

# Questioning the manner/result complementarity<sup>1</sup>

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## 1 Introduction

- Rappaport Hovav and Levin (in press; RHL) have recently argued that verbs fall into (at least) two classes: those encoding manner (1a) and those encoding result (1b).

- (1) a. Verbs encoding a manner: *run, walk, swim, scrub, etc.*  
 b. Verbs encoding a result: *break, smash, crush, destroy, etc.*

- RHL (p. 8) claim that no verb encodes both — the manner in which something comes to be broken is unspecified for *break*-type verbs, while the result is unspecified for *run*-type verbs.
- This complementarity follows from how verb meanings are built up in the lexicon: a root can either modify an underlying ACT predicate (1a) or be an argument of a BECOME (1b).

- (2) a. [ x ACT<sub><ROOT></sub> ] b. [ [ x ACT ] CAUSE [ y BECOME < ROOT > ] ]

- This supposed distinction is an important one, and the proposed explanation has broad implications for work in verb classes and typology (e.g. see Talmy's 2000 typology).
- In this talk we examine the empirical and theoretical foundations for this proposal, and argue for various refinements that sharpens its predictions but narrows its scope significantly.
- Empirically, we begin by reviewing previously proposed diagnostics for identifying result and manner in a verb's meaning, and suggest that these diagnostics are interdependent in ways that make them inappropriate for verifying the complementarity claim.
- We thus propose instead a series of independent, positive criteria for identifying manner and result that can also apply across a range of verb classes.
- By these diagnostics, we argue that there are verbs — in particular manner of death verbs (Krohn 2008) — that have both roots, counterexamplifying the primary generalization.

- (3) DeFarge drowned/hanged/electrocuted/beheaded/guillotined Marie.

- Furthermore, theoretically, we argue that the property of (2) that explains the complementarity — single rootedness — may not follow from the theory as currently stated.
- Rather, conceived truth-conditionally, we predict that there *should* be verbs encoding both manner and result, and manner of death verbs fill in this gap, much like *your ass* fills a gap in Kiparsky's (2002) pronominal typology (Beavers and Koontz-Garboden 2003, 2006).
- However, we conclude that, under a more fine-grained conception of types of results and types of manner, some complementarity may be observed.

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## 2 Result meanings and manner of death verbs

- According to RHL, verbs lexicalizing a result are specifically those verbs that  
“[denote] events of scalar change . . . where a scale is a set of degrees—points or intervals indicating measurement values—on a particular dimension (e.g., height, temperature, cost), with an associated ordering relation” (RHL, 8)

- Scalar change necessarily involves change in degree along a scale:

(4) I warmed the soup  $\approx$  the degree of warmth of the soup increased.

- We consider several scalar change tests, and show that manner of death verbs encode it.

### Result diagnostic # 1: Contradiction

- We first establish whether there is a result at all. We believe it uncontroversial that a verb encodes a result if it cannot be denied that a result state obtains, though we must be careful to find a test of appropriate generality for a range of result verbs. *Something is different about x* captures at least property change verbs (Beavers 2008a) but excludes all manner verbs:

(5) a. Bob just yelled/ran quickly/blinked slowly, but nothing is different about him.  
b. #Shane just broke/smashed/destroyed the vase, but nothing is different about it.

- By this diagnostic, manner of death verbs pattern with result verbs:

(6) #Bill just drowned/hanged/crucified/beheaded Joe, but nothing is different about him.

### Result diagnostic # 2: Object deletion

- Second is whether the change is scalar. Rappaport Hovav (2008:24) suggests that scalar verbs disallow object deletion since “. . . scales require that the participant whose property is measured out by them is overtly realized”.

(7) a. All last night, Cinderella scrubbed.  
b. All last night, we dimmed \*(the lights in the house).

(8) a. Cinderella outscrubbed her stepsisters.  
b. \*Our stage-hand outdimmed your stage-hand.

- If manner of death verbs encode results, they are also predicted to disallow object deletion, as seems to be the case with at least some versions of this test.

(9) a. \* All last night, Mary drowned/hanged/crucified/electrocuted.  
b. ? My executioner can out-electrocute/hang/crucify/drown your executioner’s sorry ass any day.

### Result diagnostic # 3: Restricted resultatives

- Rappaport Hovav (2008:22) (see also Beavers 2008a) claims that “[a] verb with no lexically specified scale can appear with a variety of results. In contrast, verbs which have lexically specified scales . . . are very restricted in the kinds of resultatives they can appear with.”

- (10) a. We steamed the clothes dry/clean/stiff.  
 b. Cinderella scrubbed her knees sore/the dirt off the table/the table clean.
- (11) a. Then the biologists dimmed the room to the level of starlight ... ([www.findarticles.com/p/articles/mi\\_m1134/is\\_2\\_112/ai\\_98254950](http://www.findarticles.com/p/articles/mi_m1134/is_2_112/ai_98254950))  
 b. # We dimmed the room empty. (Rappaport Hovav 2008: 22-23)
- Manner of death verbs again pattern like scalar change verbs:
 

(12) a. # Shane drowned/hanged/electrocuted Sandy silly/happy/crazy.  
 b. Faulty ground wires in a building electrocuted him to death in 2004. ([buzz.yahoo.com/article/1:y\\_news:31f4c8213ef1e2e4e5ae60d75a00b97f](http://buzz.yahoo.com/article/1:y_news:31f4c8213ef1e2e4e5ae60d75a00b97f))  
 c. When he came, his semen short circuited (*sic*) the sander and electrocuted him dead. ([www.zcultfm.com/~comic/viewtopic.php?t=27769&f=2&view=previous](http://www.zcultfm.com/~comic/viewtopic.php?t=27769&f=2&view=previous))
  - **Summary:** We have reviewed several diagnostics for scalar change, and the diagnostics indicate that manner of death verbs encode a scalar change. There is the question of what sort. There are two types of scalar changes, distinguished by comparative morphology on the corresponding adjective (Kennedy and McNally 2005, Beavers 2008b):
 

(13) a. Gradable: *cool, dry, flatten* (cf. *cooler, drier, flatter*)  
 b. Non-gradable: *break, arrive, die* (cf. *#more broken, #more dead, #more arrived*)
  - Manner of death verbs encode non-gradable scalar change — death (cp. *#more dead/killed*):
 

(14) #more hung, #more drowned, #more electrocuted, #more suffocated

### 3 Manner encoding and manner of death verbs

- Manner has been a notoriously slippery category to define in the literature. RHL take perhaps the first serious and truly insightful stab at it, defining manner as non-scalar (non-measurable) change, informally defined as follows:
 

“A nonscalar change is any change that cannot be characterized in terms of an ordered set of values of a single attribute ... The vast majority of nonscalar changes deviate from scalar changes in another, more significant respect: they involve complex changes—that is a combination of multiple changes—and this complexity means that there is no single, privileged scale of change” (*ibid.*: 12)
- The intuition is that a manner is a complex sequence of (perhaps temporary) changes that define an action, such as the movement of arms and legs during running.
- Rappaport Hovav (2008) suggests that non-scalar verbs allow object deletion (see above).
- However, this diagnostic is inherently negative—it probes not being scalar change. Worse, it only diagnoses non-scalar change in the absence of scalar change, given that scalar change verbs disallow object deletion. It makes no predictions if a verb encodes both.
- We instead develop diagnostics for positively identifying manner/non-scalar change that can be used independent of whether a verb also lexicalizes a scalar change.

### Manner diagnostic # 1: Negation ambiguities

- First is to identify that a manner component exists at all. One way to find this — or indeed any subevental structure — is ambiguity under negation.
- Manner verbs are unambiguous under negation, showing only negated manner (keeping participants constant):

(15) Jim didn't run—he swam instead.  $(\neg [ x \text{ ACT } \langle \text{ROOT} \rangle ])$

- Caused change of state verbs are at least two ways ambiguous (Dowty 1979:Ch.5), showing negation of either the cause or the result, i.e. *not* can scope over either subevent:

(16) a. Jim didn't break the vase—you broke it.  $(\neg [ x \text{ CAUSE } [ y \text{ BECOME } \langle \text{ROOT} \rangle ] ])$   
b. Jim didn't break the vase—he fixed it.  $(\neg [ y \text{ BECOME } \langle \text{ROOT} \rangle ])$

- However, a predicate with all three should be at least three-ways ambiguous, as with template augmentation (Rappaport Hovav and Levin 1998:111, 118-123):

(17) Sue swept the floor clean.  $[ [ x \text{ ACT } \langle \text{SWEEP} \rangle y ] \text{ CAUSE } [ y \text{ BECOME } \langle \text{CLEAN} \rangle ] ]$   
a.  $\neg$ Manner: Sue didn't sweep the floor clean — she scrubbed it with a sponge!  
b.  $\neg$ Cause: Sue didn't sweep the floor clean — she swept it but it was clean already!  
c.  $\neg$ Result: Sue didn't sweep the floor clean — she swept it, but only ended up spreading the dust around more.

- Thus such predicates show a hybrid of the two above patterns. Crucially, manner of death verbs also show a hybrid of these patterns:

(18) a.  $\neg$ Manner: Bob didn't drown Ponyboy — he electrocuted him instead!  
b.  $\neg$ Cause: Bob didn't drown Ponyboy — he held his head under, but he really died of a heart attack due to shock!  
c.  $\neg$ Result: Bob didn't drown Ponyboy — he choked on the water and some got in his lungs, but he miraculously survived!

- The fact that negation can have scope over either manner (18a) or result (18c), shows that the verb has a meaning like (17), with manner and result.

### Manner diagnostic # 2: Denial of action

- Second is whether the agent performed an action. This involves finding entailments of appropriate generality, something difficult to do since actions are a very heterogeneous.
- We instead focus on a property that seems to be the canonical case of non-scalar change — temporary movement as part of performing an action as in *x didn't move a muscle*.
- With manner verbs, this leads to contradiction. With true result verbs, while there may be a strong implicature of action, in the right context it can be denied:

(19) a. #Jim ran/jogged/blinked, but didn't move a muscle.  
b. Jim destroyed his car, but didn't move a muscle — rather, he let it sit on his front lawn on cinder blocks until it disintegrated.

- Crucially, manner of death verbs pattern like manner verbs, i.e. they lexicalize manner, and context cannot save them:
  - (20) a. #Jo drowned/hanged/electrocuted/beheaded Al, but didn't move a muscle.
  - b. #The president crucified/electrocuted/hanged the prisoner, but didn't move a muscle — rather, he failed to issue a pardon/stop the executioner.
- This suggests that manner of death verbs also encode manner.

### Manner diagnostic # 3: Complexity of action

- RHL suggest that “the vast majority” of non-scalar changes are complex. Intuitively, this is hard to justify; semelfactives (*blink, jump, snap, tap, hit, click*) presumably have manner.
- However, we could restrict ourselves to verbs that involve complex sequences of unordered changes. To test for this, we follow Dowty (1979:170-171) (see also Rothstein 2004, Beavers 2008b): verbs with complex manners like *waltz* require non-trivial time intervals to verify.
- Thus complex non-scalar change should be durative. How can we tell?

- (21) a. **Durative atelic predicates:** *spend an hour*  
John spent five minutes running/jogging/exercising/playing.
- b. **Durative telic predicates:** *take an hour* → *during/after an hour*  
It took five minutes to carve/make/build the toy.
- c. **Punctual (telic) predicates:** *take an hour* → *after an hour*  
It took John five minutes to blink/jump/clap. (Kearns 2000, Beavers 2008b)

- Manner of death verbs are telic (they encode a result), and they pattern as durative, with the exception of beheading verbs which (with a sharp blade and a lot of force) could be punctual:

- (22) a. It took me five minutes to drown/hang/crucify Jim. (*during/after*)
- b. It took me five minutes to guillotine Jim (with one slice). (*after*)

- Since the result state itself — death — is non-gradable, it cannot contribute durativity. Thus the manner that leads to death (e.g. holding closed someone's windpipe, nailing them up to a cross) must be contributing to the durativity, and thus these are complex non-scalar changes.

### Manner diagnostic summary

- By our diagnostics manner of death verbs encode non-scalar change — they have a subevent beyond causation and result that makes the predicate durative and encodes motion.
- Since they pattern like both manner and result verbs, they must be encoding both notions.

#### 4 Beyond the seventh seal: Additional problems for complementarity

- Levin and Rappaport Hovav (2008) (LRH) address other verbs which also seem to encode manner and result, and in each case suggest they do not. We discuss one such class here.
- LRH (pp.10-12) claim that *climb* lexicalizes manner but has a conventionalized result “up”. Crucially, they argue, the verb *can* lexicalize the result, but only if it is “swapped out” with manner, a case of systematic polysemy that reflects the manner/result complementarity:

- (23) a. The plane climbed to a cruising altitude. (up, not clambering)  
b. Kelly climbed down from the roof. (clambering, not up)

- However, while it is true that many uses only have one or the other meaning at a time, some uses seem to categorically require both meanings simultaneously:

- (24) a. #John climbed the tree/slope/mountain, but not upwards.  
b.??John climbed the tree/slope/mountain in a helicopter.

- LRH argue that the direction comes from the ground object — it provides the scale. However, this predicts that there should be objects of climb which determine other directions.

- LRH give a few examples, including (25), where the direction is “over”:

- (25) 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) (over)

- However, “over” involves an “up” component, so this may not be a counterexample. A second counterexample is given in (26), where the direction is “down”.

- (26) ‘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; in LRH, p. 12)

- However, there is an *into* PP here, though LRH suggest that *into* is too general to add “down”.

- But the DP object of *into* must be also considered — here *into the rowing boat* supplies downwardness since this is the only way to enter a row boat.

- Crucially, all of LRH’s downward transitive examples involve an explicit directional PP. Without it, the only possible direction is up, suggesting that the object cannot determine arbitrary direction, as evidenced by (24a).

- Therefore at least some uses of *climb* encode some notion of upwardness as well as manner. A more complicated question is how to analyze this — is it just a three-way polysemy, or some compositional method for overriding default entailments? We leave this open.

## 5 Manner/result complementarity and the architecture of event structure

- Thus there seems to be empirical evidence against the complementarity. What are the theoretical consequences?

(27) RHL's (5) Lexicalization constraint

A root can only be associated with one primitive predicate in an event schema, as either an argument or a modifier.

- Manner verbs have a modifying root, while result verbs have an argument root.

(28) a. [ x ACT<sub><ROOT></sub> ]

b. [ [ x ACT ] CAUSE [ y BECOME < ROOT > ] ]

- Crucially, their discussion seems to presuppose that a lexeme has only a single root:

“assuming that manner roots modify the predicate ACT and result roots are arguments of BECOME, a root can modify ACT or be an argument of BECOME in a given event schema. A root cannot modify both these predicates at once without violating the lexicalization constraint” (RHL: 5-6).

- If manner of death verbs have both components, this counterexemplifies the claim. This seems, though, like it's not the only class that does. Levin (2008) points out that *mow* lexicalizes change and manner; our diagnostics concur:

(29) a. #John mowed the lawn, but nothing is different about it.

b. #John mowed the lawn, but didn't move a muscle.

- Levin argues that the change is non-scalar and thus does not count against (27). In particular, she gives the following judgment on *more mowed*, which can only refer to the quantity of the referent or the quality of the outcome, but not the degree of mowedness of the lawn.

(30) \*My lawn was more mowed than yours.

(cannot be used if my lawn is shorter than yours)

- Since there is a result entailment, there must be a BECOME subevent as well as the action; thus there must be *two* roots, albeit *both* non-scalar:

(31) [ [ x ACT<sub><mow></sub> y ] CAUSE [ y BECOME < mown > ] ]

- LRH's explanation of the manner/result complementarity hinges on (a) verbs lexicalizing only one root and (b) the root serving as either a modifier or argument, but not both.
- But the facts of *mow* (as suggested by LRH and the facts above) and the manner of death facts, show that some verbs have multiple roots.
- Furthermore, if we spell out the event structure more truth-conditionally, this seems a somewhat curious idea. Following (for example) Parsons (1990), RHL's "argument" roots are predicates of result states, while "modifier" roots are predicates of events.

(32)  $[[\textit{sweep clean}]] := \lambda y \lambda x \lambda e \exists v \exists s [\textit{actor}'(x, v) \wedge \textit{sweep}'(x, v) \wedge \textit{cause}'(v, e) \wedge \textit{become}'(y, s, e) \wedge \textit{clean}'(s)]$

- There is no a priori reason why a lexeme could not have two roots in this sense:

(33)  $[[\textit{mow}]] := \lambda y \lambda x \lambda e \exists v \exists s [\textit{actor}'(x, v) \wedge \textit{mow}'(x, v) \wedge \textit{cause}'(v, e) \wedge \textit{become}'(y, s, e) \wedge \textit{shorter}'(s)]$

- It can't be a constraint on only placing truth conditions on one type of eventuality. Caused change-of-state verbs impose constraints on causing and result eventualities simultaneously:

(34)  $[[\textit{break}]] := \lambda y \lambda x \lambda e \exists v \exists s [\textit{effector}'(x, v) \wedge \textit{cause}'(v, e) \wedge \textit{become}'(y, s, e) \wedge \textit{broken}'(s)]$

- So, we believe that standard assumptions about lexical meaning lead to the expectation that there should be verbs lexicalizing both manner and result.
- And, as shown above, there do seem to be such verbs.
- However, this is not to say that every combination is possible; we believe there is something to the complementarity.
- For example, we have seen two types of cases where there are two roots — *mow*, which takes two non-scalar roots, and manner of death/*climb*, which take a scalar and non-scalar root.
- But what about two scalar roots? Many of these may be independently ruled out: scalar roots define temporal measures of the event; two roots may prove contradictory (Tenny 1994).
- But, there may be verbs that lexicalize two scales, provided they essentially go hand in hand — with locative verbs the theme moves and covers/fills the location, so that the two perspectives on the event are two flip sides of the same measurement:

(35) a. John loaded the wagon with the hay. (hay moves, wagon fills up)  
 b. John loaded the hay onto the wagon. (all hay moves, wagon fills)

- We thus find verbal lexemes with roots of the following kinds:

(36) a. Single scalar root (*break, smash*)  
 b. Single non-scalar root (*run, walk, swim*)  
 c. Two non-scalar roots (*mow*)  
 d. Two scalar roots (*load*)  
 e. Two roots, one scalar and one non-scalar (manner of death verbs, *climb*)

- But not all scalar roots are equal. As discussed in §2, scalar change can be two-point (achievements) or multi-point. Scales are also associated with open (e.g., *red, warm, tall*) or closed (e.g., *flat*) scales (Kennedy and McNally 2005).
- If we consider the kinds of scalar roots that we find lexicalized with non-scalar roots, not all seem to be found (at least so far as we've been able to tell thus far):

(37) Types of scalar roots lexicalized with non-scalar roots

	<b>Two-point</b>	<b>Multi-point</b>
<b>open scale</b>	logically ruled out	<i>climb</i>
<b>closed scale</b>	manner of death	???

- Two-point scalar changes are closed scale by definition, and manner of death verbs fill in the binary closed scale class.
- That *climb* is multi-point open scale is evidenced by the fact that, sans a path object, there's no inherent boundary on upwardness, which could go on indefinitely, and it encodes a result immediately upon initiation:

- (38) a. Sandy/the plane is climbing → The plane has climbed.  
 b. The soup is cooling. → The soup has cooled.

- (With a path object *climb* acts more closed scale, but in this sense it is more like a complex predicate — its scale is not fully specified unless it is transitive, confirming LRH's point that the scale is at least partly determined by the object.)
- However, what seems not logically impossible, yet unattested best we can tell, is a single verb lexicalizing a non-scalar root and a multi-point closed scale scalar root.
- This would be something like *flatten* — categorically a closed-scale maximal endpoint deadjectival verb — with an additional non-scalar component, e.g., *flatten by hammering*, etc.
- The degree to which such verbs are rare or even impossible suggests, with LRH, that there may be constraints or preferences against certain types of double root verbs.
- Why, if true, that should be the case — either a semantic incompatibility or a more functional explanation — is a mystery to us at the moment.

## 6 Concluding remarks

- The point of departure for this paper has been the observation that manner of death verbs look like a class of verbs encoding both manner and death, thereby counterexemplifying the manner/result complementarity.
- In order to show this, we took LRH's definitions of manner (non-scalar change) and result (scalar change) and developed a battery of diagnostics for each, showing that manner of death verbs pass both sets.
- We further showed on the basis of these diagnostics and additional empirical considerations that alongside manner of death verbs, other verbs (e.g., *climb*) look like they have both manner and result components.
- It thus seems that alongside canonical manner (e.g., *run*) and result (e.g., *break*) verbs, which have a single root, there is a whole class of verbs that have two roots, a possibility not unexpected under standard model-theoretic views.

- The bigger question: Assuming that a single lexeme can have two roots, are all combinations possible?
- Consistent with LRH, the tentative answer seems to be no—we are unaware of verbs lexicalizing a non-scalar root and a multi-point closed scale scalar root, e.g., *flatten by hammering*.
- Whether some verb’s ass manages to fill this gap in the end remains to be seen.

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