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Constructions: A Construction
Grammar Approach to Argument
Structure
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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.[1] 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:[2]

(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.[3]

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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.[4] 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_2 Pat faxed Bill the letter.
2. Caused Motion	X CAUSES Y to MOVE Z	Sub V Obj Obl Pat sneezed the napkin off the table.
3. Resultative	X CAUSES Y to BECOME Z	Subj V Obj Xcomp She kissed him unconscious.
4. Intrans. Motion	X MOVES Y	Subj V Obl The fly buzzed into the room.

5. Conative	X DIRECTS ACTION at Y	Subj V Obl_{at} Sam kicked at Bill.

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:[5]

> C is a CONSTRUCTION iff_{def} C is a form–meaning pair $<F_i, S_i>$ such that some aspect of F_i or some aspect of S_i 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.[6] 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).[7] 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 Di-Sciullo 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 *constructicon,* 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 interrelated 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.[8]

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.

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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$_1$', would constrain its goal to be animate, while the other, 'slide$_2$', 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$_1$' requires its goal to be animate, as follows:

'slide$_1$': <agt, pat, goal$_{animate}$> 'slide$_2$': <agt, pat, goal>
↓ Linking Rules ↓
She slid Susan the present. She slid the present to Susan.

However, general linking rules do not insure that 'slide$_1$' 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:

hand: <agt, pat, goal$_{animate}$> (≈ 'slide$_1$')
↙ ↘
Joe handed his mother a letter. Joe handed a letter to his mother.

That is, we would need to stipulate that 'slide$_1$' 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$_1$' 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$_1$'. That is, instead of needing to stipulate that 'slide$_1$' 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 σ be a function from syntax to semantics, '$+_{syn\text{-}comp}$' a rule of syntactic composition, and '$+_{sem\text{-}comp}$' a rule of semantic composition, the following is claimed hold:

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

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, '$+_{\text{syn-comp}}$', or syntactic composition, must be straightforwardly related to '$+_{\text{sem-comp}}$', 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."[9]

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).[10]

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 voordurend 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 can*not* 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).[11]

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.[12] 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.[13] 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. *set*)	2445 (77%)	2290 (94%)
Variable constructions ("Thematic ambiguity," e.g. *load*)	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).[14]

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.[15]

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.[16]

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).[17]

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.[18]

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 construction; 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.