

## Chapter 1

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### Introduction

The hypothesis that the syntactic properties of verbs are determined by their meaning has long intrigued researchers in linguistics and related fields. The most striking illustration of the role of meaning in the determination of syntax is the tendency for arguments bearing certain semantic roles to be associated with particular syntactic expressions. These tendencies were noted by traditional grammarians dating at least as far back as Pāṇini, and they are encoded, for example, in the “subjectivalization” rule proposed by Fillmore (1968), stated in terms of deep case relations. Following Carter (1988), we call the regularities in the association of arguments bearing certain semantic roles to particular syntactic expressions *linking regularities*, and the rules that effect such associations *linking rules*. To the extent that the semantic role of an argument is determined by the meaning of the verb selecting it, the existence of linking regularities supports the idea that verb meaning is a factor in determining the syntactic structure of sentences. The striking similarities in the linking regularities across languages strongly suggest that they are part of the architecture of language.

Although linking regularities are widely acknowledged to exist, many unresolved issues must be confronted in order to develop a full theory of the mapping between lexical semantics and syntax. Not least among them is the determination of the extent to which the syntactic expression of arguments is predictable and cross-linguistically regular. Another, equally important issue concerns the nature of the lexical semantic representation, since the linking rules are formulated in terms of elements in this representation. A theory of linking, therefore, must be built on a fully articulated theory of lexical semantic representation, yet there is little consensus regarding the nature of this representation.

The resolution of these issues has become all the more urgent because of certain recent developments in syntax. As a result of efforts to develop a constrained theory, various theories of syntax harness idiosyncratic properties of verbs, particularly their meanings, to explain certain properties of the syntactic configurations in which they are found (for discussion, see Wasow 1985). These theories share the assumption that aspects of the syntax of a sentence are determined by the meaning of the verb in that sentence. This assumption is implicit in early formulations of the Projection Principle (Chomsky 1981), and it finds explicit expression in the theory first proposed by Pesetsky (1982), and later adopted by Chomsky (1986b), that s-selection (semantic selection) determines c-selection (categorical selection). (Although as we discuss in section 5.4 and the afterword, several researchers have recently argued for a very different relationship between lexical and syntactic structure.)

Over the past fifteen years, the relationship between lexical semantics and syntax has received substantial attention in the context of the Unaccusative Hypothesis (Perlmutter 1978). This hypothesis proposes that the class of intransitive verbs is not homogeneous, but consists of two subclasses, each associated with a distinct syntactic configuration. There appear to be striking semantic regularities in the composition of the two classes of intransitives, regularities that are manifested across languages in impressive similarities in verb classification. Because of the convergence of semantic and syntactic properties that characterize it, unaccusativity provides fertile ground for exploring the relationship between lexical semantics and syntax. The importance of the Unaccusative Hypothesis is that, if correct, it allows us to use unaccusativity as a means of identifying aspects of verb meaning that are relevant to the syntax and of appropriately formulating at least some of the linking rules. Besides representing an extended investigation into the nature of unaccusativity, this book is intended as a contribution to the development of a theory of lexical semantic representation and to the elucidation of the mapping from the lexical semantic representation to syntax.

### 1.1 Unaccusativity Introduced

The Unaccusative Hypothesis, as first formulated by Perlmutter (1978) within the context of Relational Grammar and later adopted by Burzio (1986) within the Government-Binding (GB) framework (Chomsky 1981),<sup>1</sup> is a syntactic hypothesis that claims that there are two classes of

intransitive verbs, the *unaccusative* verbs and the *unergative* verbs, each associated with a different underlying syntactic configuration. For example, from a GB perspective—the approach we use in this book—an unergative verb takes a D-Structure subject and no object, whereas an unaccusative verb takes a D-Structure object—be it clausal or a simple NP—and no subject. Thus, the members of the two classes are associated with the D-Structure syntactic configurations schematized in (1).<sup>2</sup>

- (1) a. Unergative verb: NP [<sub>VP</sub> V]  
 b. Unaccusative verb: \_\_\_\_\_ [<sub>VP</sub> V NP/CP]

Alternatively, in argument structure terms, an unergative verb has an external argument but no direct internal argument, whereas an unaccusative verb has a direct internal argument but no external argument.<sup>3</sup>

There is another syntactic characteristic associated with this verb class. As reflected in the name given to the class, an unaccusative verb is unable to take an object with accusative case (or in GB terms, it is unable to assign structural Case to its object). Burzio (1986) has studied this facet of unaccusativity extensively, noting a correlation between the ability of a verb to take an external argument and its ability to assign structural Case. Given the statement of this correlation, which has come to be known as Burzio's Generalization,<sup>4</sup> an alternative definition is sometimes adopted for an unaccusative verb: an unaccusative verb is one that does not take an external argument (i.e., is unable to assign a  $\theta$ -role to its subject). For the most part the two definitions pick out the same range of verbs as unaccusative, making it unnecessary to choose between them.<sup>5</sup> Nevertheless, in this book we have chosen to use the definition involving Perlmutter's characterization of the class: an unaccusative verb is one that takes an internal argument but no external argument. On this definition, unaccusative verbs are identical in D-Structure configurational terms to passive verbs, which also have a direct internal argument but no external argument.

Since the introduction of the Unaccusative Hypothesis, a wide range of phenomena in various languages have been studied that purport to distinguish between unaccusative and unergative verbs (see Grimshaw 1987 for an overview, as well as the entry on unaccusativity in Dubinsky and C. Rosen's (1987) *Relational Grammar* bibliography). We refer to these phenomena as *unaccusative diagnostics*. Since the Unaccusative Hypothesis claims that the two classes of intransitive verbs are syntactically defined, it appeals to the difference in syntactic configuration to explain many of

the diagnostics that reveal differences in behavior between the classes. Only apparent diagnostics whose ability to discriminate between the two classes can be explained in this way are *actual* unaccusative diagnostics. It turns out that not every phenomenon that appears to distinguish between two classes of intransitive verbs is actually an unaccusative diagnostic in this strong sense.

Much of the initial research on unaccusativity was directed toward establishing the syntactic aspect of unaccusativity, that is, toward proving that there are verbs with the syntactic properties attributed to unaccusative verbs by the Unaccusative Hypothesis. Originally, little attention was paid to the relation between the meaning of intransitive verbs and their membership in the unaccusative or unergative class, although the paper in which Perlmutter introduced the Unaccusative Hypothesis includes a first attempt at delineating the set of semantically defined verb classes that are expected to show unaccusative or unergative behavior. In fact, the Unaccusative Hypothesis was introduced by Perlmutter in the context of the broader Universal Alignment Hypothesis, which suggests that the syntactic expression of arguments is always determinable on the basis of the meaning of the verb. Indeed, the impressive similarity between the verbs selected by unaccusative diagnostics cross-linguistically suggests that there are important semantic facets to the distinction. It has been proposed that the postulation of the Unaccusative Hypothesis permits the statement of a single simple linking generalization that covers transitive and intransitive verbs alike: agent arguments are D-Structure subjects and patient/theme arguments are D-Structure objects (B. Levin 1983, Marantz 1984, C. Rosen 1984, among others). Thus, although the Unaccusative Hypothesis claims that the distinction between the two classes of verbs is syntactically *represented*, it was originally assumed that the distinction is fully semantically *determined*.

## 1.2 Approaches to Unaccusativity

Once more attention was paid to the relationship between the lexical semantics and the syntax of unaccusativity, it became clear that linguistic reality is more complicated than the simple linking generalization mentioned above suggests. This situation is reflected in the existence of what have become known as *unaccusative mismatches* (L. Levin 1986): cases in which there seems to be an imperfect match between the verbs expected to be selected on semantic or syntactic grounds as unaccusative or unerga-

tive by various diagnostics and the verbs actually selected by those diagnostics. Below we will distinguish between two kinds of mismatches, one that has led to the *syntactic approach* to unaccusativity, which denies that unaccusativity is fully semantically predictable, and another that has led to the *semantic approach* to unaccusativity, which denies that unaccusativity is syntactically encoded. In essence, this book is an extended attempt to meet the challenges that the mismatches present to Perlmutter's original hypothesis that unaccusativity is both syntactically encoded and semantically predictable. The original thesis will be defended throughout the book. In the remainder of this section we lay out the essentials of the syntactic and semantic approaches to unaccusativity and discuss the problems with these two approaches. At the same time we highlight the methodological considerations that are relevant to meeting the challenges that these approaches pose.

### 1.2.1 The Syntactic Approach

The existence of phenomena that suggest that the classification of verbs as unaccusative or unergative cannot be completely determined semantically has led to the development of the syntactic approach to unaccusativity, first systematically defended by C. Rosen (1984). On this approach, all that unaccusative verbs have in common is a particular syntactic configuration, although Rosen and other proponents of this approach do not deny that there tend to be certain correspondences between the meanings of verbs and their classification as unaccusative or unergative. In this section we discuss the phenomena that Rosen cites in favor of the syntactic approach in order to show that they do not necessarily warrant the conclusions she draws from them.

First, Rosen makes much of the fact that there is no single semantic property common to all unaccusative verbs selected by all diagnostics in all languages (see also Baker 1983, DeLancey 1985, among others). However, the hypothesis that the classification of verbs as unergative or unaccusative is predictable on the basis of meaning in no way implies that all unaccusative verbs or all unergative verbs represent a unified semantic class. Although this point should be obvious, it is worth stressing since often researchers strive to find a uniform semantic characterization for the unaccusative class. But given the many-to-one character of the mapping from lexical semantics to syntax, there is no reason to assume that all verbs that have the syntactic properties attributed to unaccusative verbs will form a semantically homogeneous class. There is no more reason

to assume that the unaccusative class is semantically homogeneous than there is to assume the same about the class of transitive verbs. And one of the points that will emerge from our study of unaccusativity, particularly in chapters 3 and 6, is precisely that the class is not unified semantically. We will show that this assumption has far-ranging consequences since the members of the different subclasses of the unaccusative verb class differ in certain aspects of their behavior; nevertheless, they can all be shown to be legitimate members of the class.

Second, Rosen shows that verbs with similar meanings in and across languages may be classified differently with respect to unaccusativity. For example, she claims that the verb corresponding to *die* acts like an unaccusative verb in Italian, but like an unergative verb in Choctaw (although see Martin 1991 and section 1.2.3 for further discussion of the Choctaw data). Within Italian itself, verbs of bodily process diverge in their behavior: the verb *russare* 'snore' manifests unergative properties, whereas the verb *arrossire* 'blush' manifests unaccusative properties.

Third, Rosen discusses the existence of individual verbs that appear to be classified as both unaccusative and unergative by the same diagnostic. For example, as Rosen points out, certain Italian intransitive verbs are found with both the auxiliary *avere* 'have' and the auxiliary *essere* 'be'. (For reasons of consistency and clarity, glosses of some quoted examples have been expanded or slightly modified.)

- (2) a. Mario ha continuato. (\*è)  
       Mario has continued is  
       'Mario continued.'
- b. Il dibattito è continuato. (\*ha)  
       the debate is continued has  
       'The debate continued.'
- (C. Rosen 1984:45, (21))

- (3) correre 'to run', saltare 'to jump', volare 'to fly', vivere 'to live',  
       suonare 'to toll', fiorire 'to bloom' (Centineo 1986:220, (o), (q))

The pattern of auxiliary selection is problematic since with intransitive verbs the selection of *essere* 'be' is considered to be a signal of unaccusative status, whereas the selection of *avere* 'have' is considered to be a signal of unergative status (Burzio 1986, Perlmutter 1989, C. Rosen 1981, among others). Consequently, Rosen concludes from the existence of dual auxiliary verbs that the distinction between the unaccusative and unergative classes is not completely characterizable in terms of meaning alone.<sup>6</sup>

Before we discuss each of the problems just mentioned individually, we provide a brief general evaluation of the syntactic approach. There is no question that in comparison with the syntax, the lexicon is the domain of the idiosyncratic. But the heightened attention that has been paid to lexical matters in recent years has revealed that although many idiosyncratic phenomena are lexical in nature, much of the lexical knowledge that speakers have of their language is systematic, most likely reflecting deep principles of grammar. In fact, aspects of what Chomsky (1986b) has termed “Plato’s problem” are as evident in the domain of the lexicon as in the domain of syntax. That is, it is fairly clear that speakers acquire complex knowledge concerning lexical items for which it is hard to argue that they receive direct evidence.

To illustrate this point, we preview a contrast that we discuss at length in chapter 5. This contrast involves the behavior of agentive verbs of manner of motion in the English resultative construction. As the examples show, verbs of manner of motion can appear in two forms of the resultative construction: one involving no object, as in (4a), and one involving a reflexive object, as in (4b).

- (4) a. Jump clear of the vehicle!  
 b. Don’t expect to swim yourself sober!

As we show in chapters 2 and 5, the objectless resultative is an unaccusative diagnostic, whereas the form with a reflexive object signals that the verb in the construction is unergative. These examples show, then, that agentive verbs of manner of motion can appear in the resultative construction in the pattern expected of unaccusative verbs, as in (4a), or in the pattern expected of unergative verbs, as in (4b). Examples such as these may at first glance be taken to illustrate the idiosyncratic nature of verb classification; that is, agentive verbs of manner of motion can be classified as either unaccusative or unergative. But on closer examination, the opposite turns out to be true. The examples in (4) are not idioms or fixed expressions; furthermore, it can be shown that despite surface appearances the presence or absence of the reflexive is not random.

- (5) a. \*Jump yourself clear of the vehicle!  
 b. \*Don’t expect to swim sober!

An in-depth examination of the phenomenon in chapter 5 will show that the judgments of native speakers concerning the grammaticality and interpretation of such constructions are subtle and consistent. If the seemingly

unpredictable behavior of agentive verbs of manner of motion is by hypothesis expected to be principled, we are forced to seek a principled explanation for it. In chapter 5 we will show that it is possible to predict precisely when agentive verbs of manner of motion will appear in the resultative construction in the guise of unergative verbs and when in the guise of unaccusative verbs.

The resultative example illustrates that unless we take as our starting point the hypothesis that the behavior of verbs is indeed principled, we can easily take the sentences in (4) to be evidence for their idiosyncratic behavior. We acknowledge that there is room for idiosyncrasy in the lexicon, so that in languages where there is explicit evidence for the classification of verbs as unaccusative or unergative (such as, for example, from morphological properties), the classification may not be entirely predictable; nonetheless, it is methodologically most useful to assume that the class membership of each verb is for the most part predictable and to test the limits of this hypothesis. After all, taking the assumption that all is chaos as the starting point of our investigation is not likely to lead us to a better understanding of the interface between lexical semantics and syntax.

Furthermore, there are language acquisition considerations that raise clear problems for the syntactic approach. Assuming that a language such as English, which lacks morphological clues that could distinguish between unaccusative and unergative verbs, does encode this distinction syntactically, then learnability considerations dictate that the distinction must be fully determined by the semantics. For example, in chapter 2 we present extensive evidence involving the resultative construction that the distinction between unaccusative and unergative verbs must be syntactically represented in English, even though the overt evidence for this distinction is rather slim. It is unlikely that every child learning English will necessarily have access to evidence concerning the behavior of each intransitive verb acquired with respect to the kinds of phenomena that force the postulation of an unaccusative or unergative classification for that verb. If Universal Grammar allows both unaccusative and unergative D-Structure configurations for intransitive verbs, then how does the language learner know how to classify newly learned verbs? There are two options: either (i) the choice is predictable on the basis of the meaning of the verb being acquired, or (ii) there must be some way, on the basis of simple data, to determine what class a given verb belongs to. Since option (ii) appears not to be correct for English, then, if the Unaccusative Hy-



pothesis holds, a verb's class membership must be completely determined on the basis of its meaning. It is possible, however, that in languages with overt morphological markers of unaccusativity, membership in the unaccusative or unergative class may be grammaticalized; since there are overt indicators of class membership, the members of the classes may show some deviation from the semantic criteria for class membership.

Let us now briefly consider how the mismatches that Rosen discusses can be dealt with. As we note elsewhere (B. Levin and Rappaport 1989, B. Levin and Rappaport Hovav 1991, 1992), the existence of verbs with similar meanings but different classifications need not have the implications for the Unaccusative Hypothesis that Rosen suggests. The key to dealing with these mismatches is the recognition that certain aspects of verb meaning are relevant to the syntax and other aspects of meaning are not, a point also made forcefully by Pinker (1989). It is only after the syntactically relevant aspects of meaning are isolated that it is possible to evaluate whether two verbs are expected to have the same classification with respect to the Unaccusative Hypothesis. Consider once again Rosen's example concerning the varied classification of Italian verbs of bodily process. The behavior of these verbs is only problematic for the Unaccusative Hypothesis if the verbs belong to the same syntactically relevant semantic class. In fact, it is unclear whether the notion "bodily process" can be used to define such a class. There are other ways of classifying these verbs according to meaning, and some of these alternative semantic classifications do not necessarily put all bodily process verbs into the same class. The concept denoted by the English verb *snore* can be classified as an activity, whereas that denoted by the English verb *blush* is open to an activity or change-of-state interpretation, depending on one's perspective. What is interesting is that the Italian verb *arrossire* 'blush' literally means 'become red', suggesting that in Italian this verb can be considered a verb of change of state.<sup>7</sup> Several recent studies have converged on the conclusion that semantic notions such as "activity" and "change of state" are aspects of meaning that are relevant to the classification of verbs (Dowty 1991, Pinker 1989, Pustejovsky 1991b, Tenny 1987, 1992, Van Valin 1990, among others); if so, there is no reason to expect the verbs *snore* and *blush* to pattern in the same way. In general, a comparison of the status of two apparently similar verbs either in a single language or in two different languages is only valid if the comparison is made with respect to components of meaning relevant to the determination of unaccusativity. We devote much of chapters 3, 4, and 5 to isolating

those aspects of meaning that figure in the classification of verbs and to uncovering exactly how these components of meaning contribute to verb classification.

The same considerations lead to a solution for the problem posed by verbs, such as the agentive verbs of manner of motion, that select two auxiliaries. Work by various researchers (see, among other works, Hoekstra 1984, L. Levin 1986, Van Valin 1990) has revealed that for at least a subset of the dual auxiliary verbs, the choice of auxiliary is associated with systematic differences in meaning (see section 5.1.1). As we show in chapter 5, dual auxiliary verbs are just one instance of the more general phenomenon of verbs that show multiple classification with respect to a variety of syntactic phenomena. We term such verbs *variable behavior verbs*. In chapter 5 we investigate several types of variable behavior verbs, including certain dual auxiliary verbs, and demonstrate that each type of variable behavior verb is associated with two meanings differing precisely in those elements of meaning that we have found to be syntactically relevant. If such correlations can be shown to hold more generally, then the existence of verbs with multiple classifications does not present a problem for the hypothesis that unaccusativity is semantically determined; rather, it shows yet again the importance of pursuing the search for syntactically significant components of verb meaning. Furthermore, it is fruitful methodologically to make variable behavior verbs a focus of study since contrasting the meaning of a verb when it shows one type of syntactic behavior with the meaning of the same verb when it shows another type of syntactic behavior will aid in the isolation of just those aspects of meaning that are relevant to the syntactic classification of verbs.

### 1.2.2 The Semantic Approach

The syntactic approach can be contrasted with the semantic approach to unaccusativity. The claims of the semantic approach are that the two classes of intransitive verbs can be differentiated on semantic grounds and that the semantic characterization of the two classes obviates the need to attribute different syntactic representations to the verbs they contain. This approach can be contrasted with ours since, although it assumes that unaccusativity is semantically determined, it denies that it is syntactically encoded. The most thorough attempt at developing and justifying the semantic approach to unaccusativity is presented by Van Valin (1990). Van Valin claims that “the phenomena which the Unaccusative Hypothe-

sis (UH) strives to explain in syntactic terms are better explained in semantic terms” (1990:221). We will not review Van Valin’s theory here, since we do so in section 2.4.2.1. Here we discuss some properties of the semantic approach in general and also point out some problems that it faces.

Recall that on the syntactic approach to unaccusativity, unaccusative and passive verbs are found in the same D-Structure syntactic configuration. And indeed there are syntactic and morphological phenomena that class unaccusative verbs and passive verbs together. For instance, as we discuss in chapter 2, in English resultative phrases can be predicated of the S-Structure subjects of passive and unaccusative verbs but not of those of unergative and transitive verbs. Prenominal perfect/passive participles may modify the S-Structure subjects of passives (*a badly written letter*) and unaccusatives (*a recently appeared book*) but not those of unergatives (*\*a hard-worked lawyer*) and transitives (*\*a much-painted artist*) (B. Levin and Rappaport 1986, Rappaport Hovav and B. Levin 1992). In contrast, *-er* nominals refer to the S-Structure subjects of unergatives and transitives but not to those of unaccusatives and passives (B. Levin and Rappaport 1988). Similarly C. Rosen (1981) and Perlmutter (1989), among others, argue that Italian participial absolutes can be predicated of S-Structure subjects of unaccusative and passive verbs but not of S-Structure subjects of transitive and unergative verbs. C. Rosen (1984) also mentions voice marking in Albanian, citing Hubbard (1980): unaccusative and passive verbs share a voice-marking morpheme, which is lacking on transitive and unergative verbs. The existence of such phenomena provides strong support for the syntactic approach, since, by hypothesis, unaccusative verbs and passive verbs appear in the same syntactic configurations, and it is difficult to find a semantic property shared by all passive and unaccusative verbs, a point also emphasized by Burzio (1986). Proponents of the semantic approach would have to claim that the objects of transitive verbs and the subjects of unaccusative verbs share a single semantic property. On Van Valin’s semantic approach to unaccusativity, all such phenomena make reference to verbs taking an argument with the macrorole undergoer, but with no argument taking the macrorole actor. Van Valin shows that the notion “undergoer” is not equivalent to the notion “direct object,” since, for example, the object of a multiargument activity verb such as *eat* is a direct object but not an undergoer. Be this as it may, it seems to us misleading to claim that the notion “undergoer” is semantic, since it cannot be reduced to any single semantic notion.

Rather, it can be characterized as a generalization over a number of specific semantic roles; the undergoer is chosen based on an algorithm that makes reference to these specific semantic roles. Therefore, it seems to us that such phenomena strongly support the syntactic approach.

But the semantic approach has been motivated by a second kind of unaccusative mismatch, which highlights the fact that most unaccusative diagnostics do not single out the sole argument of all unaccusative verbs and the D-Structure objects of all passive verbs. This kind of mismatch involves the existence of two or more apparent unaccusative diagnostics that single out distinct (but not necessarily disjoint) semantically coherent classes of verbs. This type of mismatch can be exemplified with data from Dutch. Zaenen (1993) shows that two purported diagnostics of unaccusativity in Dutch turn out to be sensitive to two different semantic features. Prenominal perfect participles are usually said to modify the S-Structure subjects of unaccusative verbs, as in (6), but not unergative verbs, as in (7).

(6) de gevallen/(pas) gearriveerde jongen  
 the fallen/(just) arrived boy  
 (Zaenen 1993:140, (42))

(7) \*de gewerkte/getelefoneerde man  
 the worked/phoned man  
 (Zaenen 1993:140, (41))

It turns out, however, that according to Zaenen these participles may modify the subjects of telic intransitive verbs, a set of verbs that turns out to be a subclass of the unaccusative verbs, but not the subjects of atelic intransitive verbs. (English shows a similar pattern (B. Levin and Rappaport 1989).) Thus, the following example involving an atelic verb that is classified as unaccusative by other diagnostics is unacceptable:

(8) \*De gebleven jongen  
 the remained boy  
 (Zaenen 1993:141, (45a))

On the other hand, in Dutch impersonal passivization is supposed to be impossible with unaccusative verbs (Perlmutter 1978), but Zaenen argues that only verbs whose subjects do not show “protagonist control,” a term introduced by McLendon (1978:4), fail to undergo impersonal passivization, whether they are independently considered to be unaccusative, as in (9), or unergative, as in (10), on the basis of other diagnostics.

- (9) \*In dat ziekenhuis werd er (door veel patienten) gestorven.  
 in that hospital was there by many patients died  
 'In that hospital there was died by many patients.'  
 (Zaenen 1993:131, (8b))
- (10) \*Er werd (door de man) gebloed.  
 there was by the man bled  
 'There was bled by the man.'  
 (Zaenen 1993:131, (7b))

If the explanation for these two diagnostics lies in the syntactic configuration required by the verbs, then such diagnostics are not expected to distinguish between semantically coherent subclasses of verbs. From mismatches of this sort, some researchers have concluded that a syntactically encoded distinction between unaccusative and unergative verbs is unnecessary and that the distinction between unaccusative and unergative verbs is purely semantic, and not syntactic; see, for example, Napoli 1988 for discussion along these lines with respect to English.

On the semantic approach, the nonhomogeneous behavior of intransitive verbs stems from the fact that some constructions are compatible with verbs with certain types of meanings, and others are compatible with verbs with other types of meanings. The bifurcation in the intransitive class, then, does not reduce to any syntactic feature of the verbs, but follows from the compatibility of different semantically defined verb classes with the semantic constraints on the different constructions. In this respect, intransitive verbs are no different from transitive verbs, some of which are compatible with certain constructions and others of which are not. Moreover, the same kind of bifurcation is expected *within* the unaccusative class. Since each construction is associated with its own semantic constraints, there is no reason to assume that all diagnostic constructions should differentiate among the intransitive verbs in the same way. One construction may distinguish telic from atelic verbs; a second may distinguish agentive from nonagentive verbs. Therefore, a single verb may be classified as "unaccusative" by one diagnostic but as "unergative" by another. In this way, the semantic approach explains why most diagnostics single out semantically coherent subclasses of verbs, while allowing for certain types of mismatches. (See also Dowty 1991 for related discussion.)

On our approach to unaccusativity, it is not surprising that the verbs selected by various diagnostics can receive a proper semantic characterization. After all, we argue that the syntactic classification of verbs is

semantically determined. But the fact that the verb classes can be given a semantic characterization does not preclude the attribution of common syntactic properties to all unaccusative verbs. In fact, the original motivation for the Unaccusative Hypothesis was the recognition that some diagnostics are *explained* by the postulation of two syntactically distinct subclasses of the intransitive verbs, an aspect of the syntactic approach that proponents of the semantic approach largely ignore.

The choice between the two approaches rests on showing whether there is any need to postulate a syntactic difference between the unaccusative and unergative verbs. For the proponents of the semantic approach, this means demonstrating an explanatory connection between the semantic classification of a verb and the diagnostics, thus obviating the need for a syntactic encoding of the distinction between unaccusative and unergative verbs. At the heart of the semantic approach is the proposal that certain constructions, by virtue of their meaning, “select” for verbs belonging to certain semantic classes. But in order to show that the semantic approach is to be preferred over the syntactic approach, it is not sufficient to show that the class of verbs selected by each of the diagnostic constructions can be given a semantic characterization; it must also be shown that the semantic characterization will explain the compatibility of the members of a verb class with that construction. For example, in chapter 3 we argue that although the verbs that participate in the causative alternation can be characterized semantically, there is a syntactic component to the explanation of why just these verbs participate in the alternation as they do; if this account is correct, it constitutes support for the syntactic approach. The presence of syntactic and semantic components to the explanations of several of the diagnostics we examine in this book suggests that a verb’s ability to be found in the unaccusative syntactic configuration may be a necessary, but not a sufficient, condition for the verb to manifest some property. This reflects the fact that many constructions are also associated with their own semantic constraints. For example, although resultative phrases in English may be predicated of subjects of unaccusative, but not unergative, verbs, there is a semantically defined subset of unaccusative verbs whose subjects cannot have resultative phrases predicated of them for independent reasons, as we show in section 2.3.2.

Moreover, the semantic properties of the verb may be a necessary, but not a sufficient, condition for passing an unaccusative diagnostic. Such a case is provided by auxiliary selection in Dutch. Both Van Valin (1990) and Zaenen (1993) discuss auxiliary choice as a diagnostic that is sensitive

to a semantic property, namely, telicity. The claim is that all and only telic verbs select the auxiliary *zijn*, the Dutch equivalent of English *be*. Although the connection between the syntactic properties of unaccusative verbs and their selection of the *be* auxiliary in several languages is not well understood (Grimshaw 1987; though see Burzio 1986, Vikner 1991, among others, for some proposals), Everaert (1992) points out that even on a descriptive level the generalization linking auxiliary selection to telicity, as close as it is to being correct, is not entirely accurate. Everaert shows that, at least in Dutch, a sentence that meets the criterion of telicity can nonetheless contain the auxiliary *hebben*, the Dutch counterpart of English *have* and Italian *avere*, if the sentence contains either a light verb construction, as in (11a), or an idiom that involves a verb plus object, as in (11b).

- (11) a. Het vliegtuig heeft een landing gemaakt.  
           the plane    has a landing   made  
           ‘The plane has made a landing.’  
           (Everaert 1992:4, (12a))
- b. Hij heeft zich uit de voeten gemaakt.  
           he has   self out of the feet made  
           ‘He fled.’  
           (Everaert 1992:7, (24b))

The contrast between the selection of the auxiliary *hebben* ‘have’ in the light verb construction in (11a) and the selection of the auxiliary *zijn* ‘be’ in a near paraphrase involving a simple verb with the same meaning in (12) illustrates this point.

- (12) Het vliegtuig is geland.  
        the plane    is landed  
        ‘The plane has landed.’  
        (Everaert 1992:4, (11a))

Therefore, even if telicity is the meaning component relevant to auxiliary selection, it is applicable only if the verb phrase is intransitive in a purely *syntactic* way. That is, it is necessary, but not sufficient, that a verb be telic if it is to select *zijn* ‘be’.<sup>8</sup>

Summarizing the difference between the syntactic and semantic approaches to unaccusativity, the syntactic approach takes unaccusativity to be a unified phenomenon: all unaccusative verbs, no matter what their semantic class, share certain syntactic properties (the selection of a direct

internal argument, the lack of an external argument, and the inability to assign accusative Case). Not all unaccusative verbs are expected to give positive results with respect to all unaccusative diagnostics, because, as we mentioned above, an unaccusative classification is often a necessary, but not a sufficient, condition for a verb to test positive with respect to certain unaccusative diagnostics. Despite these differences, all unaccusative verbs share a particular set of syntactic properties. On the semantic approach, in contrast, unaccusativity is not a unified phenomenon, and a single verb can test as “unaccusative” according to one diagnostic and as “unergative” according to another diagnostic, a point also discussed by Dowty (1991).

### 1.2.3 Further Methodological Considerations

The discussion of the syntactic and semantic approaches to unaccusativity underscores that, as in any area of linguistics, there are various methodological considerations that must be kept in mind in making claims about the viability of a particular approach to unaccusativity. The complexity of unaccusative phenomena coupled with the fact that unaccusative phenomena involve the interface between lexical semantics and syntax means that care is especially necessary in this respect. In particular, it is difficult to make claims about unaccusativity in a given language unless both the syntax and the lexical semantics of the language are well understood. In this section we mention some additional methodological considerations that must be taken into account in investigating the nature of unaccusativity.

First—and possibly most obviously—in making a claim about the unaccusative or unergative status of a given verb, the diagnostic used to make the classification must be a legitimate diagnostic. A valid unaccusative diagnostic is one that tests for a syntactic property whose explanation is tied to the unaccusative syntactic configuration. (Furthermore, even diagnostics that receive a syntactic explanation need to be carefully evaluated to be sure that they test for what they are claimed to test for.) After all, unaccusativity as we define it is a syntactic property, even if we do claim that it is semantically predictable. It is precisely because we are using unaccusativity to explore the mapping between lexical semantics and syntax that it is important that we provide a syntactic means of identifying unaccusative verbs, so that we have an independent check on the hypotheses we present concerning the nature of the semantic determination of unaccusativity.



Some purported unaccusative diagnostics, especially those with no inherent connection to direct objecthood, may turn out not to be diagnostics for unaccusativity. For instance, C. Rosen (1984), drawing on Davies 1981, cites verb agreement as an unaccusative diagnostic in the Muskogean language Choctaw. On this basis, she points out that the Choctaw counterpart of English *die* is unergative. Martin (1991), on the basis of a thorough study of agreement in another Muskogean language, Creek, argues that the evidence that had been used to link verb agreement to underlying grammatical relations is not strong. Instead, he argues that it simply tests for a semantic property of the verb.<sup>9</sup> He concludes that verb agreement should not be considered a valid unaccusative diagnostic and that therefore the Choctaw data do not pose a problem for the Unaccusative Hypothesis.

It is important, then, to reevaluate purported diagnostics before using them to draw conclusions about verb classification. In this book we will reevaluate three diagnostics in depth, rejecting one of them in the process. We will also use several other diagnostics whose status we believe to have been well established, recognizing that ideally these too should receive further scrutiny.

There is one more point we want to make in this section. Although it is desirable to look at a range of languages to test the generality of claims being made about unaccusativity, and although our understanding of unaccusativity has benefited immensely from cross-linguistic studies, it is equally important when undertaking a study of the interface between lexical semantics and syntax to restrict the discussion to languages the researcher is familiar with. Because of the subtle judgments about verb meanings that are required to uncover the syntactically relevant components of verb meaning and the intricate patterns of behavior that need to be examined as part of this process, a knowledge of the languages under consideration that goes beyond what most dictionaries and reference grammars offer is necessary. For this reason, we have focused our investigation on a few languages we are familiar with and have given the most weight to data from English. We hope that our study will establish a general research strategy that can be extended to other languages as well.

### 1.3 Deep versus Surface Unaccusativity

Research on unaccusativity initially focused on the fact that the single arguments of some intransitive verbs show object-like properties despite

being expressed like subjects of transitive verbs at S-Structure. Subsequent research revealed purported unaccusative constructions in which the single argument of certain intransitive verbs not only shows object-like properties but also is apparently expressed like the object of a transitive verb. In Italian, for example, there is evidence that the sole argument of an unaccusative verb can appear as a direct object at S-Structure (Belletti 1988, Belletti and Rizzi 1981, Burzio 1986, among others). The evidence comes from a number of grammatical phenomena, including *ne*-cliticization. For example, in Italian the single argument of an unaccusative verb such as *arrivare* 'arrive' can appear either before the verb, as in (13a), or after the verb, as in (13b).

- (13) a. Molti esperti arriveranno.  
           many experts will arrive  
           'Many experts will arrive.'  
       b. Arriveranno molti esperti.  
           will arrive many experts  
           'Many experts will arrive.'  
           (Burzio 1986:21, (4i))

Verbs such as *arrivare* 'arrive' permit *ne*-cliticization to apply to their sole argument, but only when it appears after the verb—that is, only if it remains in what appears to be surface direct object position.

- (14) a. Ne arriveranno molti.  
           of them will arrive many  
           'Many of them will arrive.'  
           (Burzio 1986:22, (5i))  
       b. \*Molti ne arriveranno.  
           many of them will arrive  
           (Burzio 1986:23, (7c))

*Ne*-cliticization, then, is a diagnostic that applies only if the argument of the unaccusative verb remains in a postverbal position throughout the derivation. It contrasts with a diagnostic such as auxiliary selection, which applies regardless of the surface position of the argument. For example, the verb *arrivare* 'arrive' selects the auxiliary *essere* 'be' independently of the surface position of its argument.

- (15) a. Gianni è già arrivato.  
           Gianni is already arrived  
           'Gianni has already arrived.'

- b. È arrivato Gianni.  
 is arrived Gianni  
 ‘Gianni has arrived.’

As this discussion suggests, the unaccusative diagnostics themselves are of two types. We call diagnostics such as *ne-cliticization diagnostics of surface unaccusativity* and those such as auxiliary selection *diagnostics of deep unaccusativity*. In English surface unaccusativity is manifested only in the *there*-insertion construction (*There appeared a ship on the horizon*) and the locative inversion construction (*Into the room came a man*). In both constructions the single argument of an intransitive verb appears to be in the syntactic position of the object of a transitive verb (see, among others, Burzio 1986, Hoekstra and Mulder 1990, and L. Levin 1986 for discussion of *there*-insertion, and Bresnan 1993, Bresnan and Kanerva 1989, Coopmans 1989, Hoekstra and Mulder 1990, and L. Levin 1986, as well as chapter 6, for discussion of locative inversion). Among the unaccusative diagnostics posited for English, the resultative construction qualifies as a diagnostic of deep unaccusativity. It is the D-Structure status of the argument of an intransitive verb that determines whether or not that verb will be found in this construction (see chapter 2 for an extensive discussion of this construction). An explanatory theory of unaccusativity should predict which unaccusative diagnostics work in which way. In chapter 6 we suggest that phenomena involving discourse function and relations involving quantifier scope will show properties of diagnostics of surface unaccusativity, since these are relations that are set at S-Structure. Diagnostics that rest on properties like  $\theta$ -role assignment or the building of compositional semantics will show properties of deep unaccusativity.

But there is another property of surface unaccusative diagnostics that needs to be emphasized. The constructions that are sensitive to surface unaccusativity are typically restricted to a subclass of the unaccusative verbs: verbs of existence, such as *exist*, *remain*, and *thrive*, and verbs of appearance, such as *appear*, *arise*, and *emerge* (see Kimball 1973, Milsark 1974, Penhallurick 1984, among others, and chapter 6 for discussion of this restriction as it applies to locative inversion and *there*-insertion). For example, verbs of change of state, which we argue in chapters 3 and 4 to be unaccusative, are rarely compatible with the English surface unaccusative constructions.

- (16) a. \*On the streets of Chicago melted a lot of snow.  
 b. \*There melted a lot of snow on the streets of Chicago.

This property is not all that surprising since many unaccusative diagnostics are restricted to semantically coherent subsets of the unaccusative class. However, what is problematic is that, as we will show in chapter 6, many unergative verbs also appear in the locative inversion construction in English. There we argue that the appearance of unergative verbs in the locative inversion construction is not due to what we have termed variable behavior. Thus, the dual classification of some verbs as both unaccusative and unergative cannot be used to resolve the problem of unergative verbs in the locative inversion construction.

In chapter 6 we argue that there is in fact little evidence that locative inversion actually diagnoses unaccusativity in English, and that there are problems with considering this construction to be an unaccusative diagnostic. Instead, we attribute the restrictions on the verbs found in this construction, which are reminiscent of, but not exactly like, those associated with unaccusative diagnostics, to the discourse function of the construction. Essentially, the discourse function requires a verb with a single argument in postverbal position. We show that this assumption helps explain certain properties of the construction that are otherwise left unexplained. In the conclusion to chapter 6 we speculate that all diagnostics of surface unaccusativity are not true unaccusative diagnostics, but are simply sensitive to certain postverbal subjects of intransitive verbs. Discourse considerations determine both the S-Structure position of the subject and the classes of verbs that can appear in such constructions. This suggestion stems from the observation that phenomena in other languages that qualify as diagnostics of surface unaccusativity tend to be restricted to the same subclasses of unaccusative verbs as locative inversion, while at the same time being open to a range of unergative verbs.<sup>10</sup>

#### 1.4 Assumptions about Lexical Representations

In this section we set out the assumptions about the structure of the lexicon and the nature of lexical representation that we presuppose throughout this book. Rather than attempting to develop a full theory of the lexicon, we make only those assumptions that are necessary for the issues under investigation. We assume that each verb is associated with two lexical representations: a lexical semantic representation and a lexical syntactic representation. The lexical semantic representation, sometimes called a *lexical conceptual structure* (Hale and Keyser 1986, 1987, Jackendoff 1990) or simply a *conceptual structure* (Jackendoff 1983), encodes

the syntactically relevant aspects of verb meaning, whereas the lexical syntactic representation—typically called an *argument structure*—encodes the syntactically relevant argument-taking properties of a verb. We discuss each representation in more detail below. Given that our goal is to show that unaccusativity is semantically determined but syntactically represented, we are particularly interested in those aspects of the lexical semantic representation that are relevant to the statement of the linking rules.

We begin with a brief discussion of the lexical syntactic representation. As just stated, we assume that each verb is associated with an argument structure that encodes the syntactically relevant argument-taking properties of that verb, and that this argument structure is *not* a representation of the verb's meaning. The conception of argument structure that we adopt is set out in Rappaport and B. Levin 1988. In particular, we assume that these representations allow distinctions to be made between the external argument and the internal arguments of a verb (Williams 1981), with a further distinction among the internal arguments according to whether they are direct or indirect (Marantz 1984). The external argument is expressed in the syntax external to the VP headed by the verb selecting that argument, and the internal arguments are projected inside the VP; the direct internal argument is realized as the argument that is the sister of, and hence governed by, the verb.<sup>11</sup> Following much current work (Grimshaw 1990, Rappaport and B. Levin 1988, Zubizarreta 1987, among others), we assume that the positions in argument structures are not referred to by  $\theta$ -role (semantic role) labels since the argument structure is a purely syntactic representation. For instance, the argument structure we would posit for the verb *put* would be as follows:

(17)  $e, x \langle y, P_{loc} z \rangle$

The three variables in this structure indicate that *put* is a triadic verb. The variable outside the brackets represents the external argument; the variables inside the brackets represent the internal arguments. The first internal argument is the direct internal argument; the other is an indirect internal argument, which is assigned its  $\theta$ -role by a locative preposition (represented as  $P_{loc}$ ). We assume that the argument structure contains an "event" position, as proposed, for example, by Higginbotham (1985), Rothstein (1983), and Schein (1985), following ideas of Davidson's (1967); this position is the  $e$  in (17). We assume, in addition, that the information in a verb's argument structure, together with the Projection

Principle and the  $\theta$ -Criterion, determine the syntactic configuration that a verb is found in. Thus, we see the relation between argument structure and the D-Structure syntactic representation as being “trivial.” In this last point we differ, for example, from Grimshaw (1990), who proposes that argument structure is not isomorphic to D-Structure.

There is no substantial consensus on the nature of a lexical semantic representation, either with respect to its form or with respect to the elements that it needs to represent. We do not try to articulate a complete theory of lexical semantic representation here; however, we do make some important assumptions about the nature of lexical organization, which the lexical semantic representation must be chosen to accommodate. We review these below.

One of the more striking properties of the lexicon is that many aspects of a verb’s behavior, including the possible expressions of its arguments, appear to be determined by its membership in semantically coherent verb classes (for discussion, see Fillmore 1971, Guerssel et al. 1985, B. Levin 1993, Pinker 1989, among others). Given this observation, it is only reasonable to assume that many of the properties of verbs need not be learned verb by verb but can be learned for a particular verb class as a whole. However, the verb classes cross-classify in intricate ways in terms of their syntactic behavior, and this extensive cross-classification suggests that verb classes themselves are not primitive, but arise because their members share certain basic components of meaning. These are the syntactically relevant components of meaning we have already referred to. The generalizations that implicate semantically coherent verb classes are probably best stated in terms of these components of meaning, just as phonological rules are stated in terms of the basic building blocks of distinctive features. Any lexical semantic representation that is adopted must be able to accommodate these properties of verbs and the classes that they belong to.

Explicit representations of verb meaning have generally been of two types: semantic role lists and predicate decompositions (B. Levin 1994). In the former, the meaning of a verb is reduced to a list of semantic roles that the arguments bear to the verb. In the latter, a verb’s meaning is represented in terms of a fixed set of primitive predicates; the semantic roles can be identified with particular argument positions associated with these predicates. It appears that the syntactically relevant components of meaning can be better expressed in predicate-centered approaches to lexical semantic representation (for additional discussion, see Gropen et al. 1991,

Jackendoff 1987, Pinker 1989, Rappaport and B. Levin 1988, among others). In order to make our discussion more concrete, many of the properties that we require in a lexical semantic representation are illustrated here with a representation that takes the form of a predicate decomposition, but it is not clear that this is the only type of representation that would meet our requirements. Any lexical semantic representation will be consistent with our approach if it recognizes that verb meanings include certain common elements that tie verbs together into semantically defined classes, but at the same time allows for the cross-classification of verbs. These considerations impose certain requirements on the “grain size” of these elements: they must be neither so finely chosen as to prevent the identification of the relevant verb classes, nor so coarsely chosen as to prevent the cross-classification of verbs. In addition, the representation must provide for the encoding of the localized differences in meaning that distinguish among the members of the classes.

A lexical semantic representation that takes the form of a predicate decomposition involves two basic types of primitive elements: primitive predicates and constants. A verb’s meaning is represented using members of a fixed set of primitive predicates, together with constants—typically chosen from a limited set of semantic types—that either fill argument positions in these predicates or act as modifiers of these predicates. A verb’s arguments are represented by the open argument positions associated with these predicates. As an illustration of these points, consider the possible predicate decomposition given in (19) for the intransitive, noncausative use of the verb *break* illustrated in (18).

(18) The window broke.

(19) Noncausative *break*: [*y* BECOME *BROKEN*]

In this representation BECOME represents a potential primitive, and *BROKEN* is a constant that represents the element of meaning that sets the state of being broken apart from other states. On this approach, the semantic relations between verbs and their arguments are defined with respect to the subcomponents in the decomposition (see, for example, Jackendoff 1972, 1987). Typically, predicate decompositions are selected so that verbs belonging to the same semantic class have common substructures in their decompositions. (This assumption also allows the set of primitive predicates used to be restricted in size; ideally, the same primitive predicates might recur in different combinations as well.) For example, all verbs of change of state have in common the substructure

consisting of the primitive **BECOME**, with a constant naming a particular state filling the second argument of **BECOME**.

(20) Noncausative verb of change of state: [*y* **BECOME** *STATE*]

Such templates are what Pinker (1989) calls “thematic cores”; we will refer to them as *lexical semantic templates*. Pinker identifies a dozen or so of these templates.

To take another example, denominal verbs such as *pocket* and *butter* are said to share the same basic decompositional structure—the structure associated with a verb of putting, illustrated in (21)—but to differ in both the choice of constants and the positions that they fill, as shown in (22) (Carter 1976, Jackendoff 1983, 1990).<sup>12</sup>

(21) Verb of putting: [*x* **CAUSE** [*y* **BECOME**  $P_{loc}$  *z*]]

(22) a. *butter*: [*x* **CAUSE** [**BUTTER** **BECOME**  $P_{loc}$  *z*]]

b. *pocket*: [*x* **CAUSE** [*y* **BECOME**  $P_{loc}$  **POCKET**]]

Alternatively, the constant can represent a manner modifier to a predicate. For instance, consider verbs of manner of motion. The verb *amble* has the basic predicate decomposition associated with such a verb, but this decomposition includes a manner modifier that represents what makes this verb different from other verbs of manner of motion such as *stroll* and *wander*. We do not give an example of such a representation; but see Pinker 1989 for one illustration of how such modifiers could be included in predicate decompositions. Pinker (1989) and Jackendoff (1983, 1990) discuss the types of constants that can be found in predicate decompositions. Not only can these constants be elements representing entities in the world, but they can also be what Jackendoff (1990) refers to as “3-D model structures.” These structures can be used not only to encode objects but also to represent what Jackendoff calls “action patterns.”

Much of the research on lexical semantic representation has stressed the basic structures defined by the primitive predicates. Such structures effectively define semantic classes of verbs and determine the syntactic properties of the members of the verb classes. For example, by abstracting away from the templates in (22), we can set out the basic templates that would be characteristic of other verbs in the same classes as *butter* and *pocket*.

(23) a. [*x* **CAUSE** [**STUFF** **BECOME**  $P_{loc}$  *z*]] (cf. (22a))

b. [*y* **CAUSE** [*y* **BECOME**  $P_{loc}$  **LOCATION**]] (cf. (22b))



The constant in a verb's lexical semantic representation is what distinguishes that verb from other verbs of the same semantic type (i.e., verbs sharing the same lexical semantic template). The constant also determines—or, maybe more accurately, restricts—the verb's semantic class membership in the sense that certain constants have features that make them compatible only with certain positions in particular lexical semantic templates; we have indicated this by the labels *STUFF* and *LOCATION* in (23), which are intended to represent the restrictions on these particular open positions. For instance, if the constant represents a physical object that serves as a container, such as a pocket, then it is likely to turn up in templates of the type in (23b), rather than those of the type in (23a). Given this function of the constant, it is not surprising that the “name” of a verb—the phonological form used to label a verb's meaning—is often morphologically derived from or identical to the name of the constant itself. As pointed out by Carter (1976), the use of constants provides the decompositional approach to lexical semantic representation with much of its power. It is precisely by allowing for constants to fill selected positions in a decomposition that it is possible to give a finite characterization of the possible verb meanings that might be found in a language, while allowing for the fact that new verbs can be coined.

We believe that studying the ways in which a language allows verbal lexical semantic templates to be paired with phonological forms provides the key to understanding the variable behavior verbs mentioned in section 1.2.1. There are many departures from a one-to-one association between a meaning and a phonological form: sometimes one meaning is associated with several phonological forms (synonymy), and more often—and more relevant to our concerns—several meanings are associated with one form (polysemy). We are not interested in instances of accidental polysemy (homonymy), but in instances of more systematic polysemy, what Apresjan (1973, 1992) has called *regular polysemy*. This kind of polysemy is the source of variable behavior verbs. In the remainder of this section we raise some issues concerning how the different verb meanings that a particular theory of lexical semantic representation makes available come to be associated with verb names—that is, how certain phonological forms come to be attached as labels to particular verbal semantic concepts, including how some phonological forms come to be attached to more than one verbal semantic concept.<sup>13</sup>

The question of the pairing of verb meanings and verb names is not often systematically or explicitly discussed (the work by Talmy (1975,

1985, 1991) is an exception). When it is discussed, it surfaces in work on polysemy where the following question is being raised: what are the meanings associated with a particular verb name? Is there in fact more than one meaning? We believe that a better understanding of how verb names and verb meanings are paired can be achieved by asking the reverse question: given the verb meanings that a theory of lexical semantic representation makes available, what principles, if any, constrain the ways in which names can be attached as labels to these meanings? For example, which meanings are compatible with a monomorphemic name? Which meanings may—or even must—be associated with a morphologically complex name? Do languages differ regarding the lexical semantic representations that they can associate names with? (This last question is the one that Talmy asks in his important work on lexicalization patterns.) And finally, there is the question that is of particular interest here given the existence of variable behavior verbs: when can two meanings be associated with the same name? We cannot provide a full treatment of these questions, since this is relatively unexplored territory. We attempt only to make some preliminary suggestions about the forms that their answers might take as they pertain to the goal of this book. We hope to investigate these issues further in future research.

A fully articulated theory of lexical semantic representation should be a generative theory that allows for the characterization of all possible verb meanings (see Carter 1976 and Pustejovsky 1991a for discussion of this conception of the lexicon). Many of these possible meanings will be meanings of actual verbs in a language. Those meanings that are actualized need to be associated with a verb name. Putting sound symbolism aside, the association of a morphologically simple phonological form with a particular verbal semantic concept is to a large extent an arbitrary process; for example, there seems to be no reason why the phonological form of the verb *buy* couldn't have been associated with the meaning associated with the verb *sell* and vice versa.<sup>14</sup> Nevertheless, it appears that there are some constraints involved both in determining the choice of names and in governing when two lexical semantic representations can share the same name.

As noted earlier, it is the constants in the lexical semantic representation that differentiate among members of a particular semantic class of verbs. In some sense, the constants serve to identify a particular member of a verb class. There are whole classes of verbs whose members differ in meaning precisely with respect to the choice of constant, and it is therefore

not surprising that in such cases the verb name is derived from that constant. With respect to English, this can be illustrated in several ways.

First, many English verbs are zero-related to nouns that actually denote the content of the constant. For instance, the words *whistle* and *creak* name not only verbs of sound emission but also the nouns that denote the particular sounds that distinguish one of these verbs of sound emission from the other and that presumably serve as the constant in the lexical semantic representation of such verbs. Similarly, many verbs of change of state, such as *dry*, *empty*, and *warm*, are deadjectival, taking their name from the adjective denoting the state whose change typifies that verb, as illustrated in the sample lexical semantic representations for the noncausative, intransitive uses of such verbs in (24), which are all instances of the lexical semantic template in (20), repeated here as (25).

- (24) a. *dry*: [*y* BECOME *DRY*]  
 b. *empty*: [*y* BECOME *EMPTY*]  
 c. *warm*: [*y* BECOME *WARM*]

(25) Noncausative verb of change of state: [*y* BECOME *STATE*]

Second, English has a word formation process known as zero-derivation or conversion; this is the process that creates the verb *modem* from the noun *modem*. This process is a way of associating names with new verbs whose meanings are of certain semantic types: meanings in which the nouns that the verbs take their name from appear as constants in certain designated lexical semantic templates. We do not try to characterize these lexical semantic templates here. What is important is that the meanings of such verbs all involve conventional uses of the entity denoted by the noun, and, as described by Clark and Clark (1979), these conventional uses are determined by the ontological status of the noun—whether it denotes a location, a profession, an instrument, stuff, and so on. It is clearly the nouns, which presumably serve as the constants, that determine verb names. More often than not when there is a verb that has a meaning of the appropriate type, it takes its name from the constant, but there are exceptions (e.g., *drive* rather than \**car*, *row* rather than \**oar*).

Overt morphological markers may be involved in the creation of certain types of verb names. In English, for example, the prefix *de-* combines with a noun to form a name for a verb that involves the removal of the entity denoted by that noun from a location, as in *deice a plane* or *defuzz a sweater*. (Not all verbs of this type are created with the prefix *de-*; conversion can be used to create verbs of removal from certain nouns, when

there is an inalienable possession relationship between the location and located entity, as in *bone* or *core*.)

Sometimes, because of its properties, a single constant can plausibly be associated with more than one lexical semantic template, and to the extent that verbs often take their name from the constant in their lexical semantic representation, the result is that more than one lexical semantic representation will have the same name. The association of a single name with multiple lexical semantic representations due to a common constant is the source of polysemous verbs. These are the variable behavior verbs that we have been discussing. To take a simple example involving the formation of denominal verbs, the same noun might denote an entity that is conventionally either added to or removed from a surface; accordingly, that entity might give its name to either the action of adding or the action of removing that entity. As an illustration, consider an instrument that can be used to put or remove stuff from locations; such an instrument can give its name to the actions involving its use to either add or remove stuff from a surface. The verb *shovel*, for example, shows these two uses; it can be used either as a verb of removal (*shovel the snow off the walk*) or as a verb of putting (*shovel the sand into the truck*). The lexical semantic templates associated with a single verb name can be quite different; the two senses of *shovel* are “opposites,” although both senses of the verb involve changing the location of a substance with respect to some location. In some instances the association of a constant with more than one lexical semantic template may be idiosyncratic, but in others a whole class of constants may qualify for association with more than one template because of their inherent nature. Thus, the association of *shovel* with two templates is not an accident, since there are other verbs like it, including *ladle*, *rake*, *spoon*, and *sponge*.

As these examples show, the members of a set of lexical semantic representations that involve different lexical semantic templates but the same constant can have the same name. In contrast, we are not aware of any instances in which a single name is associated with multiple instantiations of a single lexical semantic template that differ in the choice of constant. Interestingly, it is verbs that share a lexical semantic template but differ in the associated constant that form classes whose members show the same expression of arguments. For example, all verbs of removal share the same lexical semantic template and express their arguments like the verb *shovel* in its removal sense. In contrast, when a single verb name is associated with several lexical semantic representations that are based on dif-

ferent lexical semantic templates but share the same constant, each of the pairings of a particular verb name with a lexical semantic representation is associated with its own distinct argument expression. For instance, *shovel* expresses its arguments one way when it is a verb of removal and another way when it is a verb of putting.

What will emerge from our study of variable behavior verbs in chapter 5 is that there are general patterns of multiple association of lexical semantic templates with verb names. In particular, whole classes of verbs tend to be associated with the same range of multiple meanings. These patterns can be described by statements of the following form:

(26) A verb in semantic class  $x$  is also a member of semantic class  $y$ .

Partly in response to earlier versions of this work, this approach has been criticized by a number of linguists (A. Goldberg 1994a, Grimshaw 1993, 1994, Hoekstra 1992, Hoekstra and Mulder 1990, S. Rosen 1993, among others), since these researchers would like to see these multiple associations effected without recourse to lexical rules. We discuss this issue at greater length in chapter 5. The approach we take here is that it is necessary to have some lexical statement indicating the patterns of multiple association between verb names and lexical semantic templates that a language allows. We show that this lexical approach makes slightly different predictions from the nonlexical approach, and our initial investigations suggest that the evidence favors the lexical approach. However, it would clearly be preferable if these lexical statements did not refer to semantic verb classes because, by hypothesis, verb classes themselves are not primitive, but are derived from the combinations of more basic lexical semantic substructures. We will show in chapter 5 that there is evidence for this, since lexical statements in terms of more basic meaning components make real predictions about the patterns of variable behavior verbs attested across languages, predictions that appear to be borne out. Although we are fairly certain that the correct approach to the lexical statements governing multiple verb classification will avoid explicit reference to verb classes, we do not develop a theory of these lexical statements, since it is beyond the scope of this book. We hope that our initial investigations of the phenomenon of variable behavior verbs will provide an impetus for further investigations.

In concluding the discussion of the relationship between verb names and verb meanings, we want to point out that there is also an important cross-linguistic dimension to the naming of verb meanings, which a full

account of this relationship cannot ignore. Languages seem to have different constraints on the kinds of verb meanings that can have morphologically simple names associated with them. This issue has been investigated most thoroughly in Talmy's (1985, 1991) work on *lexicalization patterns*, generalizations concerning the types of meaning that can be associated with the verbs of a language, whether morphologically simple or not. We will briefly discuss some cross-linguistic divergences in chapter 5 in the context of our discussion of variable behavior verbs. We hope once again that this discussion, though brief, will stimulate further research on this topic.

### 1.5 Overview of the Book

The goal of this book is to provide support for Perlmutter's hypothesis that unaccusativity is syntactically represented but semantically determined. To achieve this goal, we provide evidence bearing on both parts of this hypothesis. To show that unaccusativity is syntactically represented, we demonstrate the existence of certain syntactic phenomena whose explanation rests on the unaccusative syntactic configuration. To show that unaccusativity is semantically determined, we introduce a set of linking rules that identify the components of verb meaning that give rise to an unaccusative or an unergative classification.

We begin in chapter 2 by giving evidence for the syntactic encoding of unaccusativity. This chapter provides an extended study of one unaccusative diagnostic, the English resultative construction. In this chapter we examine the diagnostic carefully and show that the postulation of a syntactic difference between unaccusative and unergative verbs can indeed explain the difference in the way the two types of verbs pattern in this construction. We also take a careful look at the available semantic analyses of the construction and show that they cannot explain the patterns of behavior with the same success. Two more unaccusative diagnostics that we study in detail are the causative alternation in chapter 3 and locative inversion in chapter 6. In the first instance we show that there is a syntactic component to the account of this diagnostic; in the second we show that the evidence for taking the construction to be a diagnostic is not convincing.

In chapters 3 and 4 we look more closely at the lexical semantics–syntax interface as it pertains to unaccusativity, providing evidence pertinent to the semantic factors that determine unaccusativity. We argue for

the validity of the causative alternation as an unaccusative diagnostic, while providing for a lexical semantic characterization of the verbs that participate in the alternation. We show that unergative verbs that show up in causative pairs do not represent the same phenomenon as the alternating unaccusative verbs. Finally, we show that there are two major subclasses of the unaccusative verbs, which have distinct lexical semantic characterizations.

In chapter 4 we present a set of linking rules that classify verbs from the various semantic classes that we have examined as unaccusative or unergative. In this chapter we also discuss the ordering relations between these rules, and we compare the meaning components that figure in these linking rules with those that have figured in other analyses of the semantic underpinnings of unaccusativity.

Building on the results of chapters 3 and 4, we turn in chapter 5 to the problem of variable behavior verbs, a set of verbs that pose an apparent problem for the semantic determination of unaccusativity because they show characteristics of both unaccusative and unergative verbs. We show that in most instances such verbs have two distinct meanings, one associated with an unaccusative and the other with an unergative analysis, and the syntactic behavior of these verbs corresponds to their predicted classification. In this chapter we distinguish between two sources for such variable behavior.

In chapter 6 we turn to locative inversion, a purported unaccusative diagnostic, which differs from the other diagnostics considered in this book in being a surface unaccusative diagnostic. It also differs from the other diagnostics in singling out verbs of appearance and existence rather than verbs of change of state. Even more problematic, it is also found with a wide range of unergative verbs. Although some researchers have maintained that locative inversion is nevertheless an unaccusative diagnostic, we argue that the evidence for its diagnostic status is not convincing. We propose instead that it favors verbs of appearance and existence because of its discourse function. We then show that under certain circumstances, some unergative verbs can fulfill the same discourse function as verbs of appearance and existence, explaining their occurrence in locative inversion. We conclude this chapter with some speculations concerning the nature of apparent diagnostics of surface unaccusativity in general.

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## Chapter 2

### The Anatomy of a Diagnostic: The Resultative Construction

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In this chapter we investigate whether there is evidence for the syntactic encoding of the distinction between unaccusative and unergative verbs in English through a close examination of the resultative construction. We examine whether the data involving this construction are better handled by a syntactic account that relies on the syntactic encoding of unaccusativity or a semantic account that does not.

First, we review studies that show how this construction can be used to argue for the syntactic encoding of unaccusativity. These studies have shown that a unified restriction on all resultative constructions, which we call the Direct Object Restriction (DOR), can be maintained assuming an unaccusative analysis of certain intransitive verbs. We then elaborate on both the syntactic and the semantic aspects of previous analyses. We show how the effects of the DOR can be derived from a particular formulation of a familiar linking rule that maps from semantic structure to syntactic structure.

We investigate the distribution of resultative phrases and the syntax of resultative constructions based on transitive, unergative, and unaccusative verbs. A striking fact that emerges from this examination is that the syntax of the resultative construction based on verbs from these three classes is just the syntax of these types of verbs in isolation (assuming unaccusativity), except for the addition of the resultative phrase. We show that our form of the syntactic approach is preferable to the alternative set out by Hoekstra (1988, 1992), which is unable to account for this property of the construction. We also contrast the syntactic approach with two semantic analyses of the resultative construction. These semantic analyses are similar in many respects to our own analysis, which has a substantial semantic component. However, it turns out that there are certain aspects of the construction that have no obvious semantic explanation, although