

Lexical Semantics of Verbs V: Scales, Scalar Change, and Manner/Result Complementarity

Reading: RH&L 2002, in press; also suggested Rappaport Hovav 2008.

1 Beyond incremental theme: Scales and scalar change

Dowty's (1991) notion of "incremental theme" instantiates the insight that certain verbs show a homomorphism from a participant in the event they denote to the telicity of the event itself.

Subsequent researchers show the more general role of what Tenny calls "measuring out".

As Hay, Kennedy & Levin (1999) point out, with traditional incremental theme verbs the measure of the event is ACTUALLY the spatial extent of one of its arguments and not the argument itself.

By taking this perspective, Hay, Kennedy & Levin are able to propose a unified approach to the determination of telicity for three previously recognized types of verbs with variable telicity.

- (1) Incremental theme verbs:
 - a. Sam ate ice cream. (atelic)
 - b. Sam ate an ice cream cone. (telic)
- (2) Change of state verbs:
 - a. The icicle lengthened (over the course of a week). (atelic)
 - b. The icicle lengthened two inches. (telic)
- (3) Directed motion verbs:
 - a. The plane ascended (for 20 minutes). (atelic)
 - b. The plane ascended to cruising altitude. (telic)

They suggest that for each verb type, the measure of the event involves a property of an argument of the verb, though the particular property depends on the verb type.

- (4) The measure or SCALE across verb types:
 - a. Incremental theme verbs: the spatial extent (i.e. volume, area) of the argument
 - b. Change of state verbs: the values of a gradable property of the argument
 - c. Directed motion verbs: the path of motion of the argument

1.1 The notion of scalar change

The notion “measuring out” is now formalized using the notions “scale” and “scalar change”.
(McClure 1994; Rappaport Hovav 2008, 2009; RH&L in press).

- A SCALE is constituted by a set of degrees—points or intervals indicating measurement values—on a particular dimension (e.g., cost, length, temperature) with an ordering relation. The dimension represents an attribute of an argument of the verb, with the degrees indicating the possible values of this attribute (Kennedy 2001; Kennedy & McNally 2005).
- A SCALAR CHANGE in an entity involves a change in the value of one of its attributes in a particular direction on the scale and presupposes that these values form a scale.
- Studies of telicity recognize three types of scales, corresponding to the three types of verbs that figure in discussions of telicity (e.g., Beavers 2008; Borer 2005; Hay, Kennedy & Levin 1999; Krifka 1998; Ramchand 1997; Rappaport Hovav 2008; Tenny 1994).

- (5)
- a. PROPERTY SCALES: often found with change of state verbs
 - b. PATH SCALES: most often found with directed motion verbs
 - c. EXTENT SCALES: most often found with incremental theme verbs

- EXAMPLES:

— The change of state event *warm the soup* involves a scale of increasing values on a dimension of temperature; a warming event must have an entity showing an increase in value on this dimension.

— The directed motion event *ascend the stairs* involves a scale in the vertical dimension with the points ordered against the pull of gravity (i.e. a path); an event of ascending must have an entity showing an increase in value on this dimension.

— The incremental theme event *build a stadium* involves a scale of physical extent in 3-dimensions with the points ordered with respect to increasing volume; an event of building must have an entity showing an increase in value on this dimension.

CALCULATING TELICITY: A predication containing a scale with a specified bound will be telic, while a predication containing a scale with no specified bound will be atelic.

1.2 The lexicalization of a scale

- LEXICALIZED MEANING: Those components of a verb’s meaning that are specified and entailed in all uses of the verb, regardless of context.
- A verb’s lexicalized meaning is distinct from what is inferrable from a use of that verb in context.
— *break* lexicalizes a particular kind of change of state in an entity; it is silent about how this change comes about.
- Change of state verbs lexicalize a change in particular direction in the value of a scalar attribute, frequently from the domain of property concepts (Dixon 1982)—the types of attributes named by gradable adjectives, such as *cool, deep, dim, ripe, short, wide* (Hay, Kennedy & Levin 1999; Kearns 2006; Kennedy & Levin 2008; Winter & Rotstein 2004). The direction of the change is established

by a lexicalized relation to a “standard”, an element that is key to establishing whether a gradable adjective can apply to an entity: e.g., *a long table* has a length that is greater than a typical table.

NOTE: There are various subtypes of change of state verbs, reflecting the various property scale types (Cruse 1976, 1986; Kearns 2007; Kennedy & McNally 2005; Kennedy & Levin 2008; Winter & Rotstein 2004).

- Directed motion verbs lexically entail a scale constituted by the path of motion, itself composed of a set of contiguous locational points, with the ordering relation on them defined by the direction of motion with respect to a “reference object” (ground; Jackendoff 1983; Talmy 1975, 1985).

NOTE: There are striking similarities in the types of scales encoded in change of state verbs and in directed motion verbs, which justifies considering them both to be instantiations of scalar change (Rappaport Hovav 2009).

- Incremental theme verbs, in contrast, do not lexicalize a scale (Rappaport Hovav 2008, 2009); the extent scale is introduced by an argument of such verbs.

EVIDENCE (drawn from a larger discussion in Rappaport Hovav 2009):

— Such verbs do not lexically require an incremental relation; the existence of a strict incremental relation between the theme and the event depends on the subject, the object, and real world knowledge of how actions are carried out (cf. Jackendoff 1996; Verkuyl 1993).

- (6) a. The scanner read the barcode.
- b. Eye doctor to patient: Read this letter on the bottom of the chart.
- c. The politician read the newspaper from beginning to end.

— Although change of state verbs and directed motion verbs cannot appear with an explicitly expressed scale of another kind, they can appear with incremental themes.

- (7) a. *Casey arrived breathless. (on the result interpretation)
 (lexicalized path scale; property predicated of theme)
- b. *The heat ripened the nectarine into the trashcan.
 (lexicalized property scale; path predicated of theme)
- c. The crowd slowly left the building.
 (lexicalized path scale; theme serves as an incremental theme)
- d. The iceberg started melting from its north end, taking 6 months to melt completely.
 (lexicalized property scale; theme serves as an incremental theme)

This pattern suggests incremental themes are qualitatively different from property and path scales.

Rather, incremental theme verbs allow property/path scales predicated of their incremental theme.

- (8) a. The goats ate the lawn bare.
 (theme serves as incremental theme; property scale predicated of it)
- b. I wiped the entire table clean in three minutes.
 (theme serves as incremental theme; property scale predicated of it)

- As these examples show, not all instances of property and path scales are lexicalized in verbs; thus, there are nonlexicalized expressions of all three types of scale.

1.3 Nonscalar changes

Simplicity is a hallmark of a scalar change: it is a directed change in the value of a single attribute.

A NONSCALAR CHANGE in an entity is any change which isn't characterizable in terms of an ordered set of degrees—i.e. values of a single attribute—along a dimension representing this attribute.

Two properties contribute to making a change nonscalar:

- lack of an ordering relation
- complexity

The vast majority of verbs of nonscalar change involve a complex combination of many changes at once, and this complexity means that there is no single privileged scale of change:

bounce, exercise, flap, flutter, grimace, jog, knead, scribble, shudder, waltz, wave, ...

EXAMPLE: The verbs *jog* and *waltz* both involve a specific pattern of movement of the arms and legs that is repeated an indefinite number of times (Dowty 1979); collectively, these changes do not represent a change in the values of one attribute, nor is any one element in the sequence of changes the necessary starting point of motion.

Not all verbs of nonscalar change are so specific about the precise changes:

exercise requires an unspecified and unordered set of movements.

1.4 Scalar change and the manner/result verb distinction

The semantic criterion determining whether a root is manner or result must be lexically encoded.

PROPOSAL: The relevant criterion is “scalar change”: result roots specify scalar change and manner roots specify nonscalar change.

Result verbs, including directed motion verbs, denote events of scalar change and lexically entail an associated scale (e.g., Beavers 2008, Borer 2005, Hay, Kennedy & Levin 1999, Krifka 1998, Ramchand 1997, Rappaport Hovav 2008, Tenny 1994).

Manner verbs, including manner of motion verbs, lexicalize nonscalar changes—a complex combination of changes that lacks any privileged scale of change.

2 Manner/result complementarity: A reflection of a constraint on verb meanings?

- The proposal that both change of state and directed motion verbs lexicalize a scalar root receives further support from the observation that in both domains scalar verbs do not lexicalize a manner.

- Change of state verbs specify a change in their theme argument, but do not specify anything about how this change comes about.

- (9)
- a. I cleaned the tub by wiping it with a sponge/by scrubbing it with steel wool/by pouring bleach on it/by saying a magic chant.
 - b. The chef melted the chocolate by putting it out in the sun/by heating it in the microwave/by stirring it over a low flame.

— Directed motion verbs specify a direction of motion, but not how the motion is effected.

(10) I went to the theatre running/walking/by bus/by car/on a horse.

• This observation suggests the following lexicalization constraint:

(11) MANNER/RESULT COMPLEMENTARITY: Manner and result meaning components are in complementary distribution: a verb lexicalizes only one (L&RH 1991; RH&L in press).

• In fact, even when a result verb specifies a result brought about using a conventionally associated manner or a manner verb describes an action performed to bring about a conventionally associated result, such result verbs don't entail the manners, nor do such manner verbs entail the results.

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

(13) I cleaned the silver by rubbing it with silver polish/soaking it in hot water/scrubbing it with steel wool/saying "abracadabra".

2.1 The origins of manner/result complementarity: A constraint on lexicalization

• The root–event schema associations in (14) suggest the constraint (15):

(14) a. manner → [x ACT_{<MANNER>}]
b. result → [[x ACT] CAUSE [y BECOME _{<RES-STATE>}]]

(15) THE LEXICALIZATION CONSTRAINT: A root can only be associated with one position in an event schema, as either an argument or a modifier.

• A CONSEQUENCE: (15) constrains the meanings a verb can lexicalize; in particular, it rules out verbs flouting manner/result complementarity:

(16) Since manner roots modify ACT and result roots are arguments of BECOME, a root with both manner and result components would have to modify ACT **and** be an argument of BECOME in a single event schema, thus violating the lexicalization constraint.

• An interpretation of manner/result complementarity:

It arises from a real constraint on how much meaning can be “packaged” into a verb since manner and result components contribute to the complexity of a verb's meaning.

2.2 The domain of manner/result complementarity

The lexicalization constraint is precisely that: a constraint on what is lexicalized.

Thus, depending on the language, it may hold of a word, stem, or affix (RH&L to appear).

— In English complementarity is manifested in words, as most words are morphologically simple.

— In so-called “bipartite” verb languages like Lakhota manner/result complementarity holds of the pieces of words, rather than the words themselves.

(17) LAKHOTA (Foley & Van Valin 1984: 39-47, based on Boas & Deloria 1939):

- a. verb stems describe states which are permanent results of actions:
–*blečha* ‘be shattered (said of brittle material)’
–*blaza* ‘be ripped open’
- b. prefixes describe manner:
ya- ‘with the mouth’
na- ‘with the foot or leg’
yu- ‘by pulling, with the hands’
wa- ‘by a sawing motion, with a knife’
ka- ‘by a sudden impact’
- c. prefixes and verb stems combine to form verbs:
ya-blečha ‘break or cut with the teeth’
na-blečha ‘break by kicking or stepping on’

— Manner/result complementarity is not a constraint on what can be expressed in a VP; in English when a verb lexicalizes one of manner or result, the other can be expressed outside the verb.

- (18) a. A manner verb can combine with a result XP:
Pat wiped the table clean.
- b. A result verb can be accompanied by an adverbial XP expressing manner:
Pat cleaned the table by wiping it.

3 Putative counterexamples to manner/result complementarity

Despite the pervasiveness of manner/result complementarity, some potential counterexamples to manner/result complementarity are raised in the literature;

this calls into question whether it is indeed the consequence of a lexicalization constraint rather than just a preference regarding verb meanings.

ARGUE: The putative counterexamples actually do conform to manner/result complementarity:

- the relevant verbs are manner verbs in some uses and result verbs in others,
- they lack uses that are simultaneously manner and result, despite claims to the contrary.

This approach is built on the assumption that in the unmarked case what is lexicalized in a verb remains constant across all its uses, except in special circumstances, such as those now examined, where what is lexicalized remains constant across a verb sense.

3.1 A potential counterexample from the change of state domain

Guerssel et al. (1985) and Levin (1993:8) suggest *cut* has manner and result meaning components. If this is correct, this verb—and perhaps others like it—violates the proposed constraint.

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

3.1.1 Reasons why *cut* is apparently problematic

- EVIDENCE FOR *cut* AS A RESULT VERB:

- Its zero-related nominal *a cut_N* refers only to a result, a property it shares with other result verbs;
- In contrast, nominals zero-related to clear manner verbs lack a result interpretation; they necessarily refer to the action and not the physical result of the action, which can be perceived only after the action is over.

- (20) a. break_V/a break_N, crack_V/a crack_N, split_V/a split_N
b. (give it) a wipe, (give it) a kick, (go for) a walk/run

- EVIDENCE FOR *cut* AS A MANNER VERB:

- It is found in the conative construction, a property shared with manner but not result verbs:

- (21) 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)

- (22) Distribution of the conative construction:

- a. Ok with manner verbs: *claw, hit, kick, pull, splash, ...*
b. Out with result verbs: *break, crack, split, ...*

- *cut* has been said to lack anticausative uses, which are found with a majority of result verbs, but never with verbs with explicit manner components.

- (23) a. *The cake cut. (cf. The waiter cut the cake.)
b. *The table wiped. (cf. The waiter wiped the table.)
c. The window broke. (cf. The boy broke the window.)

3.1.2 Resolving the potential problem

THE PROPOSAL: *cut* lexicalizes result in most uses, but manner in some uses; however it lacks uses which lexicalizes both manner and result at once. Thus, any single use of *cut* meets the lexicalization constraint. Below, we speculate about when this circumstance—in which a verb has uses lexicalizing different meaning components—arises.

- THE RESULT USE: In its basic use, *cut* lexicalizes only a result: a clean separation.

- Yet a cutting event is usually understood as brought about by use of a sharp-edged instrument.
WHY? This is a perception due to the nature of the lexicalized result state.

- An examination of cutting events shows that *cut* does not specify the instrument or the action that the instrument is involved in; specifically, an agent need not wield the instrument.

- (24) “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).” (Bohnmeyer 2007:159)

— *cut* does have anticausative uses, despite received wisdom, supporting a purely result meaning.

- (25) 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)

Most likely, anticausative uses of *cut* were overlooked as most instances of cutting such as those involving food—the patient of most linguistic examples—violate a constraint on anticausatives: The event must happen without the agent’s continued intervention (Haspelmath 1993, L&RH 1995).

- (26) I cut the bread/*The bread cut.

The conditions allowing an anticausative are not purely lexical, but relate to properties of the event described in the sentence with the verb.

- THE MANNER USE: In some uses, including its conative uses, *cut* crucially does not entail a result, but simply the handling of a sharp-bladed instrument as is necessary for its intended use.

- (27) *cut* Conative LCS: x causes sharp edge to move along path toward y, in order to produce CUT on y, by sharp edge coming into contact with y. (Guerssel et al. 1985:59, (34))

— The conative is said to be licensed by motion and contact meaning components—i.e. some type of manner—and, indeed, in the conative, *cut* entails handling a sharp instrument in a particular way.

Although Bohnmeyer 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 the orange*, even if the orange were repeatedly dropped.

— Manner verbs (but not result verbs) allow unspecified and non-subcategorized objects (RH&L 1998); *cut* occasionally shows nonsubcategorized object uses.

- (28) Phillips, 44, has been on the run since April, when he **cut** his way out of an Erie County jail with a can opener. (www.msnbc.msn.com/id/14614953/)

— Presumably, the manner use of *cut* arises because the result associated with result *cut* is often brought about through the use of a particular type of instrument.

- THE CONCLUSION: *cut* has a manner use and a result use; no meaning component is constant across both uses.

3.1.3 How special is *cut*?

- *cut* belongs to a set of verbs whose members differ from one another in terms of result:

(29) cut, cube, dice, julienne, slice, sliver, ...

Each verb describes causing some matter to end up in very specific shapes; for this reason, the result characteristic of each verb is expected to be brought about by a specialized instrument, though neither the specific instrument, nor the action used in wielding it is lexicalized.

SUPPORT FOR A RESULT CLASSIFICATION: No conative; most have zero-related result nouns.

- (30) a. *cube/dice/julienne/sliver at
b. cube_V/a cube_N, dice_V/dice_N, slice_V/a slice_N, sliver_V/a sliver_N

- What makes *cut* special? It is so strongly associated with a particular way of handling the instrument that it is sometimes used to encode a manner; but, crucially, when encoding the manner, the result can no longer be entailed, as predicted by the lexicalization constraint.

SUMMARY: *cut*, *cube*, and *dice* are all result verbs.

— They specify a particular result and have related result nouns.

— Only *cut* seems to have an anticausative use, since only it specifies a result that can occur without the continued intervention of an agent.

— *cut* is associated with a conventional manner, which it can then lexicalize, with its result meaning component dropping out, as attested in its appearance in the conative.

3.2 A potential counterexample from the motion domain

A comparable potential counterexample exists in the motion domain: the English verb *climb*.

climb apparently expresses both manner ('clambering') and direction (upward) in some uses, contra manner/result complementarity (Fillmore 1982:32, Jackendoff 1985, Kiparsky 1997:490):

(31) Kelly climbed the tree.

climb has other uses that clearly meet the lexicalization constraint:

either they only entail upward motion or the apparently lexicalized direction is overridden:

- (32) a. *climb* expresses an upward direction only:
The plane/smoke climbed.
(NOTE: planes/smoke are inanimate and can't clamber, so manner isn't lexicalized)
- b. *climb* expresses a clambering manner of motion only:
Kelly climbed down from the roof.
Kelly climbed through the gap in the hedge.
(NOTE: direction is determined outside of verb, so is not lexicalized in verb)
- (33) Smoke climbed slowly and the falling sun was coloring it through ...
(books.google.com/books?isbn=0595002692)

There are no uses of *climb* that involve neither a clambering manner nor an upward direction:
The verb *climb* must have some meaning (besides just translational movement).

Jackendoff (1983) makes much of this pattern, and draws a general conclusion about the nature of concepts associated with words. However, he fails to notice that this pattern is necessarily found ONLY with verbs which apparently lexicalize two meaning components.

PROPOSAL: The uses of the verb *climb* can be explained in the same way as those of *cut*:

- A basic meaning:
 - *cut* encodes a result and has a conventionally determined manner;
 - *climb* encodes a manner and has a default or contextually determined direction (the problematic uses instantiate this option).
 - A second meaning:
 - With *cut*, the manner can get lexicalized, but only if the result drops out;
 - With *climb*, the default direction can get lexicalized, but only if the manner drops out.
- Each meaning shows manner/result complementarity, conforming to the lexicalization constraint.

3.2.1 The manner use of *climb*

The existence of uses of *climb* which lexicalize manner of motion only is supported by uses with PPs explicitly expressing a direction of motion, including downward, as in (32b).

What is the manner of motion lexicalized by *climb*?

- ‘clambering’, i.e. using hands and feet (Fillmore, Jackendoff)
- movement involving “force exertion against gravity” (Geuder & Weisgerber 2008)

The second option better captures *climb*’s range of uses, including its applicability to certain types of downward motion, which like upward climbing require motion that resists the pull of gravity; i.e. climbing is what prevents falling.

3.2.2 The direction-only use of *climb*

- What sets *climb* apart from most manner of motion verbs (e.g., *jog*, *ride*, *run*, *swim*) is the availability of a direction-only use as in (34), in addition to the manner of motion use.

- (34) a. The plane/elevator climbed.
b. The smoke climbed in a thick black rope, its sundial shadow at the acute angle of late morning. (books.google.com/books?isbn=0060762225)

These must be direction-only uses: the examples lack an overt indication of direction, yet the motion still is understood as upward, suggesting the direction comes from the verb.

Even in the presence of the type of goal phrase in (35) the direction must come from the verb, as the goal could in principle be above or below the theme.

- (35) a. The plane climbed to 9000 feet.
b. The elevator climbed to the tenth floor.

In comparable examples with animate themes, only the manner—and not the upward direction—is strictly entailed, presumably because the associated manner is typical of animates.

- (36) a. The children climbed on the jungle gym all afternoon.
 b. The backpackers climbed all day.
 (motion needn't be upward, but simply over a terrain requiring the relevant manner)

- Why does *climb*, unlike most manner of motion verbs, have a direction-only use?
 A manner that allows motion while resisting the pull of gravity is typically necessary when an animate entity wants to move upward;
 thus, there is a default association of this manner and upward direction.

As a consequence, *climb* has acquired a use that indicates motion in an upward direction, but only with a concomitant loss of the manner component, consistent with the lexicalization constraint.

Most likely, the availability of the direction-only use has led *climb* to pattern like *rise*: it too may be used to describe a change in an increasing direction along a scale; such uses clearly lack manner.

- (37) The prices/temperature climbed/rose.

Only a handful of manner of motion verbs pattern like *climb* because few involve manners that by their very nature are associated with default directions; see section 3.3.

3.2.3 Transitive *climb* does not lexicalize direction

Even if *climb* has some manner uses and some direction uses, transitive uses as in (38), which appear to lexicalize both meaning components, remain a potential problem.

- (38) Kelly climbed the tree.

PROPOSAL: Despite appearances, the transitive uses of *climb* ONLY lexicalize manner.

Evidence that Only Manner Is Lexicalized

KEY INSIGHT: Uses as in (38) have a reference object—a Ground—as direct object.

THE GENERAL RULE: The direction of motion in transitive uses is determined contextually from the combination of the manner, the nature of the reference object, and the intention of the agent.

- EVIDENCE THAT DIRECTION IS NOT LEXICALIZED:
 The direction of motion is not always understood as upward, as expected if it were lexicalized.
- Typically, motion on the path involving the reference object is understood as upward, as in (38), where the reference object has a prominent vertical dimension.
- When the reference object is a barrier (e.g., wall, fence), the path is understood as over it.

- (39) So I thought that if I **climbed** the fence I'd be able to reach the entrance and the machine where I can buy some chocolate. (BNC; JY9 971)

- THE LESSON: The reference object plays a part in determining the direction of motion: it defines a salient path via its inherent nature and the way an agent typically interacts with it.

The transitive uses of *climb*, then, conform to the lexicalization constraint.

Transitive *climb* Patterns Like Other Manner of Motion Verbs

- When other manner of motion verbs take a reference object as direct object, the direction again depends on the nature of the reference object and how it is interacted with.
- 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.

- (40) a. hike/ride the Appalachian trail — ‘hike/ride along the trail’
b. swim the Channel — ‘swim across the Channel’
c. run the track — ‘run around the track’

- But other directions are possible with alternative choices of reference object:

Even though (41) and (42) involve the same reference object, the larger context indicates that the direction is DOWN in (41) and UP in (42)—neither of which is the default ‘along’ of (40a).

- (41) 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>)
- (42) On light wind days you can fly your thermal plane from the lower North Bench. The launching/landing area is large, flat, and grassy . . . NO rocks. On breezy days you can enjoy classic “Slermal” conditions . . . **ride the slope**; catch a thermal; gain some big altitude; and then make a heart thumping dive to super-sonic speeds!
(http://www.flagstaffflyers.com/flyingsites/flyingsites_merriam.html)

Why Can’t *climb the tree* Mean ‘climb down the tree’?

The major factor involved in the absence of a downward interpretation for *climb the tree*: the nature of the reference object.

EXAMPLES:

Trees, like walls, are perceived as projecting upward from the ground, so both are typically encountered as something to ascend.

In contrast, cliffs may be encountered either projecting upward or downward from ground-level.

EVIDENCE FOR THESE DIFFERENT PERCEPTIONS FROM INTERNET SEARCHES:

- With *the/a tree*, there are over 12 times more *climb(ed) up* than *climb(ed) down*.
- With *the/a wall*, there are about 5 times more *climb(ed) up* than *climb(ed) down*.
- With *the/a cliff*, there are considerably less total examples, with slightly more *climb(ed) up*.

This suggests that if circumstances conspire, downward transitive uses of *climb* might be attested. And an internet search found dozens of them:

- (43) ‘Bring the Governor’s reply straight back,’ shouted Master Mace as Mungo **climbed** the rope ladder into the ship’s rowing boat. (James Riordan and Beaula Kay McCalla, *Rebel Cargo*, Frances Lincoln, 2007, p. 149; books.google.com/books?isbn=1845077741)

into does not contribute information about direction in (43), just as *to* does not in (35):
into is found with both downward motion as in (43) and upward motion as in (44).

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

Interestingly, such examples 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.

- (45) 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.

- (46) 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)

FURTHER SUPPORT: *scale*, which Goldberg (in press) suggests lexicalizes both manner and upward direction, shows a downward transitive use with *cliff*.

- (47) 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 vertical surfaces, (47) shows that the motion need not be upward, so that direction is not lexicalized.

CONCLUSION: The verb *climb* is an exception that prove the rule.

3.3 Potential counterexamples are systematic, even if sporadic

There is no reason that *cut* and *climb* should be unique, though such verbs would be expected to be only sporadically attested: precisely when there are results that are brought about in a specific way or manners that are associated with a specific result (direction).

- The verb *slice* is like *cut*: It too is a result verb, but since an event of slicing is prototypically associated with a particular manner, it too can appear in the conative and *way* constructions.

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

- (49) She pounded and **sliced** her way into the can, winding up with only half the tuna left inside a wickedly sharp six-pointed metal star. (books.google.com/books?isbn=087351324X)

The conative example must be understood as involving an agent using a knife-like instrument in the same way as when slices are cut; it would not be used, say, with a bread-slicing machine.

- The verb *clean* is another result verb which also has a manner meaning.

— AS A RESULT VERB: As a deadjectival verb, *clean* takes its name from the associated result state and entails the bringing about of this state.

— AS A MANNER VERB: *clean* shows such uses primarily in the context of housecleaning, which involves a conventional set of actions.

- A few other manner of motion verbs which by their very nature have default associations with specific directions of motion show a form of polysemy comparable to *climb*: e.g., *dive*, *scale*, *soar*.

3.4 The generalization for problematic verbs

An examination of apparent violations of manner/result complementarity reveals:

- When a manner has a conventionally associated result, the result may get lexicalized in some uses of the verb, but only if the manner component drops out (as with *climb* and *scale*).
- 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*, *slice*, and *clean*).

A CONSEQUENCE OF THE ANALYSIS: There are certain instances of polysemy.

4 Conclusions

- The notion of scalar change is the meaning component that figures in the determination of telicity; it also can be used to give content to the ontological root types, “manner” and “result”.
- Manner/result complementarity as a generalization about possible verb meanings follows from a lexicalization constraint, which can be understood as limiting the complexity of verb meanings.
- Purported exceptions to manner/result complementarity, including *climb* and *cut*, do not provide grounds for rejecting it. Rather, they involve forms of polysemy that are natural consequences of such complementarity and are insightfully understood in the context of such complementarity. (See Koontz-Garboden & Beavers 2009 for further potential counterexamples.)

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