arguments semantically and/or pragmatically; that is, direct grammatical functions profile particular roles as being either semantically salient or as having some kind of discourse prominence, for instance, being particularly topical or focused (see Keenan 1976, 1984; Comrie 1984; Fillmore 1977b; Langacker 1987a, 1991 for arguments to this effect). These grammatical relations are distinguished in most theories as the set of functions which are "terms," or which correspond to "core," "nuclear," or "direct" arguments. Like profiled participant roles, profiled argument roles will be indicated by **boldface**.

It is important to note that the profiling of participant roles discussed above and the profiling of argument roles are not of the exact same kind. The criterion for determining which of a verb's participant roles are profiled is that all and only obligatorily expressed participant roles are profiled. The test for which of a construction's argument roles are profiled is different. In the case of argument roles, all and only roles which are expressed as direct grammatical relations are considered profiled.

Thus the ditransitive construction is associated with the semantics 'X CAUSE Y to RECEIVE Z', which will be represented as

#### CAUSE-RECEIVE <agt rec pat>

The semantics of the construction is expressed in terms of a list of roles simply because this facilitates the statement of the relation between constructional roles and participant roles. However, it should be recognized that neither the constructional roles nor the participant roles constitute an unstructured list of atomic elements. Rather, roles are semantically constrained relational slots in the dynamic scene associated with the construction or the verb (cf. Jackendoff 1983, 1987, 1990a; Foley & Van Valin 1984; Rappaport & Levin 1988; Pinker 1989; Gropen et al. 1991; and Fillmore & Kay 1993 for arguments that roles are not primitives, but are derived from richer semantic structures). Therefore the particular labels that are used to identify these roles have no theoretical significance.

Constructions must specify in which ways verbs will combine with them; they need to be able to constrain the class of verbs that can be integrated with them in various ways (to be discussed in following chapters), and they must also specify the way in which the event type designated by the verb is integrated into the event type designated by the construction. These "principles of integration" between verbs and constructions warrant some discussion.

## The Fusion of Participant Roles and Argument Roles

If a verb is a member of a verb class that is conventionally associated with a construction, then the participant roles of the verb may be semantically *fused* with argument roles of the argument structure construction. The term “fusion” is borrowed from Jackendoff (1990a), who uses it to designate the combining of semantic constraints on distinct but coindexed slots within a given lexical entry. I am using the term somewhat differently here, insofar as fusion is meant here to capture the simultaneous semantic constraints on the participant roles associated with the verb and the argument roles of the construction, as opposed to denoting fusion of slots within a single lexical entry. In addition, the possibility of roles fusing is not determined by whether a single role filler can simultaneously fill both roles, but rather by whether the roles themselves are of compatible types.

Which participant roles are fused with which argument roles is determined by two principles:

1. *The Semantic Coherence Principle*: Only roles which are semantically compatible can be fused. Two roles  $r_1$  and  $r_2$  are semantically compatible if either  $r_1$  can be construed as an instance of  $r_2$ , or  $r_1$  can be construed as an instance of  $r_1$ . For example, the kicker participant of the *kick* frame may be fused with the agent role of the ditransitive construction because the kicker role can be construed as an instance of the agent role. Whether a role can be construed as an instance of another role is determined by general categorization principles.

2. *The Correspondence Principle*: Each participant role that is lexically profiled and expressed must be fused with a profiled argument role of the construction.<sup>12</sup> If a verb has three profiled participant roles, then one of them may be fused with a nonprofiled argument role of a construction.<sup>13</sup> For example, the ditransitive construction can be represented as:

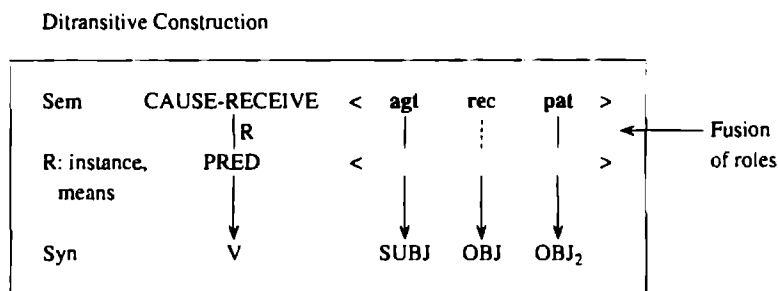


Figure 2.4

The semantics associated directly with the construction is 'CAUSE-RECEIVE <agt pat rec>'. PRED is a variable that is filled by the verb when a particular verb is integrated into the construction. The construction specifies which roles of the construction are obligatorily fused with roles of the verb; these are indicated by a solid line between the argument roles and the verb's participant role array. Roles which are not obligatorily fused with roles of the verb—that is, roles which can be contributed by the construction—are indicated by a dashed line. The construction also specifies the way in which the verb is integrated into the construction—what type of relation R can be (see section 2.5 for discussion). Sometimes a specific relation, e.g., means or instances, replaces R in the diagrams below.

Figure 2.4 shows a pairing between a semantic level and a syntactic level of grammatical functions. There is more to say about this linking pattern (cf. chapter 4), but for the moment it is simply stated as a brute force stipulation.

The typical case is one in which the participant roles associated with the verb can be put in a one-to-one correspondence with the argument roles associated with the construction. In this case, the constructional meaning is entirely redundant with the verb's meaning and the verb merely adds information to the event designated by the construction. For example, the verb *hand* is associated with three profiled participants: **handler**, **handee**, **handed**. The particular labels of these roles are of no theoretical significance; they are only intended to identify particular participants in the verb's frame semantics.

The three profiled participants of *hand* can be put in a one-to-one correspondence with the profiled argument roles of the ditransitive construction:

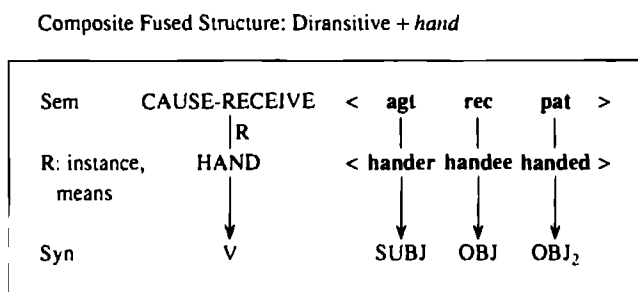


Figure 2.5

The composite structure corresponds to what is traditionally taken to be an additional or derived lexical meaning of the main verb. On the present account, however, the composite structure is just that, a composite structure. Allowing for the constraints specified by individual constructions (which are dis-

cussed in some detail in chapters 6–9), new composite structures can be freely constructed.

### 2.4.3 Mismatches of Roles Profiling Mismatches

The caused-motion construction is instantiated by expressions such as (40):

(40) Joe squeezed the rubber ball inside the jar.

It can be represented as follows:

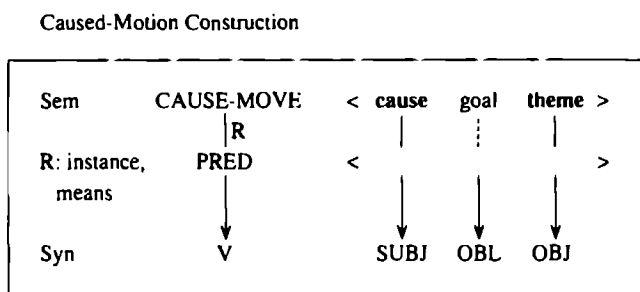


Figure 2.6

Explicit arguments that a construction is required for this case are given in chapter 7.

The participant roles of *put* are fused with the argument roles of the caused-motion construction as follows:

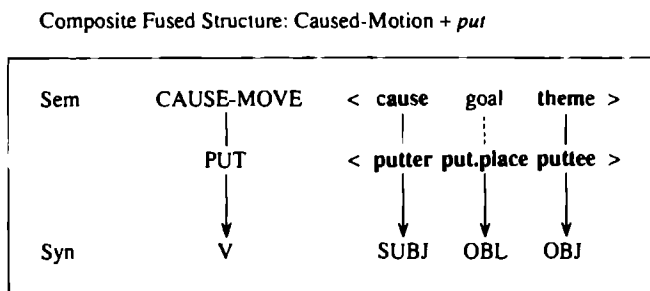


Figure 2.7

In this case, the caused-motion construction's cause argument fuses with the "putter" role of *put*, since a putter is a type of cause. The theme argument fuses with the "puttee," or put-thing, role of *put*, since the roles of theme and

put-thing are compatible. The goal (or perhaps more generally, location) argument fuses with the "put.place" role because the "put.place" role is a type of goal.

The goal argument role of the caused-motion construction is not profiled (we can tell because it is linked to an oblique function), although the "put.to" role is (we can tell because it's obligatory). The Correspondence Principle allows for one participant role to be linked to a nonprofiled argument role in cases in which the verb lexically profiles three participant roles. This allows the profiled participant role "put.to" to be fused with the nonprofiled argument role "goal."

The integration of *mail* and the ditransitive construction is an opposite case. *Mail* has three participant roles, two of which are lexically profiled:

send <**maller mailed** mailee>

Thus *mail* differs from *hand* in that only two of its participant roles are obligatory:

- (41) a. Paul mailed a letter.  
b. \*Paul handed a letter.

When *mail* integrated with the ditransitive construction, the construction imposes a profiled status on the "sendee" role:

Composite Fused Structure: Ditransitive + *mail*:

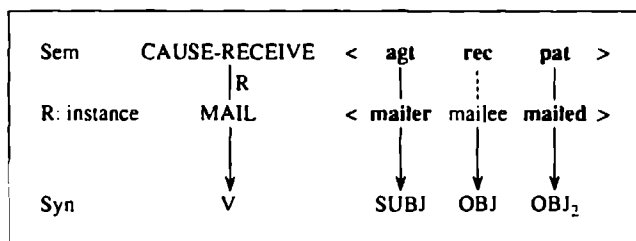


Figure 2.8

In general, if a verb's participant role is fused with a profiled argument role, the participant role inherits the profiled status.

### Mismatches in the Number of Roles

Notice that the Correspondence Principle is stated only in one direction: The profiled participant roles must be fused with profiled argument roles (except in the case of three profiled participant roles); that is, all profiled participant roles must be accounted for by the construction. However, it is not

necessary that each argument role of the construction correspond to a participant of the verb. As is argued in more detail in chapters 7–9, the construction can add roles not contributed by the verb.

For example, the participants of *kick* are kicker and kicked, and the arguments of the ditransitive construction are agent, patient, recipient. The ditransitive construction therefore contributes a recipient role not associated with a participant role of the verb. The roles are fused as follows:

Composite Structure: Ditransitive + *kick*:

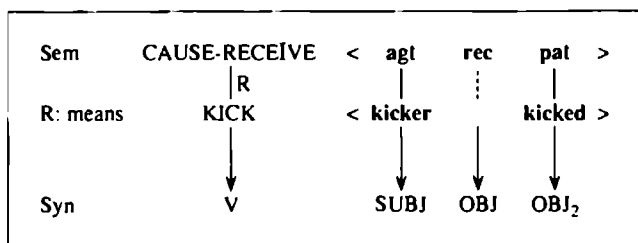


Figure 2.9

The participant roles cannot fuse with the argument roles in any other way because of the Semantic Coherence Principle. The kicker role can only fuse with the agent role, because the agent role is the only role it is semantically compatible with. A kicker is neither a type of recipient nor a patient. The kicked role is an instance of the patient role but not an instance of the recipient role.<sup>14</sup> Crucially, the recipient role is contributed by the construction. This structure yields sentences like (42):

(42) Joe kicked Bill the ball.

Other cases we have seen work similarly. *Sneeze*, for example, has a single profiled participant role, a sneezer. It integrates with the caused-motion construction as follows:

Composite Structure: Caused-Motion + *sneeze*:

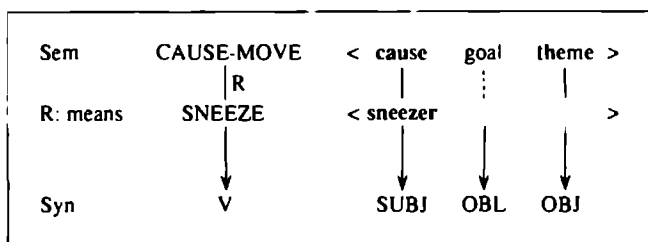


Figure 2.10

The composite fused structure licenses expressions such as (43):

(43) He sneezed the napkin off the table.

Other cases in which constructions contribute roles which do not correspond to participant roles associated directly to the verbs include constructions and verbs exemplified by the following:

(44) "My father *frowned* away the compliment and the insult." (Stephen McCauley, *Easy Way Out*, 1993)

(45) "Sharon was exactly the sort of person who'd *intimidate* him into a panic." (Stephen McCauley, *Easy Way Out*, 1993)

(46) "I cannot inhabit his mind nor even *imagine* my way through the dark labyrinth of its distortion." (Oxford University Press corpus)

(47) Pauline *smiled* her thanks. (Levin & Rapoport 1988)

(48) The truck *rumbled* down the street. (Levin & Rapoport 1990b)

#### Other Kinds of Mismatches

In all the cases considered so far, the participant roles have been independently classifiable as instances of more general argument roles. However, in other cases, this is not so. For example, consider the verb *send* when integrated into the ditransitive construction. It is assumed that the same sense of *send* is involved in both (49) and (50):

(49) Joe sent Chicago a letter.

(50) Joe sent a letter to Chicago.

The difference in semantics, namely that in (49) Chicago is necessarily construed as standing metonymically for certain people in Chicago, is attributed to an effect of the ditransitive construction, since the construction imposes the constraint that the "send.goal" role must be a recipient, and therefore animate.

The integration of *send* into the ditransitive construction is represented below:

Composite Fused Structure: Ditransitive + *send*:

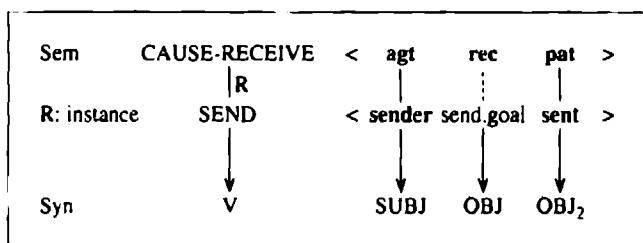


Figure 2.11

Recall that the Semantic Coherence Principle was stated as follows: two roles are semantically compatible iff one role can be construed as an instance of the other. The send goal role can be *construed* as a type of recipient even though it is not necessarily a recipient in and of itself.

### Distinct Verb Senses

Occasionally verbs have distinct senses which are systematically related by a difference as to which participant roles are profiled. For example, *lease* and *rent* can occur with either the tenant or the landlord profiled, in addition to the property being profiled:

- (51) a. Cecile leased the apartment from Ernest. (**tenant, property**)
- b. Ernest leased the apartment to Cecile. (**landlord, property**)
- (52) a. Cecile rented the apartment from Ernest. (**tenant, property**)
- b. Ernest rented the apartment to Cecile. (**landlord, property**)

It might be tempting to think that we could analyze these cases along the lines of the other cases discussed above: we could try to underspecify the meaning of the verb and allow the particular constructions to impose a profiled status on particular roles. In particular, we might try to postulate a single sense of *lease* with the property role as the only lexically profiled participant role. However, our test for profiled participant roles is that all and only roles which are obligatorily expressed in finite sentences are profiled. Given this test, it is not possible to simply say that *lease* only has one profiled role, the property, because the verb cannot occur with only the property role:

- (53) \*The property leased.

Therefore, to account for these cases, we posit two distinct senses of the verb:

lease<sub>1</sub> <**tenant property** landlord>  
 lease<sub>2</sub> <tenant **property landlord**>

Although I have generally tried to avoid positing additional verb senses to account for each possible syntactic pattern, I do not rule out the possibility that *some* alternations must be accounted for by postulating distinct but related verb senses. It should be borne in mind that what we have here is an instance of polysemy, not homonymy, because of the fact that the two senses share the same background semantic frame. They only differ in which roles are profiled.

#### 2.4.4 Unexpressed Profiled Participant Roles

The specific conditions under which a profiled participant role may fail to be expressed are: (1) the verb occurs in a construction which specifically

*shades, cuts, or merges* the role, or (2) the verb lexically specifies that the role may be unexpressed with a definite interpretation. These topics in themselves could be the subject of a monograph; I do not claim to do them justice here, but I will discuss them briefly in this section.

**Shading.** The term “shading” is intended to evoke the metaphor suggested by Fisher et al. (1991), that profiling is in some ways analogous to a movie camera focusing on certain participants. Shading denotes a process whereby a particular participant is “put in the shadows,” and thus no longer profiled. The passive construction serves to shade the highest ranked participant role associated with the verb. Shading might as well have been termed “deprofiling,” except that it is not necessary that the shaded participant is otherwise lexically profiled. Shading is analogous to the suppression of arguments in GB and LFG, although these theories do not make any claims about the semantic/pragmatic effects of passive. A *shaded* participant may be expressed by an adjunct. The statement of the passive requires reference to a thematic hierarchy, versions of which have been proposed, for example, by Fillmore (1968), Jackendoff (1972), Kiparsky (1987), and Grimshaw (1990). The following hierarchy is assumed:

agent, cause > recipient, experiencer > instrument > patient, theme >  
location, source, goal

The roles expressed by the hierarchy are argument roles, or role types in the sense of Dowty 1986. That is, they are more general than the verb-specific participant roles. Since participant roles are typically instances of one of these roles, the hierarchy serves to define a *partial ordering* of all roles. For example, the “hitter” role is higher on the hierarchy than the “hittee” role. But the fact that the ordering is partial means that not all roles are ordered with respect to each other. Passive applies only to verbs which are associated with two or more roles, one of which is higher than the others.

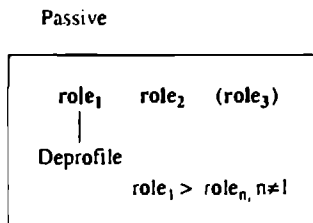


Figure 2.12

**Cutting.** The term “cutting” is intended to invoke the notion of a director cutting one of the participants out of the picture. Stative constructions in

Bantu (Mchombo 1992), impersonal passive constructions in German, and the middle construction in English serve to *cut* a profiled participant. The difference between a shaded participant role and a cut participant role is that the latter cannot be expressed. For example, the agent role is cut in the English middle construction:

(54) \*This bread cuts easily by Sarah.

**Role merging.** Reflexive constructions, for instance in Romance, serve to *merge* one participant role with another. The merged participant roles are fused with a single argument role, and are then linked with a single grammatical function.<sup>15</sup>

**Null complements.** Fillmore (1986) distinguishes two distinct ways in which verbs may lexically specify that a certain participant role can fail to be expressed. In the first type of case, the unexpressed role receives an indefinite interpretation; the referent's identity is either unknown or irrelevant. These are *indefinite null complements*. For example, the objects of *eat* and *drink* are not expressed in (53), and their referents' identities—that is, what was eaten or drunk—are irrelevant.<sup>16</sup>

(55) After the operation to clear her esophagus, Pat ate and drank all evening.

The unexpressed source role in the following is similar:

(56) Chris drove across the country.

While it is entailed that Chris drove from somewhere, the identity of the source need not be recoverable by either speaker or hearer; it is left indefinite. A similar case involving an unexpressed path argument is given in (57):

(57) She ran for two hours.

Since the unexpressed role in each of these examples has no special prominence and is nonsalient, these are clear cases of nonprofiled roles. That is, the food and drink participants of *eat* and *drink*, respectively, are participant roles but are not lexically profiled. The same is true of the source (and goal and path) roles of *drive* and *run*.

The second type of unexpressed complement discussed by Fillmore is different: the referent's identity in this case must be recoverable from context. This is the *definite null complement*. Examples of this type include the following (the square brackets are used to indicate where the absent role would normally be expressed):

- (58) a. Chris blamed **Pat** [   ].  
       b. Lee found out [   ].  
       c. Jo won [   ]!

Only in contexts in which both speaker and hearer can be expected to be able to recover the unexpressed arguments are these cases felicitous; it is in this sense that they are *definite* null complements. Since the contextual constraint ensures that the participant role in question is accessed and salient (in order to be identified), the definite null complement is considered profiled.

Fillmore provides a test to distinguish the two types of unexpressed roles. He notes that while it is perfectly acceptable for a speaker to admit ignorance of the identity of a missing indefinite argument, it sounds odd for a speaker to admit ignorance of a missing definite complement:

- (59) a. He found out! #I wonder what he found out. (definite null complement)  
       b. He was running. I wonder where he was running to. (indefinite null complement)

Fillmore observes that in English, whether a verb allows an argument to be unexpressed with a definite interpretation is a lexical specification. This assumption is necessary in order to account for distinctions of the following kind:<sup>17</sup>

- (60) (Why did you marry her?)  
       Because Mother insisted/\*required/\*demanded. (1986: 98)

Only *insist* allows a definite null complement; the closely related *require* and *demand* do not. At the same time, many other languages, including Japanese, Korean, and Hungarian, allow definite null arguments freely. In these languages, often only the verb is overtly expressed; all of the verb's participants may receive a definite interpretation in context. Below, profiled definite omisable participant roles will be represented by the role name in boldface surrounded by square brackets: [role].

To summarize, there are several ways in which profiled participant roles can be accounted for without being overtly expressed. The verb may occur in a construction which specifically shades, cuts, or merges a certain role or, in languages like English, the verb may lexically designate that a particular role may be unexpressed if it receives a definite interpretation.

## 2.5 POSSIBLE RELATIONS BETWEEN VERBS AND CONSTRUCTIONS

On a constructional approach to argument structure, in which the semantics of the verb classes and the semantics of the constructions are integrated to

yield the semantics of particular expressions, the question arises as to what range of verb classes can be associated with a given construction.

Could *any* verb class in principle be conventionally associated with a particular construction?<sup>18</sup> For example, if we accept that the ditransitive construction is directly associated with a particular semantics, roughly, 'X CAUSES Y to RECEIVE Z', then why would it not be possible in principle for, say verbs of mood like *sadden*, *anger*, *regret* to be used with the ditransitive construction as in (61) to imply the resulting emotional state?

(61) \*Joe angered Bob the pink slip.

("Joe gave Bob a pink slip, causing Bob to become angry.")

Obviously we want to rule out such a possibility.

In order to circumscribe the possible types of verb classes that can be associated with particular constructions, we need to examine more closely the types of relations that the verb's semantics may bear to the semantics of the construction.

Commonly, the event type designated by the verb is an instance of the more general event type designated by the construction. For example, consider the use of *hand* in (62):

(62) She handed him the ball.

*Hand* lexically designates a type of transfer event; at the same time, transfer is the semantics associated with the ditransitive construction. Another example of this kind is *put*, used as in (63):

(63) She put the phone on the desk.

*Put* lexically designates a type of caused-motion event, and caused motion is of course the semantics associated with the caused-motion construction.

Other systematic relations between verbs and constructional meanings have been discussed under the heading of "conflation patterns" (Talmy 1985a). In our terms, conflation patterns correspond to mismatches between the semantics of the verb and the semantics designated by the construction. The mismatches can be of several types.

As has been implicit in much of the generative semantics literature (e.g., Lakoff 1965; McCawley 1973) and has more recently been recognized by Talmy (1985), Levin and Rapoport (1988), and Jackendoff (1990a), verbs which do not directly denote the meaning associated with the construction often denote the *means* by which the action is performed. This is the relation that verbs of ballistic motion bear to the meaning of the ditransitive construction. For example, in (64) kicking is the means by which transfer is effected.

- (64) Joe kicked Bob the ball.  
 ("Joe caused Bob to receive the ball by kicking it.")

In the case of causative constructions, the verb designates the *result* associated with the construction. The construction supplies an agent argument which does not fuse with any of the participant roles associated with the verb. For example, consider the Chicheŵa causative morpheme *íts* in (65) (from Alsina & Mchombo 1990):

- (65) Nūngu i-na-phík-íts-a maūngu kwá kádzĩdzi.  
 9 porcupine 9s-ps-cook-CAUSE-fv 6 pumpkins to 1 owl.  
 'The porcupine had the pumpkins cooked by the owl.'

Alsina (1993) analyzes this morpheme as having the following semantic representation:

- (66) CAUSE <agt pat PRED <...>>

The causative morpheme is thus a construction, into which the verb's semantics (represented by PRED) integrates. This morphological construction is quite analogous semantically to the lexically unfilled English constructions that have been discussed so far. The verb stem and the causative morpheme must integrate, just as the English verb must integrate into the various English constructions.

### The Causal Relation Hypothesis

Croft (1991) proposes a general constraint on possible conflation patterns. He suggests that "individual lexical items appear to denote only causally linked events" (p. 160) (see also Matsumoto 1991 for discussion of the centrality of causality in this respect). To illustrate his point, Croft cites the following example adapted from Talmy (1985a):

- (67) The boat sailed into the cave.

He argues that the sailing manner and the implication of motion can only be conflated if the activity of sailing *causes* the motion. That is, the following is unacceptable:

- (68) \*The boat burned into the cave.

Example (68) cannot mean that the boat entered the cave while burning.<sup>19</sup>

Croft's claim can be restated in terms of the present account in the following way:

*Causal Relation Hypothesis:* The meaning designated by the verb and the meaning designated by the construction must be integrated via a (temporally contiguous) causal relationship.

Evidence supporting Croft's claim comes from the distribution of verbs of sound emission with constructions that designate motion. Such verbs can be used freely when the sound is a *result* of the motion and occurs simultaneously with the motion:

- (69) a. The wooden-legged man clumped into the room.  
 b. The train screeched into the station.  
 c. The fly buzzed out of the window.  
 d. The truck rumbled down the street. (Levin & Rappaport 1990b)  
 e. The elevator creaked up three flights.

For instance, the clumping noise of (69a) is a result of the man's moving. For most speakers verbs of sound emission cannot be used for coincidentally co-occurring (or characteristic) sounds, where no causal relationship is involved:

- (70) a. \*The bird chirped out of the cage.  
 b. \*The dog barked into the room.  
 c. \*The rooster crowed out of the barn.  
 d. \*The man laughed out of the room.

However, Croft's claim is not sufficient to account for all cases. This brings us to the following section.

### Violations of the Causal Relation Hypothesis

There are several types of violations of the Causal Relation Hypothesis that are allowed by particular constructions. The construction exemplified by (71) allows verbs which designate events not causally related, at least to a limited extent (cf. chapter 9).

- (71) She kicked her way out of the room.

For example, the following examples from the Oxford University Press corpus involve only the *manner* of motion, not the *means* of motion (cf. Levin & Rapoport 1988; Jackendoff 1990a):<sup>20</sup>

- (72) a. " 'I *knitted* my way across the Atlantic,' he reveals."  
 b. "... without a party to go to, he *nods* and *winks* his way through the set crammed with seaside sing-alongs."  
 c. "... [anyone] watching would have thought he was *scowling* his way along the fiction shelves in pursuit of a book."

Interestingly, the *way* construction tends to be used with pure manner verbs only when the manner is particularly salient and emphasized. This is reflected in the fact that, not uncommonly, manner cases involve two or three conjoined verbs, as in example (72b).

Returning to verbs of sound emission again, it seems that they can marginally be used in the motion construction when the verbs do not designate a sound resulting from the motion. In particular, if the sound is the means of identifying the path of motion, the expressions seem at least marginally acceptable:

- (73) a. ?The police car screamed down the street.  
b. ?The train whistled into the station.

The conative construction exemplified by (74) also permits exceptions to the Causal Relations Hypothesis:

- (74) a. Ethel struck at Fred.  
b. Ethel shot at Fred.

In this case the verb designates the *intended result* of the act denoted by the construction. The semantics of the construction can be represented roughly as 'X DIRECTS ACTION AT Y'. That is, Ethel does not necessarily strike Fred, but striking him is the intended result of the directed action. The construction can be represented as follows:

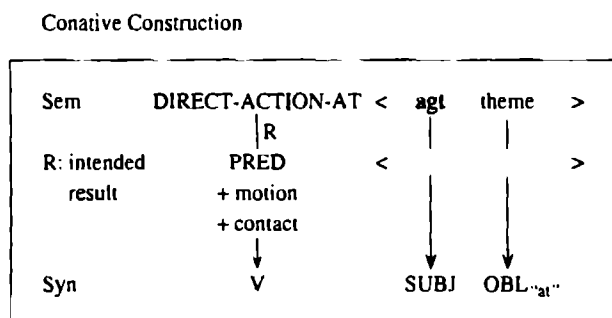


Figure 2.13

The fact that a verb that is related to the construction by the intended-result relation must be [+motion, +contact] serves to allow verbs such as *shoot*, *hit*, *kick*, and *cut*, while correctly ruling out verbs such as *\*move* (no contact) and *\*touch* (no motion) (Guerssel et al. 1985; Laughren 1988). This constraint is captured by restricting the class of verbs which can instantiate PRED when the R-relation is one of intended result.

This representation allows us to assimilate expressions such as (74a, b) above to other related expressions, for instance those in (75):

- (75) a. Fred looked at Ethel.  
b. Ethel aimed at Fred.

*Look* and *aim* are not [+motion, +contact] verbs,<sup>21</sup> and yet they bear an obvious similarity to the cases above. They differ from these earlier cases in that now the verb's semantics is an instance of the semantics of the construction. That is, 'look' and 'aim' are instances of 'DIRECT-ACTION-AT'. For example, *aim* fuses with the conative construction as follows:

Composite Structure: Conative + *aim*

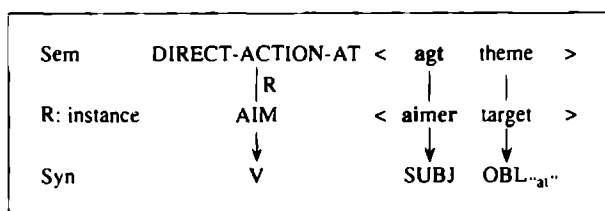


Figure 2.14

The meaning of the construction remains constant, regardless of whether the verb designates an instance or the caused result; it is the relation between the meaning of the verb and the meaning of the construction—the R-relation—which is different. Particular R-relations must be able to refer to classes of verbs in order to capture the [+motion, +contact] constraint. The conative construction can be represented as follows:

Conative Construction

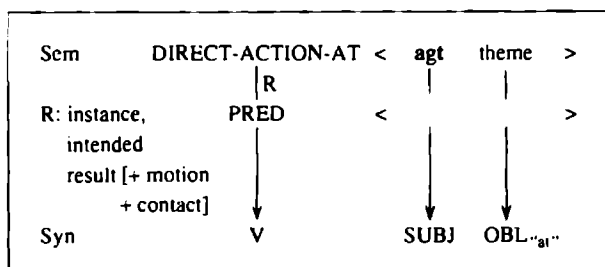


Figure 2.15

Verbs may also code particular *preconditions* associated with the semantics of the construction. For example, creation verbs designate an act of creation, which is a precondition for transfer. Consider (76):

(76) Sally baked Harry a cake.

This sentence does not entail that the baking itself was causally related to the transfer. The baking does not cause the transfer, and the transfer does not cause the baking. However, the creation of the cake is a necessary precondition of the transfer.

An important question is, why should these relations be privileged? Why should means, preconditions, and to a lesser extent, the manner involved in an event be more likely candidates for use in a construction which implies the entire event than, say, the mood of one of the participants?

This deeper question is difficult to answer, but if we consider certain verbs' inherent semantics to bear a *metonymic* relationship to the semantics of the construction, we may find a partial explanation. The semantics associated with the construction defines a semantic frame, and the verb must inherently designate a particular salient aspect of that frame.

### The Fusion of Roles

Matsumoto (1991) notes that when two verbs are combined to form a complex motion predicate in Japanese, they must share at least one role. He labels this constraint the Shared Participant Condition. In our terms, this constraint can be translated into the claim that at least one participant role and argument role must be fused; thus not all of the argument roles can be contributed by the construction.

### Summary of the Relations between Verb Semantics and Construction Semantics

Let  $e_c$  be the event type designated by the construction, and  $e_v$  the event type designated by the verb.

- I.  $e_v$  must be related to  $e_c$  in one of the following ways:
  - A.  $e_v$  may be a subtype of  $e_c$
  - B.  $e_v$  may designate the means of  $e_c$
  - C.  $e_v$  may designate the result of  $e_c$
  - D.  $e_v$  may designate a precondition of  $e_c$
  - E. To a very limited extent,  $e_v$  may designate the manner of  $e_c$ , the means of identifying  $e_c$ , or the intended result of  $e_c$
- II.  $e_c$  and  $e_v$  must share at least one participant (Matsumoto 1991).<sup>22</sup>

Do all of the possible relations in (I) have equal status? Clearly not. That  $e_v$  may be a subtype of  $e_c$  is prototypical and universal. The possibility that  $e_c$  may code the means of  $e_c$  seems to be a language-specific parameter: English, Dutch, and Chinese allow this relation; Romance, Semitic, and Polynesian languages apparently do not (Talmy 1985a). Other relations, for example that  $e_v$  may designate the precondition, manner, or result of  $e_c$ , are construction specific.

The result of integrating the verb with the construction must be an event type (E) that is itself construable as a single event. That is, only a single event can be expressed by a single clause. Some of the constraints on exactly what this entails are discussed in chapters 7 and 8.

## 2.6 CONCLUSION

In this chapter, I have attempted to argue for some of the basic claims underlying this monograph, and have laid out some of the machinery needed to make these claims precise. Following the discussion in chapter 1, where it was argued that constructional meaning exists independently of verb meaning, the type of semantics associated with verbs and constructions has been discussed in more detail.

Verbs and other lexical items have been argued to be associated with rich frame-semantic knowledge. Basic sentence-level constructions, or argument structure constructions, have been argued to designate scenes which are in some sense basic to human experience (cf. also Fillmore 1968, Langacker 1991). That is, it is claimed that the set of basic clause types of a language are used to encode general event types such as those denoting that someone did something to someone, something moved, someone caused something to change state, someone experienced something, someone possessed something, and so forth. Evidence for the idea that these event types have a privileged status comes from certain language acquisition facts noticed by Clark (1978), Slobin (1985), and Bowerman (1989).

In addition it has been argued that these basic senses are extended in various ways so that particular syntactic frames are associated with a family of related meanings. This idea has been explicitly contrasted with the idea that the semantics associated with a construction is ultimately generalized, or that it is abstracted to a single more general sense.

Finally, constraints on the types of potential relations between verbs and constructions have been suggested, extending observations by Talmy (1985a), Croft (1991), and Matsumoto (1991).