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A Constraint on Verb Meanings: Manner/Result Complementarity

Beth Levin
Stanford University

(This research was carried out with Malka Rappaport Hovav, The Hebrew University of Jerusalem.)

1 The complementarity of manner and result

Verbs drawn from various lexical fields are commonly classified as either manner or result verbs:

(1) a. MANNER VERBS: specify a manner of carrying out an action.
cry, hit, pound, run, shout, shovel, smear, sweep, ...

b. RESULT VERBS: specify the result of an event.
arrive, clean, come, cover, die, empty, fill, put, remove, ...

As the examples illustrate, this distinction crosscuts the transitive/intransitive verb distinction.

The manner/result verb dichotomy is grammatically relevant (Fillmore 1970, RH&L 1998):

• Each type of verb shows distinct patterns of argument realization:

(2) a. UNSPECIFIED OBJECTS: Kim swept/*broke.

b. NON-SUBCATEGORIZED OBJECTS: Kim scrubbed/*broke her fingers raw.

c. CAUSATIVE ALTERNATION: Kim broke/wiped the window; The window broke/*wiped.

• Manner and result meaning components are in complementary distribution (L&RH 1991, 1995): a verb typically lexicalizes only one.

LEXICALIZATION: what a verb lexically specifies as part of its meaning. Lexicalized meaning involves those meaning components entailed in all uses of (a single sense of) a verb, regardless of context; thus, it is distinct from what can be inferred from a particular use of that verb in context.

— many result verbs lexicalize results that are prototypically associated with particular manners.
e.g., *clean* and *clear* lexicalize a state that may result from removing stuff from a surface.

— many manner verbs lexicalize manners that are prototypically associated with particular results.
e.g., *wipe* and *scrub* lexicalize a manner and describe actions involving surface contact and motion; these actions are often used to remove stuff from a surface.

HOWEVER, such result verbs don't entail the manners, nor do such manner verbs entail the results.

(3) I just wiped the table, but it's still dirty/sticky/wet.

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

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

(5) 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.

QUESTION: What is the significance of the observed manner/result complementarity?
— Does it simply reflect a preference for what type of meaning a verb can lexicalize?
— Or does it reflects a constraint on verb meaning? If so, what is the nature of the constraint?

PROPOSAL: Manner/result complementarity arises from a real constraint on the complexity of verb meaning, reflecting how much meaning can be "packaged" into a verb.

2 The representation of verb meaning: Roots and event schemas

• A verb meaning may be represented as a predicate decomposition consisting of two components (e.g., Borer 2005, Goldberg 1995, Grimshaw 2005, Hale & Keyser 2002, Jackendoff 1990, Marantz 1997, Pesetsky 1995, Pinker 1989, RH&L 1998)?

— *Event schema:* structural component of meaning representing an event type; drawn from a limited inventory consisting of the event types encodable in language.

— *Root:* idiosyncratic component of verb meaning, characterized by an ontological categorization, chosen from a fixed set of types: e.g., state, result state, thing, stuff, container, manner, instrument.

• *Canonical realization rules:* express how the ontological category of a root determines its integration into an event schema (RH&L 1998:109).

(6) a. manner → [x ACT$_{<MANNER>}$]
(e.g., *jog, run, creak, whistle, . . .*)

b. instrument → [x ACT$_{<INSTRUMENT>}$]
(e.g., *brush, hammer, saw, shovel, . . .*)

c. container → [x CAUSE [y BECOME AT <*CONTAINER*>]]
(e.g., *bag, box, cage, crate, garage, pocket, . . .*)

d. internally caused state → [x BECOME <*STATE*>]
(e.g., *bloom, blossom, decay, flower, rot, rust, sprout, . . .*)

e. externally caused, i.e. result, state →
[[x ACT] CAUSE [y BECOME <*RES-STATE*>]]
(e.g., *break, dry, harden, melt, open, . . .*)

Roots are integrated into schemas as ARGUMENTS (e.g., (6c)-(6e)) or MODIFIERS (e.g., (6a)-(6b)) of predicates; roots are italicized and in angle brackets; notated via subscripts when modifiers.

3 Constraints on possible verb meanings

Grimshaw (2005:85) asks: "How complicated can a verb meaning be?

(7) "On the one hand it seems that the answer is: as complicated as you want. For example, suppose there is a manufacturing process that involves pulverizing something then mixing it with molten plastic, allowing it to harden and then encasing it in steel. Of course we can label the entire process with one verb: to *smolt*, for example." (Grimshaw 2005:85)

3.1 The nature of previously proposed constraints

Nonetheless, she proposes that there are constraints on the complexity of verb meaning: she suggests that "unlimited complexity" in meaning is confined to the root, while the event schema is "rigidly constrained" (2005:85):

(8) "However, looked at from another point of view, such a verb [e.g., *smolt* in (7)] is semantically no more complex than any other: it is either a causative or an activity predicate." (2005:85)

As this quote suggests, most proposed constraints on verb meaning pertain to the event schema, but manner/result complementarity cannot follow from such constraints as it involves the root.

3.2 The lexicalization constraint

PROPOSAL: There is a constraint on how roots can be associated with event schemas; in turn, it constrains the meaning that a root can lexicalize.

Such a constraint is suggested by the nature of the canonical realization rules: in these rules, manner roots modify ACT and result roots are arguments of BECOME.

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

The constraint requires a root to be associated with only one position in an event schema.
As this association is determined by the meaning encoded in the root, it follows that a root cannot "package" a meaning which would cause it to be associated with more than one such position.

(10) A given root can't modify ACT **and** be an argument of BECOME in a single event schema.

A consequence: there are impossible roots—those which violate manner/result complementarity.

3.3 The scope of the lexicalization constraint

The lexicalization constraint is precisely that: a constraint on what is lexicalized, whether as a word, stem, or affix.

— As most English words are morphologically simple, manner/result complementarity is manifested in words.

— But there are some other so-called "bipartite" verb languages where manner/result complementarity holds of the pieces of words, rather than words themselves.

(11) LAKHOTA (Foley & Van Valin 1984, 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 means/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'

(12) WASHO: "... the stem expresses a change of state in an entity, while the prefix expresses a different entity or agency causing this effect. Most of the stems imply a deleterious change, such as the termination of life or of combustion, or the cutting or breaking up or distortion or harming of an object, or at least the exertion of force upon an object to move or otherwise change it." (Jacobsen 1980:91)

Lakhota and Washo verbs are formed by pairing a means/manner prefix with a verb stem naming a paired conventionally-expected result; each piece meets manner/result complementarity.

3.4 A motivation for the lexicalization constraint

An interpretation of the constraint: It arises because manner and result components contribute to the complexity of a verb's meaning and there is a constraint on its overall complexity.

Other possible measures of "complexity": number of lexical entailments or extent of real world knowledge (presuppositions) associated with a verb. However, the actual "complexity" of the individual meaning components does not seem to be the issue in delineating possible verb meanings.

• COMPLEXITY OF LEXICAL ENTAILMENTS: The verb *tango*, which refers to the performance of a specific dance, must be associated with more lexical entailments (i.e. detail) than the verb *dance*, and thus *tango* could be said to have a more complex meaning than *dance*, specifically a more complex manner.

But from the perspective of the lexicalization constraint, *tango* is no more complex than *dance*; there seems to be no constraint on how detailed the content of the manner component can be.

• COMPLEXITY OF "PRESUPPOSITIONS": Some verbs have extremely complex presuppositions or, perhaps more precisely, associated real world knowledge.

(13) The verb *appeal* "presupposes the existence of a previous complex event involving a trial which resulted in a guilty verdict, and asserts a subsequent act of filing legal papers for the purpose of a retrial." (Goldberg 1998:43)

The complexity of real world knowledge apparently does not contribute to complexity from the perspective of the lexicalization constraint; there seems to be no constraint on how complex such knowledge can be, as already noted by Grimshaw in her discussion of *smolt*.

4 Refining the notions of result and manner

THE NEXT STEP: If the lexicalization constraint is to have real empirical content, the criteria which determine whether a root's type is manner or result must be made explicit.
QUESTION: What semantic notions of manner and result matter to manner/result complementarity?

4.1 Telicity is not the answer

• Telicity is often said to involve a result state, and indeed some result verbs are necessarily telic.

(14) "One performance differs from another in accordance with the differences between states of affairs brought about: performances are specified by their ends." (Kenny 1963:178)

• THE PROBLEM: Telicity is lexically encoded only for a very small part of the English verb inventory (Filip 2005, Kratzer 2004, Rappaport Hovav in press).

e.g., some result verbs are not necessarily telic: Gradable change of state verbs—i.e. degree achievements (Dowty 1979)—may be telic or atelic.

(15) a. The chemist cooled the solution for three minutes.
b. The chemist cooled the solution to the desired temperature in three minutes.

• More often, telicity is compositionally determined (Filip & Rothstein 2006, Hay, Kennedy & Levin 1999, Krifka 1998).

• Result and manner must be characterized in terms of a lexically encoded notion; thus, the notion of result should not be equated with telicity.

THE NEXT STEP: Compare the change of state domain to another domain—motion—also showing manner/result complementarity.

4.2 Direction as a type of result

Classification of motion verbs in terms of "conflation" of meaning components (Talmy 1975, 1985):
— Motion and path: inherently directed motion verbs, e.g., English *arrive*, *ascend*, *descend*, *enter*
e.g., *ascend* specifies a direction of motion, but not the manner in which the motion is effected.
— Motion and manner: manner of motion verbs, e.g., English *amble*, *jog*, *run*, *swim*
e.g., *jog* specifies a manner of motion, but is neutral as to the specific direction of motion.

Classification reveals a manner/direction complementarity akin to manner/result complementarity.
In fact, L&RH (1992) take directed motion verbs to be a type of result verb;
L&RH (1995) subsumes both under the rubric "directed change" verbs.

What does direction of motion have in common with the more prototypical change of state results,
which justifies subsuming them under result and distinguishing both from manner?

4.3 Scalar and nonscalar changes

Manner and result verbs are dynamic, and all dynamic verbs involve change (Dowty 1979);
however, dynamic verbs do not all involve the same type of change.
Two types of change (e.g., McClure 1994, Rappaport Hovav in press, RH&L 2008) correlate with the manner/result verb distinction in a way that supports treating direction of motion as result:
— SCALAR CHANGE, as in the events denoted by *warm, ripen, cool, fall, ascend*, ...
— NONSCALAR CHANGE, as in the events denoted by
play (in the sand) scribble (on paper), flutter, exercise, tickle, writhe, scream, laugh, rain, ...

PROPOSAL: Result and manner roots specify distinct types of changes:

Root type	Type of change specified
Result root	scalar change, i.e. path traversal or change of state
Manner root	nonscalar change

These two types of change are the meaning components in complementary distribution in verb roots.

• SCALAR CHANGES

Verbs denoting events of scalar change in one argument lexically entail a scale (e.g., Beavers in press, Borer 2005, Hay, Kennedy & Levin 1999, Krifka 1998, Ramchand 1997, Tenny 1994).
A scale is a set of degrees—points or intervals indicating measurement values—ordered on a particular dimension (e.g., height, temperature, cost) (Kennedy 2001).
The dimension represents an attribute of an argument of the verb, with the degrees indicating the possible values of this attribute.
A scalar change in an entity involves a change in the value of this attribute in a particular direction along the associated scale.

Directed motion verbs as well as change of state verbs specify such changes,
as the direction of motion defines a scale with the ordering relation defined by the direction.
Thus, subsuming verbs of both types under a class of result verbs is justified.

EXAMPLES:
— The change of state verb *warm* 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 verb *descend* involves a scale composed of decreasing values on a dimension of height; a descending event must have an entity showing a decrease in value on this dimension.

A scalar change is SIMPLE in that it specifies a change involving one attribute of an entity.
The change may be characterized by a two-point or a multiple-point scale (Beavers in press):
— Changes with a multiple-point scale are related to gradable adjectives (degree achievements, e.g., *dry, cool*) and gradual traversals of path (certain directed motion verbs, e.g., *ascend*).
— Changes with a two-point scale are related to true achievements (e.g., *arrive, crack*).

Verbs associated with both types of scale show manner/result complementarity,
supporting the proposal that both involve scalar change.

Further support for taking directed motion and change of state to involve scalar change comes
from parallel generalizations governing telicity in the two domains (RH&L 2008).

• NONSCALAR CHANGES

A nonscalar change is any change that cannot be characterized in terms of an ordered set of degrees along a dimension representing a single attribute.

Two properties, then, contribute to making a change nonscalar:
— It lacks an ordering relation.
— It is typically complex, involving many changes at once.

Manner verbs, including manner of motion verbs, involve nonscalar changes:
exercise, flap, 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.
However, not all verbs of nonscalar change have roots that are so specific about the precise
changes, e.g., the verb *exercise*.

A nonscalar change may be along a single dimension, if it does not involve an ordering relation.
EXAMPLE: The verb *wander* defined as: "to go aimlessly, indirectly, or casually; meander: *The river wanders among the rocks*". (*American Heritage Dictionary*)

SUMMARY: Directed motion and change of state instantiate the same type of change; verbs that lexicalize one of them never also lexicalize a manner, conforming to manner/result complementarity.

5 Potential counterexamples to manner/result complementarity

5.1 From the change of state domain

Guerssel et al. (1985) and Levin (1993:8) suggest *cut* has manner and result meaning components.
Intuitively, this suggestion makes sense as the event described involves the production of an incision,
which requires the use of an instrument.

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

• EVIDENCE FOR *cut* AS A RESULT VERB:

The derived nominal *a cut*$_{\mathrm{N}}$ refers to a result, a property shared with result verbs:
break$_{\mathrm{V}}$*/a break*$_{\mathrm{N}}$, *crack*$_{\mathrm{V}}$*/a crack*$_{\mathrm{N}}$, *split*$_{\mathrm{V}}$*/a split*$_{\mathrm{N}}$

• EVIDENCE FOR *cut* AS A MANNER VERB:

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

(17) a. 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)

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

(18) Distribution of the conative construction:

a. Ok with manner verbs: *claw, hit, kick, pull, splash, ...*

b. Out with result verbs: *break, crack, split, ...*

THE POTENTIAL PROBLEM: If *cut*'s meaning involves both manner and result, it would counterexemplify the lexicalization constraint.

5.1.1 Resolving the potential problem

• PROPOSAL—PART I: In its basic use, *cut* only lexicalizes a result; it does not lexicalize a manner.

WHY THEN IS *cut* SAID TO INVOLVE MANNER AS WELL AS RESULT?
Due to the nature of the lexicalized result, a cutting event is generally understood to have been brought about through the use of a sharp-edged instrument.

SUPPORT: An examination of cutting events shows that *cut* does not specify the instrument or the action that the instrument is involved in.

(19) "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)

• PROPOSAL—PART II: Some uses of *cut*—e.g., the conative uses—lexicalize a manner, but only at the expense of the result: they entail wielding a sharp instrument in a particular way, but do not entail a result.

(20) *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))

SUPPORT: both examples in (17) explicitly mention such an instrument, reinforcing the manner component of meaning.

FURTHER SUPPORT: Nonsubcategorized object uses of *cut* have similar interpretive restrictions.

(21) 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/)

• NOTE: Each use of *cut* meets the lexicalization constraint.

5.1.2 Defusing another potential problem

There are claims that *cut* lacks anticausative uses—an observation used to support a joint manner/result analysis since verbs with explicit manner components lack anticausative uses.

In fact, *cut* does have apparently anticausative uses.

(22) 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. As I was leading across the traverse on the icefield I kept looking up to try to spot the overhang on which the rope **cut**. (http://www.americanalpineclub.org/pages/story/7/26)

Why doesn't *cut* usually alternate? It would violate a constraint on anticausatives:
The event must happen without the agent's continued intervention (Haspelmath 1993, L&RH 1995).
However, this constraint is not met when food—the patient of most linguistic examples—is cut.

(23) I cut the bread/*The bread cut.

That does not mean that the verbs in *I cut the bread* and *The rope cut* are different verbs.
Instead, we suggest that the conditions for the appearance of the anticausative are not purely lexical; rather, they relate to the properties of the event described by the sentence containing the verb.

5.1.3 How special is *cut*?

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

(24) 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: Most of these verbs lack a conative use.

(25) ∗ cube/dice/julienne/sliver at

• However, since *cut* is so strongly associated with a particular way of handling the instrument, it is sometimes used to encode a manner, but then it no longer lexicalizes a result.

A SIMILAR VERB: *slice* behaves 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.

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

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.

SUMMARY: *cut, dice, cube,* and *slice* 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.
— Both *cut* and *slice* are associated with conventional manners; they then can lexicalize the manner, with the result meaning component dropping out, and appear in the conative.

5.1.4 Such polysemy is systematic even if, a priori, not productive

The English verb *clean* is also basically a result verb with manner uses:

• 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.

(27) #I cleaned my glasses, but they're still as dirty as they were before.

Unlike many result verbs, *clean* does not easily show anticausative uses,
most likely for the same reason as *cut*.

• AS A MANNER VERB: *clean* shows such uses only in the context of housecleaning.

— In this context, it allows unspecified and nonsubcategorized objects:

(28) I cleaned before I left for work.

(29) Margaret Anderson, played by Jane Wyatt, vacuumed, dusted, cooked, and **cleaned** her way through episodes of Father Knows Best. (books.google.com/books?isbn=0226886719)

— It no longer entails a result of cleanness:

(30) You wouldn't know she cleaned today; there are still spots on the mirror and dust on the shelves.

— Conjunctions as in (29) suggest *clean* describes one of the activities involved in housekeeping. It is not very specific; in this respect it is similar to the verb *exercise*.

— Although many things can be cleaned, the understood object in the unspecified object use must be a room or something in a room.

(31) a. The soldier cleaned his gun. $\not\rightarrow$ The soldier cleaned.
b. The hygienist cleaned my teeth. $\not\rightarrow$ The hygienist cleaned.

This restriction is not unexpected if this use involves a manner, as the activity used to bring cleanness about depends on what is being cleaned: a counter, fabric, a gun, teeth, etc.

5.2 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 1982:32-33, Jackendoff 1985, Kiparsky 1997:490):

(32) Kelly climbed the tree.

climb has other uses that meet manner/result complementarity: either they only entail upward motion or the apparently lexicalized direction is overridden:

(33) a. *climb* expresses an upward direction only:
The plane climbed to a cruising altitude.
(NOTE: as plane is inanimate, it can't clamber, so manner isn't lexicalized in verb)

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)

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 problem 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.
This pattern of meanings conforms to manner/result complementarity.

5.2.1 The directed motion use of *climb*

What sets *climb* apart from most manner of motion verbs, such as *jog, ride, run,* and *swim*, is the availability of a direction-only use as in (33a) in addition to the manner of motion use.

WHAT MAKES *climb* SPECIAL? WHY DOES IT SHOW THESE TWO USES?
Its manner allows motion while resisting the pull of gravity, and motion in this manner is typically necessary when an animate entity wants to move upward;
thus, there is a default association of clambering manner and upward direction.

Perhaps as a consequence, *climb* has acquired a use that indicates motion in an upward direction, while losing the manner component.
In this way, its direction-only use is consistent with the lexicalization constraint.

Few manner of motion verbs pattern like *climb* because they do not involve a manner that by its very nature is associated with a specific default direction.

(NOTE: Even when an entity climbs downwards, this manner of motion is used to allow the climber to move while resisting the pull of gravity: climbing is what prevents falling.)

5.2.2 Resolving the potential problem

The problematic uses of *climb* have a reference object—critical to defining the direction of motion—as direct object, as in (32).

Such uses do NOT lexicalize an upward direction: they only lexicalize manner.

EVIDENCE THAT DIRECTION IS NOT LEXICALIZED: With transitive *climb*, the direction is not always understood as upward, as expected if direction were lexicalized.

Rather, direction of motion is apparently inferred given real world knowledge about how clambering is carried out with respect to particular reference objects in the context of intentions of agents.

• Typically, motion on the path involving the reference object is understood as upward, as in (32), due to the default association of clambering manner and upward direction.

• When the reference object is a barrier (e.g., wall, fence), the path is understood as over it.

(34) a. 'I couldn't see his face very well because the leaves and branches were in the way, but I saw him **climb** the fence and steal the bulbs.' (BNC; B0B 1418)

b. 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)

NOTE: It could be argued that *climb* specifies both clambering manner and upward movement in (34) with 'over' being inferred. It is more parsimonious, however, to say that transitive *climb*, which clearly lexicalizes manner, lexicalizes no more than that, since a manner-only meaning of *climb* is independently necessary. What makes transitive uses of *climb* different is that direction is inferred contextually rather than being specified in a PP.

CONCLUSION: the reference object plays a part in determining the direction of motion with *climb*: it defines a salient path via its inherent nature and the way it is interacted with.

A QUESTION: Why can't *climb the tree* mean 'climb down the tree'?
Presumably, because typical clambering is performed with the intention of going upward.

FURTHER SUPPORT: 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 default direction understood with each verb.

(35) 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:

— *hike*: while usually understood as specifying motion "along" the reference object, in the appropriate context, it can be understood as involving upward motion.

(36) So I decided to try to **hike** the slope behind the condo. This was not my best idea ever. The slope was very steep and covered in loose sharp rocks . . .
(http://www.pbase.com/jimgephart/image/47620997)

— *ride*: usually means 'ride along', as in (37)

(37) At appointed intervals the burgesses formally **rode** the boundaries to make sure that no encroachments or neglect had occurred. (BNC; EF2 1025)

Yet even though (38) and (39) involve the same reference object, the larger context indicates that the direction is down in (38) and up in (39).

(38) 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)

(39) 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)

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

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

5.2.3 Another verb that patterns like *climb*: The verb *dive*

The verb *dive* behaves very much like *climb*: some uses seem to involve both a manner (move through a medium headfirst) and a direction (downward); others seem to involve only manner or only direction.

— prototypical (?) *dive*: both manner and direction

(40) The contestant dove into the pool.

Despite the preposition *into*, the contestant is understood to move downward as s/he enters the water headfirst. The downward direction must be associated with the diving event since *into* cannot contribute this notion (cf. *step/run into a room*).

— *dive* may appear with prepositions indicating directions other than down, suggesting that motion is not lexicalized in these uses:

(41) Watch the dog **dive** across the goal and stop a shot ... (youtube.com/watch?v=0mDWNGbbAHs)

(42) You will have to jump over, slide under and **dive** across the animals that can hurt you.
(http://www.myfreegamespot.com/online-games/22700/Play-Nothing-can-Stop-Me!.html)

— *dive* shows uses with inanimate themes, where only direction is entailed, suggesting manner is not lexicalized in these uses:

(43) The greatest sales and price declines, however, were in the High Desert region further east of the scorched earth where sales crashed by 62.7 percent and prices **dove** by 17.4 percent. (http://realtytimes.com/rtpages/20071029_pricedecline.htm)

PROPOSAL: Like *climb*, *dive* lexicalizes only one meaning component in a given use in conformance with manner/result complementarity. Again like *climb*, *dive* involves a manner which is naturally associated with a particular direction of motion, giving rise to apparent counterexamples to manner/result complementarity.

HOW *dive* DIFFERS FROM *climb*: It can be difficult to think of transitive uses of *dive*.

• There are few attested uses that maintain the punctuality found with most intransitive uses of *dive*.

(44) "I was horror struck. Everything happened so fast. The car skidded off to the left and seemed to **dive** the fence only 10 yards from me." (www.motoresenv.com/notas_biografias.htm)

• Transitive uses tend to emphasize the 'move through a medium' (as in scuba diving) rather than the punctual 'plunge into (headfirst)' interpretation: this may be because reference objects usually have spatial extent, requiring the event to have duration, but the plunge sense of *dive* is punctual.

(45) a. **Dive** the depths of a secret reef where 10-foot sharks, fierce barracuda and graceful stingrays glide through amazing coral formations. (www.chattanoogasummer.com/Newsroom.htm)

b. **Dive** the waters surrounding this jewel-like island in the Sulu Sea, one hour by boat from Sandakan and a protected marine area. (www.caradonna.com/Product/WhatsNew/LankayanIslandDiveResort.aspx)

c. I had the opportunity to **dive** the rapids below the Hoover Dam on Saturday ... (www.scubaboard.com/forums/archive/index.php/index.php/t-200817.html)

CONCLUSION: The verbs *climb* and *dive* are the exceptions that prove the rule.

5.2.4 The generalization for motion and change of state verbs

• 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 *dive*).

• 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.

5.3 From the incremental theme domain

There is a class of activity verbs which specify the activity of the agent and in addition entail some kind of change in the entity denoted by the direct object.

(46) brush, comb, grind, mow, ...

NOTE: *mow* specifies the activity of an instrument and not the agent wielding that instrument; *brush* and *comb* may be similar.

QUESTION: Do these verbs constitute counterexamples to the proposed lexicalization constraint?

ANSWER Though they specify a change in both (the entities denoted by) the subject and object, these changes are nonscalar and, therefore, are not counterexamples to the constraint.

Verbs like *mow, grind, brush*, and *comb* specify changes which involve a complex interaction between the (entities denoted by the) subject argument and the object, and this renders the change nonscalar in nature.
The change in the object can be characterized only by concomitant reference to the subject's activity.
EXAMPLE: while grinding and chopping meat may lead to the same result, grinding and chopping are different activities.

EVIDENCE THAT LANGUAGE DOES NOT TREAT THESE CHANGES AS SCALAR:
It is not possible to isolate the change that the entity denoted by the direct object undergoes and to use a scalar modifier to describe this change.

(47) a. ∗ My lawn was more mowed than yours.
(cannot be used if my lawn is shorter than yours).
b. More of my lawn was mowed than yours.
c. My lawn is better-mowed than yours.

(48) a. ∗ The beef is more ground than the turkey.
(cannot be used if the beef is more finely ground than the turkey).
b. More of this meat is ground.
c. This meat is more finely ground.

The same applies to verbs describing different types of cooking/baking:
EXAMPLE: *sauté* means something like 'stir food with a bit of oil over heat', but cannot be used with a scalar modifier to describe the degree to which the food is heated.

(49) ∗ These vegetables are more sautéed than those.

These verbs show the properties of activity verbs and not change of state verbs: they allow unspecified objects and an array of non-subcataegorized objects.

(50) a. I mowed all day long.
b. . . . and as the AF **mowed** himself into a perspiring frenzy . . .
(http://www.ypsidixit.com/blog/archives/2006/08/)

6 Conclusion

• Manner/result complementarity as a constraint on possible verb meanings may follow from a lexicalization constraint which limits the complexity of verb meanings.

• The lexicalization constraint supports the use of a structured representation of verb meaning, such as a predicate decomposition, over purely entailment-based approaches (e.g., Dowty 1991), as the former allows for the relevant characterization of meaning complexity.

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