Lexicalized Meaning and Manner/Result Complementarity

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Abstract: We investigate the English verbs *climb* and *cut*, cited as counterexamples to manner/result complementarity: the proposal that verbs lexicalize either manner or result meaning components, but not both. Once their lexicalized meaning is identified and distinguished from contextually determined elements of meaning, *cut* and *climb* conform to manner/result complementarity. We show that *cut* is basically a result verb, with a prototypical manner often inferred. However, as it lexicalizes a result prototypically brought about in a certain manner, some uses simply lexicalize this manner. Crucially, in manner uses, the result component drops out, consistent with manner/result complementarity. In contrast, *climb* is essentially a manner verb. Once its lexicalized manner is accurately identified and distinguished from meaning contributed by context, the upward direction associated with many uses can be shown to arise from inference. However, *climb* has some restricted uses which lexicalize a result. Importantly, on these uses, the manner component is lost. With both verbs, then, the manner-only and result-only uses instantiate different, though related, senses of the relevant verb, with each sense conforming to manner/result complementarity.

1 Manner/Result Complementarity: A Constraint on Verb Meaning?

What belongs in the meaning of a verb? Certainly, the meaning of a verb determines the range of situations in the world that it can be used to describe; however, when a verb is used in a sentence describing an event, it is only one element in that description, with other elements in the sentence contributing to the description of the event as well. How, then, can we determine what the verb contributes—that is, what is truly the verb's own meaning? It is not easy to tease the exact contribution of the verb apart from the contribution of other sentential elements such as the verb's arguments since we typically do not think of a verb outside of sentences which describe prototypical events associated with that verb. We believe, however, that it is indeed possible to distinguish facets of meaning which are strictly contributed by the verb from other facets of meaning which may be derived either by the choice of argument or from particular or prototypical uses of that verb in context. We refer to the former as elements of LEXICALIZED MEANING, taken to comprise a verb's core meaning. We suggest that the criterion for lexicalized meaning is constancy of entailment across all uses of a verb. Crucially, a verb's lexicalized meaning is to be distinguished from additional facets of meaning that can be inferred from a particular use of that verb in context and from the choice of noun phrases serving as arguments of the verb.

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The notion of lexicalized meaning can perhaps be best understood by considering an example. The verb *open* specifies a change of state that an entity undergoes, but the precise change is not fully determined by the verb itself; rather, it depends on the choice of object as well. Opening a jar or a bottle means removing its lid or cap, while opening a door or window means moving the door or window so that the aperture it is blocking is now unblocked (see Levison 1993 on opening containers vs. conduits). These variations in the precise change described, however, are not part of what is lexicalized by *open*. What this verb lexicalizes is removing an obstruction to allow access to a formerly inaccessible space, but exactly how the obstruction is removed varies depending on the actual physical object involved.

Once lexicalized meaning is distinguished from nonlexicalized meaning, it becomes possible to unify under a single sense of a verb uses which are attached to rather different real world events. If this distinction is not made, however, it may become necessary to posit considerable polysemy in the lexicon. We assume, however, that natural language tries to minimize polysemy. That is, in the default, a verb should have a single sense, and concomitantly what it lexicalizes should be kept constant across all its uses. Although this assumption may turn out to be incorrect, we believe that it is desirable to use it as a starting point because it forces us to ask whether what appear to be two distinct senses of a verb actually are two instantiations of a single sense.

Distinguishing a word's lexicalized meaning from those facets of meaning attributable to context will prove to be worthwhile if it allows the statement of generalizations inherent in the lexicon and its interfaces with other components of grammar. In this paper, we present a relevant case study. In Levin and Rappaport Hovav (1991, 2006) we make an observation about the distribution of certain types of lexicalized meaning across verbs.

(1)   MANNER/RESULT COMPLEMENTARITY: Manner and result meaning components are in complementary distribution: a verb lexicalizes only one.

In Rappaport Hovav & Levin (2010: 25), we suggest that this complementarity follows from the way roots are associated with event schemas—predicate decomposition representations of verb meanings. Specifically, we propose that a verb root can only be associated with a single position in an event schema, and since manner and result roots are associated with distinct positions, manner/result complementarity must follow.[1] We also propose that the notions of scalar and nonscalar change can be used to identify manner and result meaning components; see section 2.

In this paper, we do not explore the origins of manner/result complementarity; rather, we focus on counterexamples cited in the literature. We demonstrate how carefully distin-

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[1]On our approach manner/result complementarity emerges because manner and result roots are compatible with distinct event schema. Alternate approaches are possible. For example, Mateu & Acedo-Matellán (2011) propose that manner/result complementarity emerges from properties of the syntactic configurations roots are found in, which for them approximate what we call event schema. On this approach, the roots themselves are not classified as manner or result, a move that Mateu & Acedo-Matellán see as preferable because it avoids redundancy that they find inherent in our approach.

guishing lexicalized meaning from other facets of meaning that are determined by context is crucial to understanding how the verbs which have been cited as counterexamples to manner/result complementarity turn out not be so. In particular, we look at two English verbs, *climb* and *cut*.

In section 3, we show that when lexicalized and nonlexicalized meaning components are distinguished, *cut* turns out to be basically a result verb. The result it lexicalizes is typically brought about in a certain manner, and the verb, in some uses, lexicalizes this manner. Crucially, in these manner uses, the result component drops out. This distribution of meaning components is expected if manner/result complementarity holds, but not otherwise. We show in section 5 that this phenomenon is not restricted to *cut*. It is important to note that such manner-only uses need to be recognized as instantiations of a different, though related, sense of the verb. Thus, while our approach to distinguishing lexicalized from nonlexicalized elements of meaning allows us to unify different uses of a verb under a single sense, it also allows us to appropriately identify those instances in which a verb does indeed have more than one sense: precisely when there is no element of meaning which is constant across all uses. Although we do recognize polysemy in certain instances, it is possible to delineate the circumstances which give rise to such polysemy, thus contributing to a better understanding of just how polysemy arises.

In section 4, we show that *climb* is essentially a manner verb and the result—upward direction—said to be understood in some of its uses is not lexicalized, but is inferred due to the nature of its lexicalized manner. As we discuss, *climb*'s lexicalized manner has often been misidentified in the past; however, once its meaning is properly identified and the contribution of the context to the interpretation of particular uses is clearly delineated, it becomes clear that *climb* does not lexicalize a result along with the manner. However, just as *cut* has some uses where the manner becomes lexicalized and the result meaning component is lost, so too *climb* has a restricted set of uses in which the result is lexicalized, but with the manner component being lost. Thus, we recognize a limited degree of polysemy here as well.

2 Manners, Results and the Relation Between Them

To set the stage, we elaborate on the importance of distinguishing lexicalized from inferred meaning in the context of manner and result. A careful study of the English verb lexicon reveals that within particular semantic domains there can be verbs that describe bringing about results and others that describe carrying out activities—manners of doing. Often verbs specify results brought about using a conventionally associated manner, but do not strictly entail the manner. Similarly, the actions characterized by the particular manners denoted by other verbs are typically performed to bring about a conventionally associated result state, but the verbs do not entail this result. These points are illustrated in (2).

(2)   a.   I just wiped the table, but it's still dirty/sticky/covered in crumbs.

b.   I cleaned the dress by soaking it in hot water/pouring bleach over it/saying "abracadabra".

Since the entailed meaning is what is lexicalized and the conventionally associated meaning is not, these observations suggest manner/result complementarity is a hallmark of verb meanings.[2]

The observation that manner/result complementarity is manifested in the verb lexicon can be turned into an empirical claim only if we can provide clear and testable criteria for the notions of manner and result. In Levin & Rappaport Hovav (2006) and Rappaport Hovav & Levin (2010), we suggest that result roots specify scalar changes and manner roots specify nonscalar changes. This proposal is motivated by the observation that manner/result complementarity is most obviously manifested in two domains: change of state verbs and motion verbs. In each domain, there are result verbs—verbs denoting a change of state, as in (3a), or motion in a specified direction, as in (3b).

(3)   a.   break, crack, fill, empty, melt, open, shatter, . . .

        b.   arrive, come, enter, exit, fall, go, rise, . . .

In each domain, there are also manner verbs. In the change of state domain, these verbs denote activities that might, but need not be used to bring about changes of state, while in the motion domain, they describe manners of motion that might, but need not be used to bring about displacement in a particular direction, as in (4).

(4)   a.   hit, kick, pour, shake, shovel, slap, wipe, . . .

        b.   amble, crawl, hop, jog, limp, run, swim, walk, . . .

In Levin & Rappaport Hovav (2006), Rappaport Hovav (2008) and Rappaport Hovav & Levin (2010), we suggest that the semantic notion which unifies directed motion and change of state is scalar change. A scalar change in an entity involves a change in the value of one of its attributes in case these values form a scale: a set of degrees—points or intervals indicating measurement values—ordered on a particular dimension (e.g., cost, length, temperature; Kennedy 2001). Result verbs, including directed motion verbs, denote events of

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[2]We distinguish between what we term a verb's 'contextually associated' meaning and its 'conventionally associated' meaning. We use the first term to refer to those elements of a verb's meaning that are understood from its use in a particular sentence, derived from the specific arguments it takes in the sentence and also from the more general discourse context in which the sentence is used. We intend the second term to refer to those inferences that are associated with a sentence using that verb outside of any particular context. A verb's conventionally associated meaning is essentially that represented by a prototypical instance of the event described by the verb, such as opening a can opener with a can-opener rather than, say, by poking holes around the top with some sharp-bladed instrument or cleaning a floor with a broom or mop rather than, say, by reciting a magic spell. As Rosch (1978:43) points out, prototypes are essentially a reflection of our default expectations in a particular context. Thus, the two notions "conventionally associated" and "contextually associated" are ultimately related.

scalar change and lexically entail an associated scale (e.g., Beavers 2008, Borer 2005, Hay, Kennedy & Levin 1999, Kennedy & Levin 2008, Krifka 1998, Ramchand 1997, Rappaport Hovav 2008, Tenny 1994). With directed motion verbs, the contiguous points making up the path of motion constitute a scale, with the ordering relation defined by the direction of motion; the order can be fully lexicalized in the verb, or determined in conjunction with an external reference point. Scalar change can be contrasted with nonscalar change, which does not involve a directed change or ordering relation; manner verbs lexicalize nonscalar changes. Manner/result complementarity, then, becomes a claim that the lexicalization of a scalar change is in complementary distribution with the lexicalization of a nonscalar change; see Rappaport Hovav & Levin (2010) for further discussion.

3   Putative Counterexamples to Manner/Result Complementarity

Despite the pervasiveness of manner/result complementarity, apparent counterexamples are raised in the literature (Cifuentes Ferez 2007:122, Goldberg 2010:48-49, Koontz-Garboden & Beavers 2010, Mateu & Acedo-Matellán 2011, Zlatev & Yangklang 2004:167-168). They call into question whether manner/result complementarity is indeed the consequence of a lexicalization constraint, rather than just a tendency regarding verb meanings. Space considerations prevent us from dealing with all the counterexamples that have been mentioned in the literature.[3] Rather, we now carefully examine two distinct counterexamples. In the next section we examine a potential counterexample from the change of state domain, the English verb *cut*, and in the following section we examine a potential counterexample from the directed motion domain, the English verb *climb*. In each instance, we suggest that distinguishing between lexicalized and contextually derived meaning provides the appropriate basis for understanding the behavior of the verb.

4   A Potential Counterexample from the Change of State Domain

Guerssel et al. (1985) and Levin (1993:8) provide the verb *cut* with a meaning which includes both manner and result meaning components. If the definition they suggest is accurate, then the verb constitutes a counter example to manner/result complementarity. Intuitively, this suggestion makes sense as the event described involves the production of an incision with clean edges, which requires the use of an appropriate instrument, which is usually manipulated in a particular way. To capture this insight, Guerssel et al. propose that

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[3]In particular, Koontz-Garboden and Beavers (2010) argue that verbs of cooking and verbs of manner of death represent counterexamples to manner/result complementarity. Nevertheless, we believe that they do not adequately distinguish between what the verbs lexicalize and what listeners know from the use of these verbs in context, though this is necessary to fully resolve the status of these verbs. Our own sense is that the verbs in both classes are somewhat heterogeneous, containing both manner and result verbs, as well as a few verbs, which are polysemous, with distinct manner and result senses, as we argue here for *cut* and *climb*. In fact, Arsenijević (2010) presents arguments that verbs of manner of death do not counterexemplify manner/result complementarity.

the lexical conceptual representation for the verb *cut* is as in (5).

(5)　　*cut* LCS: x produce CUT on y, by sharp edge coming into contact with y
　　　　(Guerssel et al. 1985:51, (11))

　　　Several types of evidence can be cited to support the claim that *cut* is a result verb. First, its zero-related nominal, *a cut*, refers only to a result, a property *cut* shares with other result verbs, as in (6). In contrast, nominals zero-related to clear manner verbs, as in (7), lack a result interpretation; they necessarily refer to the action and not the physical result of the action, which can be perceived in some instances, but only after the action is over.

(6)　　break$_V$/a break$_N$, crack$_V$/a crack$_N$, split$_V$/a split$_N$

(7)　　(give it) a wipe, (give it) a kick, (go for) a walk/run

Nevertheless, there is also reason to claim that *cut* is a manner verb. It is found in the conative construction, as in (8)—a property it shares with manner verbs, such as those in (9a), but not with result verbs, such as those in (9b).

(8)　　a.　　Finally, she got the blade pulled out and started **cutting at** the tape on Alex
　　　　　　　. . . (www.authorhouse.com/BookStore/ItemDetail∼bookid∼28127.aspx)

　　　　b.　　It had been a stupid act on her part, I thought to myself as I **cut at** the rope
　　　　　　　with my knife, aware that Sarnian Lady was sinking further . . .
　　　　　　　(www.etext.org/Fiction/Warlady/unzipped/warlady-2/2565-62)

(9)　　a.　　claw, hit, kick, pull, splash, . . .

　　　　b.　　bend, break, crack, shatter, split, . . .

Furthermore, *cut* is frequently cited as lacking anticausative uses, a property typically exemplified with sentences such as (10a). However, a majority of result verbs show anticausative uses, as in (10b), although such uses are never found with verbs with clear manner components of meaning, as in (10c).

(10)　　a.　　∗ The cake cut. (cf. The waiter cut the cake.)

　　　　b.　　The window broke. (cf. The boy broke the window.)

　　　　c.　　∗ The table wiped. (cf. The waiter wiped the table.)

　　　Taken together, the evidence cited suggests that *cut* lexicalizes both manner and result. Nevertheless, we argue that *cut* does indeed conform to manner/result complementarity: it lexicalizes a notion of result in most uses, but has some uses where it lexicalizes a notion of manner; thus, we claim it lacks uses which simultaneously lexicalize both manner and result. If we are correct, then, any single use of *cut* meets the lexicalization constraint.

Our discussion will also clarify the conditions which give rise to a verb which has uses lexicalizing different meaning components.

First, we show that in its basic use *cut* lexicalizes only a result—a clean separation—despite the evidence cited above that it lexicalizes manner. Our strategy is to show that the manner component is inferred and not lexicalized. Although a cutting event is usually understood as being brought about by the use of a sharp-edged instrument, this perception is due to the nature of the lexicalized result state; the instrument is not lexicalized in the meaning of the verb.[4] An examination of cutting events shows that *cut* specifies neither the instrument, nor the action that the instrument is involved in; specifically, an agent need not wield the instrument. This insight is reflected in Bohnemeyer's discussion of the meaning of *cut* and similar verbs:

(11)   "Cut verbs, too, are rather flexible about the action performed and the instrument used (I can *cut* an orange using anything from a knife or axe to a metal string or laser beam, and I can do it by bringing the blade to bear on the fruit or by dropping the fruit onto the blade from sufficient height)." (Bohnemeyer 2007:159)

What emerges from this quote is that the verb supports a wide range of actions on the part of the agent in performing an event of cutting.[5] As mentioned, a hallmark of manner verbs is their lack of anticausative uses, and indeed, *cut* usually is not found in anticausative uses. However, despite received wisdom such uses may be found, as in (12).

(12)   a.   . . . the rope **cut** on the rock releasing Rod on down the mountain.
             (http://www.avalanche-center.org/Incidents/1997-98/19980103a-Montana.php)

        b.   The sheath of the rope had **cut** on the edge of the overhang and slid down 2 feet. (www.rockclimbing.org/tripreports/elnino.htm)

        c.   The rope cut and the climber landed on his feet, stumbled backward and fell . . . (http://rockandice.com/articles/how-to-climb/article/1092-rope-chopped-by-carabiner)

        d.   Suddenly, the rope **cut** and he fell down the well.
             (http://www.englishforfun.bravehost.com/wishingwell.htm)

Most likely, the anticausative uses of *cut* were overlooked as most instances of cutting such as those involving food—the patient in most linguistic examples—violate a constraint on anticausatives: the event must happen without the agent's continued involvement (Haspelmath 1993, Levin & Rappaport Hovav 1995, Rappaport Hovav & Levin in press).

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[4]A reviewer asks whether *cut* does lexicalize manner, proposing that otherwise there is no way to distinguish a cut entity from a torn one. We disagree. We believe that the actions denoted by two verbs give rise to distinct results: that is, it is possible to tell a cut edge from a torn one. Consider, for instance, a piece of bread that is cut from a loaf and a piece that is torn from a loaf.

[5]In this respect, *cut* contrasts with verbs which really lexicalize an instrument and not a result, such as *knife*, *rake*, and *shovel*.

(13)　∗ The bread cut. (cf. The waiter cut the bread.)

As we elaborate in Rappaport Hovav & Levin (in press), the conditions allowing an anti-causative use of a verb are not determined purely by its lexical properties, but also depend on properties of the event described in a sentence with the verb. Drawing on this study, we propose that (13) is not ruled out due to lexical properties of *cut*, but rather because it is not an appropriate description of an event in which bread is cut. That is, the verb itself does not specify the particular kind of action which brings about a cut; rather, this action is more or less dictated by the choice of argument as direct object. An anticausative use of *cut* is available precisely when the event involves a theme which can be cut without requiring the continued involvement of an agent. Most often, such instances involve a taut rope-like entity which snaps (cuts) with a clean separation under extreme tension. Since such uses of the verb need not involve the activity of an agent at all, there is certainly no manner component: the verb's meaning involves only a notion of result.[6]

Summarizing, we have shown that in its basic use, the verb *cut* lexicalizes a result. For this reason, it has a result meaning for its zero-derived noun, like other result verbs, is compatible with a range of actions on the part of the associated agent, and can display an anticausative use with the right choice of argument. Therefore, the specifications of manner which are understood with result uses of the verb do not arise from the lexicalized meaning of the verb, but rather are inferred from context.

Although we have argued that in its basic transitive use *cut* does not strictly lexicalize a manner, some instances of this verb necessarily involve a particular manner. It is striking, however, that in such examples, the verb does not entail any result. This happens when the verb is in the conative construction, as in (14). This and comparable examples crucially do not entail a result, but simply the handling of a sharp-bladed instrument in the way necessary to fulfill its intended use.

(14)　　Flint virtually forgot the two whales as he **cut** at the net with increasing fury. (M. Harris, "Gray Whale Cove", *Orange Coast Magazine*, March, 1990, p. 148; http://books.google.com/)

In examples such as these, there is no entailment that a cut was actually made, though the sentence may be used to describe such a situation.

In fact, studies of the conative construction propose that it is licensed by motion and contact meaning components (e.g., Goldberg 1995:63-64, Guerssel et al. 1985:59, Levin

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[6]As a reviewer notes, the (a) and (b) sentences in (12), which were the only examples cited in an earlier version of this paper, include PPs specifying a sharp edge, which cuts the rope. Although the preponderance of examples involving ropes and comparable entities involve such PPs, some examples lack them, such as those cited as the (c) and (d) sentences of (12). Such PPs are occasionally found with more prototypical causative alternation verbs, such as *break* in *The stick broke against the rock*; however, it seems that such PPs do not have to be expressed or even implied with *break*, as they are with *cut*. We have also found anticausative uses of *cut* with the XP *loose*, as in *The tow rope cut loose*. We leave further investigation of the factors licensing such anticausative uses and their significance for future research.

and Rappaport Hovav 1991:135, van der Leek 1996)—i.e. some type of manner—and, indeed, as just mentioned, in the conative *cut* entails handling a sharp instrument in a particular way. Although as cited above, Bohnemeyer (2007:159) notes that *cut an orange* can be used when "dropping the fruit onto the blade from sufficient height", this scenario, which does not involve actually wielding as instrument, cannot be described by *cut at an orange*, even if an orange were repeatedly dropped. Thus, the conative uses of *cut* are consistent with the lexicalization constraint: they involve a specific manner—motion and contact—but not a result meaning component.

Thus, we suggest that *cut* has a manner use and a result use, with no meaning component constant across both. Crucially, as our examination of the conative examples shows, when *cut* encodes the manner, the result is no longer entailed, as predicted by the lexicalization constraint.[7] Equally significant, to date our corpus investigations of conative uses of *cut* have not uncovered any examples where the action of cutting is carried out by a machine. It seems to us that a machine can "cut at" only if it is designed to perform the same form of motion and contact that a person does.

What allows *cut* to have a manner use? We suggest that it is so strongly associated with a particular way of handling a specific type of instrument that it is sometimes used to encode a manner. Prototypical cutting events involve instruments such as knives and scissors, which are associated with a specific type of action when they are manipulated. When there is a tight association between a result and the manner in which it is brought about, the relevant result verb may take on a second, manner sense.

Summarizing, the verb *cut* is associated with a conventional manner of bringing about the result it lexicalizes; consequently, it can lexicalize the manner, giving rise to a new sense associated with this word. When this happens, the result meaning component drops out, and the verb can then appear in the conative construction. That the manner is entailed only when the result component of meaning drops out is strong evidence for the manner/result complementarity hypothesis.

5   A Potential Counterexample from the Motion Domain

An even more widely discussed potential counterexample to manner/result complementarity exists in the motion domain: the English verb *climb*. It has been claimed that this verb expresses both manner ('clambering') and direction ('upward') in some uses (Fillmore 1982:32, Jackendoff 1985). Thus, in (15), Kelly is understood to be using her limbs to pull her body upward along the trunk of the tree.

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[7]A question that arises is whether there are transitive uses of *cut* which illustrate its manner sense. A reviewer suggests that *Terry cut a hole in the ice* might exemplify such a use. In fact, in this example the object is not nonsubcategorized by *cut*, a property which we take to be a hallmark of manner verbs (Rappaport Hovav & Levin 1998). We leave it for future research to determine whether this example truly instantiates a transitive manner use. If such uses turn out not to exist, their absence will need an explanation.

(15)   Kelly climbed the tree.

Despite the example in (15) in which manner and direction appear to be jointly entailed, Kiparsky (1997:490) argues, as we do, that particular uses of the verb *climb* lexicalize only one meaning component—either manner or direction. He formulates a lexicalization constraint similar to ours in (1), and as support for it, he notes that *climb* displays what he calls "disjunctive meaning": although the concept of climbing includes both a notion of direction ('upward') and a notion of manner ('clambering'), any single use of the verb involves only one of these. As an illustration, he gives (16), claiming that in (16a) only manner is lexicalized and in (16b) only direction is lexicalized.

(16)   a.   John climbed down the mountain.

         b.   The train climbed up the mountain.

In (16a) not only is the direction specified outside of the verb, but this direction is downward; therefore, unlike in (15), upwardness cannot be part of the verb's meaning in this example, suggesting that here direction is not lexicalized in the verb. Further support is provided in (17), where still other directions are expressed outside the verb.

(17)   a.   Kelly climbed through the gap in the hedge.

         b.   Pat climbed under the wire fence.

As trains are inanimate, they lack the limbs needed to clamber; thus, *climb* must lexicalize direction only in (16b). Such direction only uses would set this verb apart from most other manner of motion verbs (e.g., *crawl, jog, limp, ride, run, swim, trudge*). Further evidence that in some instances *climb* must contribute direction comes from examples as in (18).

(18)   a.   The plane/elevator climbed.

         b.   Smoke climbed slowly and the falling sun was coloring it through . . .
                (books.google.com/books?isbn=0595002692)

As Jackendoff (1985:275) notes, despite the lack of an overt indication of direction, the motion in these examples is still understood as upward, and, again, planes, elevators, and smoke, like trains, lack the limbs needed to clamber.

Although there are undoubtedly manner-only and direction-only uses of *climb*, any account of this verb must deal with sentences such as (15), in which manner and direction appear to be jointly entailed. Kiparsky does not make reference to such sentence types in arguing for disjunctive meaning, though others have used such sentences to argue against manner/result complementarity (Fillmore 1982:32, Jackendoff 1985:274-279). Therefore, we examine *climb* more closely in an attempt to account for all the sentence types.

We will, as mentioned in section 1, argue that a closer examination of *climb* suggests that in its basic use this verb lexicalizes manner and not direction, and, furthermore, that the lexicalized manner is not 'clambering', but rather, as Geuder & Weisgerber (2008) argue, 'force exertion against gravity'. Given this reidentification of the manner, we argue that the examples in (16b) and (18), though purported to lexicalize direction only, actually lexicalize manner only. Again following Geuder & Weisgerber, we argue that in (15), the verb lexicalizes manner and not direction as well. Like them, we claim that the nature of the lexicalized manner allows it to be associated with a default direction of motion. It is this association, most likely, that has made it difficult to determine precisely which meaning components are lexicalized in some uses of *climb*.

Finally, we point out in section 5.4 that previous work has been correct in identifying uses of *climb* that lexicalize direction only, but we propose that they are the uses found in sentences like *The temperature climbed*. As we discuss, these uses represent the inverse of the phenomenon illustrated with *cut*: *climb* basically encodes a manner, which has a contextually determined direction; consequently, it can acquire a second use in which the default direction is lexicalized and the manner is not.

5.1 The Manner Lexicalized by *climb*

Fillmore (1982:32) and Jackendoff (1985:276) describe the manner that *climb* lexicalizes as 'clambering': using the hands and feet to propel one's body. Since this manner involves the limbs, uses of *climb* predicated of either animate or inanimate entities that lack limbs should lexicalize direction, i.e. upwardness, only. This prediction is taken to explain the contrast in (19).

(19) a. The train climbed.

  b. ?? The train climbed down the mountain.

  (Jackendoff 1985:278, (14a), (15a))

Upward direction is understood in (19a) because direction is lexicalized, and since it is upwardness that is lexicalized, it cannot be denied, explaining the unacceptability of (19b).

However, as Geuder & Weisgerber (2008; Geuder 2009) point out, there are uses of *climb* with a downward direction expressed outside the verb that are predicated of inanimate entities lacking hands and feet and, thus, unable to clamber.

(20) Before noon the train **climbed** down to a green valley which contained a cluster of Swiss chalets . . . (www.accessmylibrary.com/.../albuquerque-n-m-homeowner.html)

(21) By the time the ATC informed them about the altitude of the Boeing, the plane had **climbed** down to 14496 feet. (skyscrapercity.com/archive/index.php/t-143494-p-2.html; cited in Geuder & Weisgerber 2008)

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(22)   Once the bus **climbed** down the ghat, we all were in the Kokan region and few kilo-
metres away is Chiplun. (cablog.rediffiland.com/blogs/2006/08/23/Guhagar-.html)

Our own explorations suggest that sufficient examples of this kind are attested that they
need to be included in any analysis of *climb*.

Since the direction is specified as downward in such examples, and this direction is
not compatible with the direction that the verb is purported to lexicalize, Geuder & Weis-
berger suggest that even with inanimate themes, *climb* can lexicalize a manner. If so, the
characterization of the manner cannot, as Fillmore and Jackendoff suggest, involve a partic-
ular movement of limbs. Rather, these examples support Geuder & Weisberger's proposal
that the manner is 'force exertion against gravity'.[8] On this analysis, when the motion is
downward, *climb* is still applicable if there is "the presence of an upward force on certain
points of the path", manifested in "controlled, stepwise descent" (Geuder & Weisgerber
2008:26). That is, in these instances, climbing is what allows downward movement without
falling. This characterization of the manner component of *climb*'s meaning better captures
the actual range of uses of this verb, including its applicability to certain types of down-
ward motion: these uses, like the upward uses of *climb*, require motion that resists the pull
of gravity.

If *climb*'s meaning encodes a manner which allows movement via force exertion in or-
der to resist the pull of gravity, it lexicalizes neither clambering, nor upward movement.
Rather, since the prototypical climbers are animates (humans and mammals), the prototyp-
ical instantiation of the manner is clambering. Clambering is the way in which humans
move when they are in physical contact with a reference object and trying to move along it
against the pull of gravity.[9] This prototypical instantiation has been taken to be the man-
ner that *climb* lexicalizes. Mammals like cats and squirrels, which use their limbs to move
upward along some object against gravity, also are said to climb. More important, even
animals that lack limbs can also *climb* as long as they are able to move along a surface in
a manner that exerts a force against gravity. Thus, despite Fillmore's (1982:32) claim to
the contrary, snails can indeed climb, as in (23), and, in fact, there is even research into the
climbing behavior of snails (McBride & Henry 1989).

(23)   a.   ... it seems the snail **climbed** up the side of the tank ...
               (www.aqua-fish.net/show.php?h=siamesefightingfish)

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[8]A more precise characterization of the manner may be in terms of resistance to an ambient force, because
it is possible to come up with examples set in space, say, where gravity is not at issue, as in *After the space
walk, the astronaut climbed back into the space capsule*. Sometimes notions of effort and slowness have also
been said to be part of *climb*'s manner. We believe these notions are not part of the verb's entailed meaning,
but are contextually understood, perhaps because exerting a force against gravity is effortful and may require
moving slowly and with difficulty.

[9]Mateu & Acedo-Matellán (2011) argue that these uses are not manner uses based primarily on data from
Catalan and Dutch. We are reluctant to draw a conclusion about English based on data from another language
since there could be subtle but crucial differences in meaning between purported translation equivalents; see,
for example, McClure's (1990) discussion of the Italian and Dutch translation equivalents of English *blush*.

      b.   Is it possible that the snail **climbed** the greenhouse and dropped down, by-
            passing your copper tape? (forums.moneysavingexpert.com/.../t-974821.html)

Because the motion is understood as upward in the examples in (23), it could be argued that in them *climb* lexicalizes upward motion only and not a manner; however, there are also examples where snails climb in directions other than upward, as in (24).

(24)   a.   At the completion of mating, the snails separated, the top snail **climbed**
             down and the snails crawled away from each other. (home.earthlink.net/∼aydinslibrary2/Orstan2010.

      b.   As this snail **climbed** down, his shell was pulling him.
             (http://www.flickr.com/photos/phoo_tographer/page9/)

      c.   Watch this crazy **snail** climb across the tops of my plants, and bend them
             over to the glass . . .
             (www.aquaticcommunity.com/aquariumforum/archive/.../t-20939.html)

These examples show without a doubt that *climb* in its manner use can be predicated of entities which lack arms and legs.

Furthermore, machines such as cars, planes, and elevators can all be said to climb in that they are designed to move against the force of gravity because of their engines and possibly other design features; however, since they do not have limbs, they do not instantiate such motion by clambering. Yet another example noted by Geuder & Weisberger is a balloon, which can climb because being lighter than air its buoyancy exerts an upward force. Thus, although it is possible to identify a unified manner across the range of themes found with *climb*, as Geuder & Weisberger also point out, this manner is instantiated in various ways because each type of theme has its own way of exerting a force against the pull of gravity. The many apparent instantiations of climbing can be likened to the many instantiations of opening; as we noted in section 1, the result state that constitutes being open depends on what is being opened.

5.2   Where Does the Inference of Upwardness Come From?

If *climb* indeed lexicalizes manner in uses previously said to lexicalize direction, why is it that an upward direction is understood in so many uses of *climb*—perhaps so strongly that it explains why *climb* has been said to lexicalize direction? The reason, we propose, is that there is a default association of this manner and upward direction.

Geuder (2009:132) elaborates on this, noting that there is a directional meaning component associated with *climb*'s manner, independent of the overall direction of displacement of the theme. As he writes, the manner involves "a force oriented vertically and opposed to gravity" (Geuder 2009:132; translated from French by BL). Further, as Geuder continues, "*climb* in an upward direction can designate a continuous movement (because the displacement always accords with the manner), while the process designated by *climb* in a downward direction must take place in stages (because a section of a descent must be inserted

between each pair of points of contact with vertical support)" (2009:133; translated by BL). It is this difference that is behind the inference of upwardness in the absence of contextual cues to the contrary. The presence of an upward force in *climb*'s manner is consistent with movement in an upward direction, though context may provide evidence that the motion is in some other direction. Thus, in (25a) motion on a jungle gym (or monkey bars) is in just about any direction, while in (25b), the motion need not be upward, but simply over a rugged terrain requiring the relevant manner of motion.

(25)   a.   The children climbed on the jungle gym all afternoon.
        b.   The backpackers climbed all day.

5.3 Transitive *climb* Does Not Lexicalize Direction

Having clarified the nature of *climb*'s manner component of meaning, we turn now to the transitive uses of *climb* such as in (15), repeated as (26), which must be understood as describing a scenario that involves both a clambering manner and upward motion. Indeed, as noted, the verb *climb* has been said to lexicalize both manner and direction in such examples.

(26)   Kelly climbed the tree.

The question, then, is whether such examples are truly a problem for manner/result complementarity? We propose that the transitive uses of *climb* ONLY lexicalize manner, where the manner again is force exertion against gravity. We suggest that the understood direction of motion in transitive uses arises contextually from the interaction of the manner, the nature of the reference object (e.g., the tree in (26)), and the intention of the agent. As we show, the understanding of a particular direction of motion associated with uses of *climb* with a reference object is just one instance of a more general phenomenon attested with manner of motion verbs taking reference object and agent arguments.

If the upward direction understood in (26) were attributable to the verb, then every instance of transitive *climb* should also be understood as involving upward motion, no matter what the reference object. However, although the direction of motion is understood as upward in (26), it is clearly not so in all transitive uses of *climb*. This means that the upward direction must not be lexicalized in (26), but rather must arise from the context. In the next two examples, the context makes clear that the direction in which the climbing takes place must be downward.

(27)   According to his story, he had trailed the Mexicans and from a place of concealment had watched them **climb** a rope ladder into a chasm. He saw them haul up sacks of ore, and water for their horses, which were staked on the rim. (J.F. Dobie, *Coronado's Children: Tales of Lost Mines and Buried Treasures of the Southwest*, University of Texas Press, Austin, TX, 1978, p. 234-235; books.google.com/books?isbn=0292710526)

(28)   'Bring the Governor's reply straight back,' shouted Master Mace as Mungo **climbed**
         the rope ladder into the ship's rowing boat. (J. Riordan and B.K. McCalla, *Rebel
         Cargo*, Frances Lincoln, London, 2007, p. 149; books.google.com/books?isbn=1845077741)

In (27), the narrator is located at the top of a chasm, watching the Mexicans move down
into it and then carry things up from it. In (28), Master Mace is on a ship, and he is sending
Mungo down to a smaller boat. The preposition *into* does not contribute information about
direction in either (27) or (28). In fact, *into* is found with both downward motion into a ship
as in (28) and upward motion into a ship as in (29).

(29)   Marian **climbed** the rope ladder into the ship unaided, and was back on board within
         15 minutes of jumping. (www.geocities.com/jckinghorn/ATL/content/56Minnekahda.htm)

Why does the understood direction vary in transitive sentences with *climb* as the di-
rect object is varied? We propose that this variation follows from properties of the direct
object—i.e. the reference object—and in particular, the way in which agents typically in-
teract with this object. In general, a reference object defines a salient path via its inherent
nature and the way an agent typically interacts with it, and this determines a default direc-
tion in any interaction with this reference object when it is part of the agent's path of motion.
Thus, a significant factor in the absence of a downward interpretation for *climb the tree* is
the nature of our interactions with trees. Trees have a prominent vertical dimension: they
are perceived as projecting upward from the ground, so they are typically encountered as
something to ascend, especially because they might contain fruits or provide a haven from
danger. In contrast, cliffs may be encountered either projecting upward or downward from
ground level. Evidence for these different perceptions comes from searches of the World
Wide Web. Although these numbers are only approximate, with *the/a tree*, there are over
12 times more *climb(ed) up* than *climb(ed) down* in October 2008. With *the/a cliff*, there
are considerably less total examples, with slightly more *climb(ed) up*.

These distributional observations lead us to expect that if circumstances conspire, down-
ward transitive uses of *climb* might be attested, and indeed they are, as the examples in
(27) and (28) show. Interestingly, examples of downward motion with transitive *climb* can
cooccur with *down* without seeming contradictory, suggesting that the sense of upward
movement in *climb(ed) the/a ladder* is due to a very strong inference.[10]

(30)   You **climb** the ladder down into the crew quarters, and encounter a Protagonist,
         lying on a cot and brooding.
         (kol.coldfront.net/thekolwiki/index.php/Random_Lack_of_an_Encounter)

In contrast, there are only a handful of comparable *down* examples with *climb(ed) the/a
tree*, suggesting that this reference object is interacted with differently.

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[10]A reviewer questions the acceptability of these examples and wonders if there are dialectal differences or
changes in the usage of the verb *climb*. Determining this is beyond the scope of this paper; what matters here
is that such uses do exist for at least some speakers.

(31) a. Once a mother came with three or four of her babies and one was stuck on the roof since it was too afraid to **climb** the tree down to join the others ... (artizek.deviantart.com/art/Racoon-39425624?offset=0)

  b. We don't know if it was cut to take Glen's body down or if a police officer, homicide detective or investigator climbed the tree or had someone **climb** the tree down to remove the entire rope. (http://crimeshots.com/forums/showthread.php?t=6334)

Finally, to further illustrate that the direction of motion does not arise from the verb alone, we cite examples of transitive *climb* where the understood direction is 'across'. Various web pages explain how to climb monkey bars (or jungle gyms). For example, the web page "How to Climb Monkey Bars" (http://www.ehow.com/how_6575386_climb-monkey-bars.html) provides instructions for moving along "a series of bars in a row that are meant to be swung on, going across, under the bars, from one to the other".

Our analysis has the advantage that it is not tailored specifically to the verb *climb*. Thus, it also explains the behavior of other manner of motion verbs: when they take a reference object as direct object, the direction of motion again depends on the nature of the reference object and how the theme interacts with it. This point is not usually appreciated because a limited set of reference objects is commonly cited, suggesting that there is a single, default direction understood with each verb (e.g., Jackendoff 1985: 277). Thus, *hike* and *ride* are said to be associated with motion along a predefined path, as in (32a), while *swim* is said to be associated with motion across, as in (32b).

(32) a. hike/ride the Appalachian trail
  b. swim the Channel

But other directions may be understood with these verbs with alternative choices of reference object. Even though (33) and (34) involve the same verb, *ride*, and the same reference object, *the slope*, the larger context indicates that the direction is DOWN in (33) and UP in (34)—neither of which is the default 'along' of (32a).

(33) He was descending a hill of a four-lane arterial, on a bicycle equipped with the all-reflector system of nighttime protection that is required by federal regulation, but not using a headlamp. ... I testified to two accurate ways to determine speed on a slope. The first is plain experimentation. **Ride the slope** and see what speed develops. (http://johnforester.com/Consult/GreenJM/derby.htm)

(34) ... the cart inched up the winding slant of the hill. ... Martin **rode the slope** glancing at the sky, watching the double file of muscle-legged beasts lean straining with the cart against the long incline. (T. Lea, *The Wonderful Country*, TCU Press, Fort Worth, TX, 2002, p. 178; books.google.com/books?isbn=0875652557)

The verb *ride* differs from *climb* in that its manner does not so strongly give rise to an understood default direction of motion; most likely, this explains the wider variety of understood directions in its transitive uses.

Finally, the verb *scale*, which Goldberg (2010:48) suggests lexicalizes both manner and upward direction, just as *climb* has been said to, shows a downward transitive use with *cliff*.

(35)   A woman escaped with minor injuries after her car plunged over cliffs in East Sussex and landed on a ledge. …The vehicle landed almost vertically on the ledge about 100ft down from the top of the cliff with the woman inside. A coastguard team **scaled** the cliff to reach the woman who was then winched to safety and taken to hospital.
(http://news.bbc.co.uk/1/hi/england/southern_counties/3691952.stm)

Although the relevant manner is again intended for motion against the pull of gravity over typically vertical surfaces, (35) shows that the motion need not be upward. With this verb, too, direction is not lexicalized in the verb, but inferred in part from context.

5.4   The Direction-Only Use of *climb*

Among the purported direction-only uses of *climb*, Jackendoff (1985:278, (14d)) includes *The temperature climbed (to 102 degrees)*. We agree that in this use and comparable uses in (36), the verb indeed lexicalizes direction only.

(36)   a.   The prices/cost climbed.

        b.   Despite the new measures, the inflation/unemployment rate climbed.

        c.   During the recession, the number of foreclosures climbed.

As these examples involve abstract themes, no manner component is possible at all. What is striking is that the themes are all measurable attributes of entities whose values form a scale—in these instances, a set of points representing the possible values of the attribute arranged according to an ordering relation (Kennedy 2001, Kennedy & McNally 2005). Since these attributes are scalar-valued, a change in their value can be understood as motion along the scale. Thus, when they are arguments of a verb such as *climb*, the upward direction associated with *climb* is understood figuratively, translating into an increase in the value of the relevant attribute along its associated scale. In these uses, then, *climb* acquires a use that indicates motion in an upward direction (figuratively), but only with a concomitant loss of the manner component, consistent with manner/result complementarity.

In this direction-only use, *climb* patterns very much like the inherently directed motion verb *rise*, which may also be used to describe a change in an increasing direction along a scale; see Geuder & Weisberger (2008:33-37) for further discussion of similarities and differences between the two verbs.

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(37)   The prices/temperature climbed/rose.

We suggest that the existence of the direction-only meaning of *climb* can be explained in the same general way as the manner-only meaning of *cut*.[11] Just as in its basic meaning *cut* encodes a result and has a conventionally determined, but non-lexicalized manner, so *climb* basically encodes a manner, which brings with it a default direction. Furthermore, just as there is a second meaning for the verb *cut* in which the conventionalized manner is lexicalized, but only if the result meaning is not, so too with *climb*, there is a second use in which the default direction is lexicalized, but then the manner meaning is not. Importantly, each meaning of both verbs shows manner/result complementarity, conforming to the lexicalization constraint.

6   Potential Counterexamples Are Systematic, Even if Sporadic

If some facets of the behavior of *cut* and *climb* are a consequence of manner/result complementarity, we expect to find at least some other verbs which pattern like them. That is, we should find some verbs which lexicalize results that are conventionally brought about in a specific manner and hence also have uses which lexicalize only the manner, and also some verbs which lexicalize manners that are conventionally associated with a specific result (or direction) and hence also have uses in which only the result is lexicalized.

We illustrate the existence of such verbs with another verb that patterns like *cut*: the English verb *slice*. It too is basically a result verb, and like such verbs, it has a zero-related result noun. The verb *slice* differs from *cut* in that the noun *cut* names a type of separation in an entity, while the noun *slice* names a piece of matter that becomes separated with a characteristic result shape. What matters here is that a slice, like a cut, is brought about through a well-defined use of a specialized instrument, though neither the specific instrument, nor the action used in wielding it is lexicalized by the verb. Yet, the verb *slice*, like *cut*, can appear in the conative construction. In such uses, the result need not be entailed, and, in fact, in the context in (38) it is impossible to conceive of a slice being created at all.

(38)   She ... was **slicing** at the tape that held his legs ...
         (books.google.com/books?isbn=0060541075)

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[11]If climbing is so strongly associated with upward movement, then it might be expected to be associated with upward movement without clambering for animates, just as *cut* is associated with either a result only or a manner only for the same choice of argument. Although this might be attributable to a lack of conventionalization, there might be other reasons why this has not happened. There could be a blocking effect given the existence of inherently directed motion verbs like *rise* and *ascend*, which lexicalize upward motion. It may also be easier for a meaning to shift from result to manner than from manner to result: an entity that ends up in a result state plays a large part in determining the manner in which the state is achieved, but the theme of a motion event does not restrict its final destination to the same extent. Even with the verb *climb*, although it may be inferred that the theme moves, the actual goal of movement cannot be inferred, especially in the absence of a reference object.

The conative example must be understood as involving an agent using a knife-like instrument in the same way as when slices are cut. Thus, if the action was performed with scissors, then it would be understood as involving a single blade of the scissors used like a knife. Furthermore, the conative would not be used, say, if the agent were using a bread-slicing machine, which does not replicate the pattern of actions that a person makes in slicing. Thus, *slice* behaves like *cut*, which cannot be found in the conative construction use when the action is carried out by a machine. Thus, in the conative use of *slice* a manner is lexicalized, but the result drops out. Presumably, the manner use arises because an event of slicing, like an event of cutting, is conventionally associated with a particular manner.[12]

Summarizing, *slice*, like *cut*, is strongly associated with a conventional manner of bringing about the result it lexicalizes; consequently, it can lexicalize the manner, with the result meaning component dropping out, and appear in the conative construction. That the manner is entailed only when the result component of meaning drops out is strong evidence for the manner/result complementarity hypothesis.

Similarly, if there are manner of motion verbs, which are like *climb* in that the very nature of the manner they lexicalize gives them a strong conventional association with a particular direction of motion, then they might be expected to show result uses with the manner dropping out. In fact, there are verbs, which like *climb*, involve manners that facilitate motion either with or against gravity, such as *plunge* and *soar*. Again when such verbs are predicated of scalar-valued attributes, they show result meanings, as in *The prices plunged/soared*.

7   Concluding Words: The Lesson from the Problematic Verbs

An examination of apparent violations of manner/result complementarity reveals that when a result verb has a conventionally associated activity, the associated activity may get lexicalized in some uses of the verb, but only if the result drops out (as with *cut* and *slice*). Likewise, when a manner has a conventionally associated result, the result may be lexicalized in some uses of the verb, but only if the manner component drops out (as with *climb*, *plunge*, and *soar*). Given our definition of lexicalization, which requires lexicalized meaning to be constant across all uses of a verb, such verbs, then, must be polysemous, having both manner and result senses. However, these limited instances of polysemy are motivated, arising from conventional associations in the real world between certain manners and results. Perhaps equally important is recognizing that this deeper understanding of the behavior of these verbs is made possible by carefully distinguishing facets of meaning which are directly attributable to the verb from facets of meaning which are derived from context.

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[12]Despite the many behavioral similarities, *slice* does differ from *cut* in one respect: it seems very difficult to get an anticausative use of this verb. We suspect that the anticausative use is precluded because of properties of the action of slicing itself, but this will need to be verified through additional investigation of this verb.

References

Arsenijević, Boban (2010) "On the syntactic nature of manner-incorporation", unpublished ms., Universitat Pompeu Fabra, Barcelona.

Beavers, John (2008) "Scalar Complexity and the Structure of Events", in Johannes Dölling and Tatjana Heyde-Zybatow, eds., *Event Structures in Linguistic Form and Interpretation*, Mouton de Gruyter. Berlin, 245-265.

Bohnemeyer, Jürgen (2007) "Morpholexical Transparency and the Argument Structure of Verbs of Cutting and Breaking", *Cognitive Linguistics* 18, 153-177.

Borer, Hagit (2005) *Structuring Sense II: The Normal Course of Events*, Oxford University Press, Oxford, UK.

Cifuentes Férez, Paula (2007) "Human Locomotion Verbs in English and Spanish", *International Journal of English Studies* 7, 117-136.

Fillmore, Charles J. (1982) "Toward a Descriptive Framework of Spatial Deixis", in Robert J. Jarvella and Wolfgang Klein, eds., *Speech, Place and Action*, John Wiley, London.

Geuder, Wilhelm (2009) "Descendre en grimpant: Une étude contrastive de l'interaction entre déplacement et manière de mouvement", *Langages* 175, 123-139.

Geuder, Wilhelm and Matthias Weisgerber (2008) "Manner of Movement and the Conceptualization of Force", slides, Journée d'étude "Il'y a manière et manière", Université d'artois, Arras, France.

Goldberg, Adele E. (1995) *Constructions: A Construction Grammar Approach to Argument Structure*, University of Chicago Press, Chicago, IL.

Goldberg, Adele E. (2010) "Verbs, Constructions and Semantic Frames", in E. Doron, M. Rappaport Hovav, and I. Sichel, eds., *Syntax, Lexical Semantics, and Event Structure*, Oxford University Press, Oxford, UK, 21-38.

Guerssel, Mohamed, Kenneth Hale, Mary Laughren, Beth Levin, and Josie. White Eagle (1985) "A Cross-Linguistic Study of Transitivity Alternations", *Papers from the Parasession on Causatives and Agentivity*, Chicago Linguistic Society, 48-63.

Haspelmath, Martin (1993) "More on the Typology of Inchoative/Causative Verb Alternations", in Bernard Comrie and Maria Polinsky, eds., *Causatives and Transitivity*, John Benjamins, Amsterdam, 87-120.

Hay, Jennifer, Christopher Kennedy and Beth Levin (1999) "Scalar Structure Underlies Telicity in 'Degree Achievements'", *SALT 9*, 127-144.

Jackendoff, Ray S. (1985) "Multiple Subcategorization and the Theta-Criterion: The Case of *Climb*", *Natural Language and Linguistic Theory* 3, 271-295.

Kennedy, Christopher (2001) "Polar Opposition and the Ontology of 'Degrees'", *Linguistics and Philosophy* 24, 33-70.

Kennedy, Christopher and Beth Levin (2008) "Measure of Change: The Adjectival Core of

Verbs of Variable Telicity", in Louise McNally and Christopher Kennedy, eds., *Adjectives and Adverbs in Semantics and Discourse*, Oxford University Press, Oxford, 156-182.

Kennedy, Christopher and Louise McNally (2005) "Scale Structure, Degree Modification, and the Semantic Typology of Gradable Predicates", *Language* 81, 345-381.

Kiparsky, Paul (1997) "Remarks on Denominal Verbs", in Alex Alsina, Joan Bresnan, and Peter Sells, eds., *Complex Predicates*, CSLI Publications, Stanford University, Stanford, CA, 473-499.

Koontz-Garboden, Andrew and John Beavers (2010) "Manner and Result in Roots of Verbal Meaning", unpublished ms., University of Manchester and University of Texas at Austin.

Krifka, Manfred (1998) "The Origins of Telicity", in Susan Rothstein, ed., *Events and Grammar*, Kluwer, Dordrecht, 197-235.

Levin, Beth (1993) *English Verb Classes and Alternations: A Preliminary Investigation*, University of Chicago Press, Chicago, IL.

Levin, Beth and Malka Rappaport Hovav (1991) "Wiping the Slate Clean: A Lexical Semantic Exploration", *Cognition* 41, 123-151.

Levin, Beth and Malka Rappaport Hovav (1995) *Unaccusativity: At the Syntax-Lexical Semantics Interface*, MIT Press, Cambridge, MA.

Levin, Beth and Malka Rappaport Hovav (1999) "Two Structures for Compositionally Derived Events", *SALT* 9, 199-223.

Levin, Beth and Malka Rappaport Hovav (2006) "Constraints on the Complexity of Verb Meaning and VP Structure", in Hans-Martin Gärtner, Regine Eckardt, Renate Musan, and Barbara Stiebels, eds., *Between 40 and 60 Puzzles for Krifka.* (http://www.zas.gwz-berlin.de/40-60-puzzles-for-krifka/).

Levison, Libby (1993) "The Topic is *Open*", *The Penn Review of Linguistics* 17, 125-135.

Mateu, Jaume and Víctor Acedo-Matellán (2011) "The Manner/Result Complementarity Revisited: A Syntactic Approach", Research Report GGT-11-02, Grup de Gramática Teórica, Department de Filologia Catalana, Universitat Autónoma de Barcelona, Barcelona. (Online at http://webs2002.uab.es/clt/publicacions/reports/pdf/GGT-11-02.pdf)

McBride, Christopher J. and Raymond P. Henry (1989) "Effects of Temperature on Climbing Behavior of Littorina irrorata: On Avoiding a Hot Foot", *Marine and Freshwater Behaviour and Physiology* 14, 93-100.

McClure, William (1990) "A Lexical Semantic Explanation for Unaccusative Mismatches", in Katarzyna Dziwirek, Patrick Farrell and Errapel Mejías-Bikandi, eds., *Grammatical Relations: A Cross-Theoretical Perspective*, CSLI Publications, Stanford, CA, 305-318.

Ramchand, Gillian C. (1997) *Aspect and Predication*, Clarendon Press, Oxford.

Rappaport Hovav, Malka and Beth Levin (1998) "Building Verb Meanings", in Miriam Butt and Wilhelm Geuder, eds., *The Projection of Arguments: Lexical and Compositional Factors*,: CSLI Publications, Stanford, CA, 97-134.

Rappaport Hovav, Malka (2008) "Lexicalized Meaning and the Internal Temporal Structure of Events", in Susan Rothstein, ed., *Crosslinguistic and Theoretical Approaches to the Semantics of Aspect*, John Benjamins, Amsterdam, 13-42.

Rappaport Hovav, Malka and Beth Levin (2010) "Reflections on Manner/Result Complementarity", in Edit Doron, Malka Rappaport Hovav, and Ivy Sichel, eds., *Syntax, Lexical Semantics, and Event Structure*, Oxford University Press, Oxford, UK, 21-38.

Rappaport Hovav, Malka and Beth Levin (in press) "Lexicon Uniformity and the Causative Alternation, to appear in Martin Everaert, Marijana Marelj, and Tal Siloni, eds., *The Theta System: Argument Structure at the Interface*, Oxford University Press, Oxford, UK.

Rosch, Eleanor (1978) "Principles of Categorization", in Eleanor Rosch and Barbara B. Lloyd, eds., *Cognition and Categorization*, Lawrence Erlbaum, Hillsdale, NJ, 27-48.

Tenny, Carol L. (1994) *Aspectual Roles and the Syntax-Semantics Interface*, Kluwer, Dordrecht.

van der Leek, Frederike (1996) "The English Conative Construction: A Compositional Account", *CLS* 32, 363-378.

Zlatev, Jordan and Peerapat Yangklang (2004) "A Third Way to Travel: The Place of Thai in Motion-Event Typology", in Sven Strömqvist and Ludo Verhoeven, eds., *Relating Events in Narrative 2: Typological and Contextual Perspectives*, Lawrence Erlbaum, Mahwah, NJ, 159-190.