Manner and Result in the Roots of Verbal Meaning

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Rappaport Hovav and Levin (2010) argue that verbs fall into (at least) two classes: result verbs (e.g., *break*) and manner verbs (e.g., *run*). No verb encodes both manner and result simultaneously, a truth-conditional fact that Rappaport Hovav and Levin argue follows from how verb meanings are composed at the level of event structure. However, a key issue in verifying this claim is isolating truth-conditional diagnostics for manner and result. We develop and review a number of such diagnostics and show that there are verbs that encode both meanings together, counterexemplifying their truth-conditional complementarity. However, using evidence from scopal adverbs, we argue that when the meanings occur together, they are encoded in a single, undecomposable manner+result root at event structure. This fact validates complementarity as a fact about how many and what types of roots may occur in an event structure, though it also argues for a richer typology of roots than is typically assumed, including those encoding manner and result simultaneously.

Keywords: event structure, roots, lexical semantics, scalar change, sublexical scope

1 Introduction

Since at least the early days of Generative Semantics, one of the primary concerns of lexical semanticists has been the question of possible and impossible verb meanings. In many ways, work in decompositional event semantics has been at the heart of this, whether in its lexicalist (Dowty 1979, Pinker 1989, Jackendoff 1990, Levin and Rappaport Hovav 1995, Van Valin and LaPolla 1997, Wunderlich 1997, Davis and Koenig 2000, Davis 2001) or nonlexicalist (Lakoff

1965, Hale and Keyser 1993, 1997, 2002, Pesetsky 1995, Baker 1997, Marantz 1997, Folli and Ramchand 2002, Harley 2003, Folli and Harley 2004, Ramchand 2008) guise. In such approaches, word meanings are assumed to at least partly consist of a grammatical level of representation often referred to as an ''event structure,'' which is built up from two major components: a small set of basic eventive predicates indicating causation (CAUSE), action (ACT), and change of state (BECOME), among others, and a much larger set of idiosyncratic lexical semantic roots that fill in the fine-grained, real-world details of these basic event types. These components are combined into complex event structures via a limited, well-defined event calculus. The limited set of basic event types plus the constrained nature of the event calculus determines that only some event structures are possible, and this predicts in turn that only certain verb meanings are possible.

For example, in the event structure typology outlined by Rappaport Hovav and Levin (1998: 108–109), only an individual or an action, not a change of state, can be a causer argument of a primitive CAUSE operator. This predicts the nonexistence of a verb *grimp* meaning 'x dying caused y to die', since the corresponding event structure is impossible.

(1) a. John grimped Mary.
    b. [[x BECOME ⟨dead⟩] CAUSE [y BECOME ⟨dead⟩]]

Still further, on some theories event structures are actual syntactic constituents built from functional heads denoting basic eventive predicates and morphological roots containing idiosyncratic information. On such theories, event structures are also subject to general syntactic constraints on constituency and movement, which may make additional predictions about possible event structures (an idea dating back to Generative Semantics; see, e.g., Dowty 1979:236ff. for discussion). The point is that some event structures are unattested because properties of the way they are constructed constrain possible verb meanings.

In this vein, Rappaport Hovav and Levin (2010) (henceforth RH&L) have recently discussed an interesting fact about possible verb meanings that they argue also follows from properties of event structures (based on observations dating back at least to Levin and Rappaport Hovav 1991). In particular, they claim that eventive verbs fall into (at least) two broad semantic classes: those encoding the manner in which some action is carried out, exemplified in (2a), and those encoding the coming about of some particular result state, exemplified in (2b).

(2) a. *Manner verbs*
       blink, jog, run, scrub, sweep, swim, walk, wipe, yell, etc.
    b. *Result verbs*
       break, clean, crush, destroy, dim, shatter, etc.

RH&L (p. 25) crucially claim that no single verb encodes both meanings at the same time. Instead, the manner in which something comes to be in some state is unspecified for result verbs—a breaking can be accomplished in any number of manners (snapping, slapping, etc.)—while the result is unspecified for manner verbs—one can run around and end up back where one started (or run in place). Of course, a complex predicate consisting of two separate lexemes can encode

manner and result simultaneously (e.g., resultatives such as *sweep clean*). RH&L's claim is that a single, monomorphemic lexeme never encodes both.

RH&L propose that this complementarity follows from how event structures are composed, focusing on the number, type, and place of lexical semantic roots. A single lexical semantic root can either modify an underlying ACT predicate, as in (3a), or be an argument of an underlying BECOME, as in (3b), but not both, ruling out (3c). Furthermore, RH&L's discussion presupposes that there is only ever one root per lexeme, also ruling out (3d).

(3) a. [x ACT$_{\langle\text{ROOT}\rangle}$]
     b. [[x ACT] CAUSE [y BECOME $\langle$ROOT$\rangle$]]
     c. *[[x ACT$_{\langle\text{ROOT}\rangle}$] CAUSE [y BECOME $\langle$ROOT$\rangle$]]
     d. *[[x ACT$_{\langle\text{ROOT}_1\rangle}$] CAUSE [y BECOME $\langle$ROOT$_2\rangle$]]   (in a single verb)

This predicts that no event structure will ever have both result and manner roots simultaneously, explaining why no verb seems to encode both meanings simultaneously.

This claim has implications beyond just verb classification and a theory of event structures. For example, Beavers, Levin, and Tham (2010) suggest that Talmy's (1972, 1985, 2000) well-known typology of directed-motion constructions—distinguishing languages in which path of motion versus manner of motion is encoded in the verb—may be partly explained by manner/result complementarity, taking directed paths to represent a kind of result. Talmy's typology in turn correlates either significantly or categorically with other typological facts, including the possibility of secondary result predication (Aske 1989; though see Son 2007) and relative numbers of manner or result verbs in lexical inventories (Wienold 1995, Slobin 2000). Thus, complementarity, if true, may have relatively broad implications.

We examine the empirical and theoretical foundations for RH&L's proposal, and more broadly what it means for a verb class to be impossible owing to properties of event structures. We argue that the manner/result complementarity question has been complicated by the use of diagnostics for manner and result as components in a verb's meaning that are (a) interdependent in ways that make them inappropriate for verifying complementarity, and (b) not linked to either truth-conditional or event-structural semantics in an explicit way. Thus, a significant portion of this article consists of devising independent truth-conditional diagnostics for identifying manner and result in a verb's meaning, and comparing them to standard diagnostics—in particular, scopal operators (Dowty 1979, von Stechow 1995, 1996, 2003, Marantz 2007, 2009)—that probe for event structure. We argue that once the diagnostics are so delineated, the question of manner/result complementarity in fact becomes *two* questions, one about truth-conditional content and one about event structure.

Crucially, we show that in truth-conditional terms—that is, what lexical entailments a verb encodes in the sense of Dowty 1989:75—there is evidence *against* manner/result complementarity. We focus on manner-of-killing verbs like those in (4) (Krohn 2008), which we argue encode both a result state (of death or a state that conventionally leads to death) and specific manners of bringing it about, as first noted in passing by Dowty (1979:203–204).

(4) Shane drowned/hanged/electrocuted/crucified Sandy.

However, we also use evidence from scopal modifiers to show that verbs cannot have both a manner root and a separate result root simultaneously, so that manner/result complementarity does hold as a fact about event structures. To accommodate truth-conditional manner + result verbs, there must therefore exist a class of manner+result roots in which manner and result meanings are ''packaged together'' as a single unit. This partly calls into question the truth-conditional predictions of event-structural approaches, since what truth-conditional predictions such a theory makes will depend on a well-developed typology of possible roots (a point Dowty (1979:125–129) also makes). But it also points toward a more refined way of making claims about possible and impossible verbs, distinguishing claims about truth-conditional content from the way that content is packaged in a verb's meaning.

We begin in section 2 by defining the classes of result verbs, manner verbs, and manner-of-killing verbs. In section 3, we look at diagnostics for result in a verb's meaning, and show that manner-of-killing verbs pattern like standard result verbs. In section 4, we turn to manner diagnostics and show that manner-of-killing verbs also pattern like manner verbs. We thus conclude that they are manner + result verbs, counterexemplifying the truth-conditional complementarity claim. In section 5, we show that similar facts hold for some manner-of-cooking verbs (e.g., *braise*, *sauté*) (Levin 1993:243) and ditransitive ballistic motion verbs (e.g., *throw*, *toss*) (Gropen et al. 1989:243–244). In section 6, we examine complementarity in event structures and use evidence from scopal operators to suggest that in manner + result verbs the two meaning components are packaged into a single scopal unit, rather than two separate roots, yielding a type of complementarity, albeit one requiring a class of manner + result roots. We conclude in section 7.

At the outset, we offer two terminological preliminaries. First, the term *root* is ambiguous in the literature, referring either to a morphological root or to a lexical semantic object in an event structure. In lexicalist theories of event structure, lexical semantic and morphological roots do not necessarily correspond to one another, but in syntactic theories, such as those in the Distributed Morphology tradition, they do. Nothing we say hinges on whether this correspondence holds, but for clarification, we use the term *root* in the sense of a lexical semantic root unless noted explicitly. Second, we take a *lexeme* to be minimally the association of a monomorphemic morphological root and a single event structure (however complex). A given morphological root may be polysemous, associated with multiple event structures. But RH&L's manner/result complementarity is a constraint on individual event structures, and thus for convenience we reserve the term *lexeme* for a pairing of a morphological root with a single event structure (we return to polysemy briefly in section 4.4).

2 Verbs of Killing: A Typology

Among the verb classes in Levin's (1993) encyclopedic classification are ''verbs of killing'' (pp. 230–233), which Levin divides into two subclasses. First are *murder* verbs, which ''all describe killing. . . . None of the verbs in this class lexicalizes a means component; that is, none provides any information about how the killing came about'' (p. 231). (A reviewer doubts *immolate* belongs here; we concur, but leave it for completeness.)

(5) *Levin's* murder *verbs*

   assassinate, butcher, dispatch, eliminate, execute, immolate, kill, liquidate, massacre, murder, slaughter, slay

Second, *poison* verbs ''relate to actions which can be ways of killing. Thus they each lexicalize a means component, and it is this means which differentiates among them'' (p. 232).

(6) *Levin's* poison *verbs*

   asphyxiate, crucify, drown, electrocute, garrotte, hang, knife, poison, shoot, smother, stab, strangle, suffocate

Levin herself observes that her initial observations and classification may oversimplify things, particularly for *poison* verbs, remarking that ''[i]n principle, as means verbs, these verbs need not entail that the action they denote results in death; however, some of them do appear to have this entailment'' (p. 232). What we aim to demonstrate is that at least some *poison* verbs do indeed entail both manner and result, namely, death or a state that can lead to death. We call these *manner-of-killing verbs*, which include those in (7).

(7) *Manner-of-killing verbs*

   crucify, drown, electrocute, guillotine, hang

   We first develop a suite of result and manner diagnostics, motivated by comparing their application to supposedly canonical result and manner verbs (see, e.g., (2)) and showing that they draw a distinction. For result verbs, we use *break*, *clean*, *destroy*, *dim*, and *shatter*, and for manner verbs we use unergatives *blink*, *jog*, *run*, and *yell* and transitive surface contact verbs *scrub*, *sweep*, and *wipe*, all of which we take to be uncontroversially result or manner verbs. We then apply our tests to manner-of-killing verbs and show that they pass all of the tests and thus represent manner + result verbs. However, as we discuss below, prior classifications of manner and result verbs may have been built on diagnostics that *preclude* the possibility of manner + result verbs; thus, verbs previously classified as either manner or result may actually be manner + result verbs. Our goal is not to ''redo'' prior classifications; rather, it is to demonstrate the existence of a third, mixed class.

   Before proceeding, we briefly motivate the need for such a discussion. It may seem obvious that a verb like *guillotine* gives rise to noncancelable inferences of both a result and a means of achieving it. However, as RH&L's proposal makes clear, this is not necessarily so. Perhaps only manner *or* result is encoded, and the other is inferred through some process of conventionalization (the stance taken in, e.g., Levin and Rappaport Hovav 2008). Or perhaps *guillotine* is polysemous between manner and result uses, giving rise to the impression that it encodes both (as both a reviewer and Beth Levin (pers. comm.) suggest). Alternatively, *guillotine* could encode both meaning components, but they are different from those found in canonical manner and result verbs. If event structures constrain noncancelable verbal meanings and are constructed in ways that predict complementarity between two specific meaning components, it is an important question whether the meanings associated with supposed manner + result verbs really are the same as

those in manner and result verbs, and thus we devote some time to this. We consider the various alternatives again in section 4.4.

3 Result Meanings and Manner-of-Killing Verbs

We begin by looking at result diagnostics. First, it is important to define what is meant by a result. Since we are specifically addressing RH&L's claim of a manner/result complementarity, we adopt their notion of a result, wherein result verbs are those 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. (RH&L, p. 28)

Thus, having a result means encoding some change measured along a scale of possible values in some property of the patient (see also Krifka 1998, Hay, Kennedy, and Levin 1999, Kennedy and McNally 2005, Beavers 2008, 2011b, Kennedy and Levin 2008, and Rappaport Hovav 2008 for various formalizations and further discussion).[1] Beavers (2008) (building on Tenny 1992, 1994, Hay, Kennedy, and Levin 1999) proposes that scalar change verbs fall into three broad classes: change along a property scale (e.g., *break*, *cool*, *warm*), change along a path (i.e., motion; e.g., *enter*, *exit*, *walk to*), and creation/consumption (i.e., change along a volume or existence scale; e.g., *build*, *drink*, *eat*). The canonical examples of scalar change verbs are deadjectival ''degree achievement'' change-of-state verbs such as *warm* in (8), where the soup undergoes a change along a totally ordered temperature scale of degrees of warmth.

    (8) I warmed the soup ≈ the degree of warmth of the soup increased.

At the end of the event, the degree of warmth of the patient is greater along the temperature scale. However, although RH&L give this definition of result, they do not systematically lay out diagnostics for resulthood rooted in it. We develop three such tests below, showing along the way that manner-of-killing verbs pass these tests and thus are result-encoding.

3.1 Result Diagnostic #1: Denial of Result

In an event of change along a scale ϕ, the patient necessarily has a different degree of ϕ at the end of the event than the beginning. Therefore, it should be contradictory to follow any predicate headed by a result verb with a denial that the patient has undergone a change in some named property. As Beavers (2011b) suggests (following Kratzer 2000), one test is to see if denying the past participle form of the verb applied to a DP coreferential with the putative patient yields a

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[1] This definition is of course relational, involving a scale and a patient. It does not matter whether the patient is realized as a subject or an object, and thus we do not distinguish subjects and objects below in terms of the acceptability of our result diagnostics, unless a particular diagnostic makes explicit reference to a certain grammatical function.

contradiction, as shown with uncontroversial result verbs in (9) (where the pronoun is to be interpreted as coreferential with the argument being tested for patientivity, here the object in the first clause).[2]

(9) a. #Shane just broke the vase, but it is not broken.
     b. #Shane just shattered the bottle, but it is not shattered.
     c. #Shane just destroyed his house, but it is not destroyed.

However, it could be argued that this diagnostic does not show that all of these verbs encode the *same* notion of result. Thus, we might instead find some single, non-verb-specific inference for all result verbs. Beavers suggests *something is different about x* for property change and creation/consumption predicates, where *something* is interpreted as an intrinsic physical property (Wolff (2003:41) gives *something happened to x*, citing Shibatani 1976; Beavers gives *x is somewhere else* for motion verbs; see section 5.1). As (10a–c) show, denying this also gives rise to a contradiction with canonical result verbs.

(10) a. #Shane just broke the vase, but nothing is different about it.
      b. #Shane just shattered the bottle, but nothing is different about it.
      c. #Shane just destroyed his house, but nothing is different about it.

By contrast, prototypical manner verbs fail to generate a contradiction with continuations that deny a result. Precisely this point is discussed for surface contact verbs such as *rub*, *sweep*, and *wipe* by Rappaport Hovav and Levin (1998:101), who remark that

> none of these verbs, in its most basic use, entails a resulting change in the contacted surface. Thus, although a floor is typically swept in order to remove dirt and debris, a floor that is swept need not end up being clean. Although a hearer will infer that a swept floor is a clean floor because the conventional goal of sweeping is to clean a floor, there is nothing contradictory in saying *Tracy just swept the floor, but there are still crumbs on it.*

Of course, their continuation is a specific one pertaining to specific verbs (cf. result participles above). But the more general *but nothing is different about x* has the same effect, as in (11), and similarly with other canonical manner verbs such as unergatives, as in (12).

(11) a. Tracy just swept the floor, but nothing is different about it.
      b. Tracy just wiped the floor, but nothing is different about it.

(12) a. Bob just yelled, but nothing is different about him.
      b. Bob just ran quickly, but nothing is different about him.

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[2] We use *just* in the initial clause to militate against the change being done and then subsequently being undone; Kratzer (2000) uses instead *x is still VPed*. Since we are interested in the semantic contribution of the verb to the clause, we avoid negation and modal operators that would obscure the relevant outcome.

Thus, unsurprisingly, canonical result verbs, but not canonical manner verbs, have a result entailment.[3] Note that these diagnostics are insensitive to manner encoding; a verb passing one of these tests may also encode manner, a point that will be relevant in section 4.

Turning now to manner-of-killing verbs, the examples in (13) show that these verbs generate a contradiction in this frame, patterning with canonical result verbs.

(13) a. #Jane just drowned Joe, but nothing is different about him.
     b. #Jane just hanged Joe, but nothing is different about him.
     c. #Jane just crucified Joe, but nothing is different about him.

Thus, manner-of-killing verbs have a result component. What exactly the result is is not important, though we believe it to be death. Our claim—that these verbs encode both a manner and a result—is valid so long as they encode *some* result, death or otherwise. For example, our intuitions are that one cannot survive a guillotining, but if for example a zombie can, then it has still lost its head (or some appendage; see footnote 9) and thus there is still a result. Similarly for *crucify*: while we have strong intuitions that death must ensue, were one to claim it did not, there is still a change of location (being hung up in a particular configuration) and thus a result. One verb that evokes more equivocation is *electrocute*. We and other speakers we have consulted believe it must describe death, while many others (including one reviewer) have suggested it has a meaning more like 'shock', with no particular result state (the *OED* offers both definitions). For the latter set of speakers, it is simply not a result verb. Thus, although speakers may disagree on the exact result, except for *electrocute*, there is no disagreement that *some* result obtains.

3.2 Result Diagnostic #2: Object Deletion

Our second diagnostic is actually a set of related tests that make up the bulk of those adopted by RH&L: namely, that transitive manner verbs, but not transitive result verbs, permit their objects to be omitted in certain contexts. RH&L do not themselves link this directly to scalar change, but Rappaport Hovav (2008:24) proposes that scalar change verbs disallow object deletion since ''scales require that the participant whose property is measured out by them is overtly realized.'' This condition may follow from Rappaport Hovav and Levin's (2001:779) Argument-per-Sub-event Condition, whereby there must be at least one overt argument for each distinct subevent

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[3] A reviewer questions this test with surface contact verbs, giving judgments like #*Bob just dusted/polished/scratched/scrubbed the table, but nothing is different about it*. However, we reiterate our comment in section 2 that if a verb previously classified as a manner or result verb does not pattern as such according to our tests, the original classification may be incorrect. That said, regarding these specific verbs, *dust* could be lexicalized differently for different speakers, with a result meaning 'to remove dust from' or a manner meaning 'to touch with a duster' (or even 'to remove dust by touching with a duster'), and similarly for *scrub* and *polish* (though to us the former is a manner verb and the latter a result verb). As for *scratch*, we believe that there are two homophonous lexemes, one that takes inanimate objects and refers to the result of producing a scratch, and one that takes animate (body part) objects and refers to a manner of skin contact. (See also Washio 1997:12–16 for a similar point about *wipe* verbs in Japanese, where 'removal' and 'surface touching' senses are lexicalized into different, nonhomophonous verbs.) What matters to the present discussion is simply that some verbs pattern one way with these diagnostics and others a different way.

in the verb's event structure. If scalar change involves a change-of-state (BECOME) subevent of which the patient is the sole participant, then it must be realized (see Rappaport Hovav and Levin 1998:122 for an earlier argument along these lines). Conversely, since transitive manner verbs do not encode scalar change, there is no additional subevent beyond the manner (ACT), and the object may be deleted.

The facts bear this out. An uncontroversial manner verb such as *scrub* in (14a) may occur intransitively as in (14b), giving rise to an existentially bound reading for the patient.

(14) a. Kim scrubbed the floor.
     b. All last night, Kim scrubbed.

A second object deletion context involves *out*-prefixation, as illustrated in (15), wherein the default patient object is replaced by an object representing the agent of another event.

(15) a. Cinderella scrubbed the floor.
     b. Cinderella outscrubbed her stepsisters.

Conversely, result verbs do not allow object deletion (the intended reading of the (b) sentences is object deletion, not inchoative—that is, subject deletion plus object promotion).

(16) a. Kim broke the vase.
     b. *All last night, Kim broke.

(17) a. Kim shattered the can.
     b. *All last night, Kim shattered.

(18) a. Kim destroyed the house.
     b. *All last night, Kim destroyed.

Similarly, although our judgments are less sharp, result verbs are also odd with *out*-prefixation.

(19) a. ??Kim outbroke the other vase-smasher.
     b. ??Kim outshattered the other bottle-shatterer.
     c. ??Kim outdestroyed the experienced wrecking crew.

Thus, this test separates canonical result and manner verbs, and, since it probes only for a result, is insensitive to whether manner is also encoded; we return to this in section 4.

Like result verbs, manner-of-killing verbs disallow object deletion and *out*-prefixation.[4]

(20) a. *All last night, Shane crucified.
     b. *All last night, the executioner electrocuted.
     c. *All last night, Shane drowned.   (on intended reading)

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[4] Our judgments are again not that sharp, though this is true also for canonical result verbs as in (19). Therefore, such muddled judgments do not argue against our point, but perhaps call into question *out*-prefixation as a diagnostic.

(21) a. ?My executioner can outdrown your executioner's sorry ass any day.
     b. ?My executioner can outhang your executioner's sorry ass any day.
     c. ?My executioner can outcrucify your executioner's sorry ass any day.

These verbs thus pattern like canonical result verbs, suggesting that they too encode a result.

3.3 Result Diagnostic #3: Restricted Resultatives

Another diagnostic involves the range of possible resultative constructions the verb may appear in, with respect to which manner verbs are generally less constrained than result verbs. For example, Rappaport Hovav (2008:22) 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.''[5] This follows if result XPs denote states on scales that must be compatible with the scale determined by the verb (following Wechsler 2005a, Beavers 2008). This is illustrated in (22), where the manner verb *scrub* allows a range of result XPs predicated of the default object of *scrub* as in (22a), plus XPs predicated of nonsubcategorized objects as in (22b–d).

(22) a. Cinderella scrubbed the table clean/shiny/bare.
     b. Cinderella scrubbed her knees sore.
     c. Cinderella scrubbed the dirt off the table.
     d. Cinderella scrubbed her housecleaning competitors out of business.

This contrasts with the behavior of result verbs like *dim*. While such verbs do allow result XPs, they must be compatible with the result encoded already in the verb, as in (23a–b) for *dim*. Similarly, result XPs with nonsubcategorized objects are generally not allowed, as in (23c).[6]

(23) a. Then the biologists dimmed the room to the level of starlight . . .
         (Rappaport Hovav 2008:23, (13d))
     b. *We dimmed the room empty.
         (Rappaport Hovav 2008:23, (13e))
     c. *Kim dimmed her eyes sore.

There is nothing pragmatically implausible about (23b) or (23c). There could be situations in which one clears a room by dimming the lights until everyone leaves, or where dimming the light strains Kim's eyes to the point of soreness. But these situations cannot be described by (23b–c). Other uncontroversial result verbs such as *break* are similar. For example, result XPs that are

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[5] This distinction bears some similarity to Washio's (1997) proposal that resultative constructions be split into what he calls ''strong'' and ''weak'' resultatives, the former roughly those that occur with verbs that do not independently entail a result, the latter with those that do. Among ''weak'' resultatives, the possible result XPs may be constrained by what change the verb already encodes (see also Beavers 2011b).

[6] A reviewer notes that such examples may be acceptable in other languages, citing Mandarin as a possibility. We agree that it is an open question whether this test generalizes across languages, but we focus on English here.

compatible with the encoded result are acceptable, as in (24a–b), but result XPs that are not are unacceptable, as in (24c–e), as are results with nonsubcategorized objects, as in (25).[7]

(24) a.   Kim broke the stick in half.
    b.   Kim broke the stick into pieces.
    c. #Kim broke the stick across the room.
    d. #Kim broke the stick purple.
    e. #Kim broke the stick into the ground.

(25) *Kim broke her knuckles sore (by breaking the glass with her fist).

This suggests that these verbs already encode specific results, ruling out many result XPs. That said, Beavers (2011b) notes (in contrast to the stronger statement from Rappaport Hovav 2008 above) that result verbs vary in how many result XPs are possible, so that *cool* allows only degrees of temperature while *cut* allows a range of outcomes, including degrees of being cut up but also shapes—in other words, things that are not simple states of being cut to some degree but follow from or are connected to them. Beavers also suggests that certain manner verbs—surface contact and impact verbs such as *hit* and *kick*—also encode latent scales that limit result XPs (building on Tenny 1992:20, (42); see also Simpson 1983:151), although the constraints are rather loose. The key point again is that result verbs as a class tend to have more constraints than manner verbs, and in some cases the constraints are rigid.

    Manner-of-killing verbs pattern like result verbs on this diagnostic, in that the result XPs they occur with are more restricted. While they can take result XPs (redundantly) specifying death, as in (26), they cannot take result XPs that specify other end states, as in (27), despite the pragmatic plausibility of these sorts of manner + result combinations.

(26) a. Faulty ground wires in a building electrocuted him to death in 2004.
       (buzz.yahoo.com/article/1:y_news:31f4c8213ef1e2e4e5ae60d75a00b97f)
    b. When he came, his semen short circuted (*sic*) the sander and electrocuted him dead.
       (www.zcultfm.com/~comic/viewtopic.php?t = 27769&f = 2&view = previous)

(27) a. #Shane electrocuted the prisoner to a crisp.[8]
    b. #Shane drowned Sandy blue.
    c. #Shane hanged the prisoner thin.
    d. #The Romans crucified Jesus to the tomb.

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    [7] Although RH&L and Rappaport Hovav (2008) do not discuss this, there do appear to be a limited set of cases where result verbs indicating damage allow nonsubcategorized objects in the context of result XPs indicating separation, such as *John broke the branch off*, where the branch comes off rather than being broken per se. However, this does require the existence of a larger entity that is now broken as a result, and the direct object must be a subpart of this entity. Otherwise, nonsubcategorized objects in general are not possible.
    [8] A reviewer who judges *electrocute* to mean 'shock' (i.e., to be a manner verb) finds *electrocute* acceptable with nondeath result XPs, giving the (naturally occurring) *Spider-Man has to fight Rhino in a generator room, defeating him by making him smash into six generators that electrocute him into submission* (en.wikipedia.org/wiki/Rhino_(comics)). For such speakers, this is the expected behavior. Another reviewer finds *electrocute to a crisp* acceptable, though this may again be a 'shock' reading.

Likewise, manner-of-killing verbs do not permit nonsubcategorized object result XPs.[9]

(28) a. #Shane electrocuted the handle right off the wall.
b. #Shane drowned Sandy's lungs totally full of water.
c. #Shane hanged the noose off.
d. #The Romans crucified the cross in half.

Thus, manner-of-killing verbs again behave like uncontroversial result verbs.

3.4 Interim Summary: Manner-of-Killing Verbs and Result Diagnostics

We have reviewed several truth-conditionally-based diagnostics for result, all based to some degree on the definition of result as scalar change, and all technically independent of whether any given verb also encodes a manner. Crucially, the diagnostics all indicate that manner-of-killing verbs encode a result, though we have not yet shown that they also encode a manner. However, before turning to this, we briefly consider whether we can be more specific about what kind of scalar change manner-of-killing verbs encode. Not all scalar changes are identical. Indeed, there are in general two major types of scalar changes (Kennedy and McNally 2005:346–347, Beavers 2008:250–251). In simplex changes, the scale consists of just two values for property ϕ ($\neg\phi$ and ϕ), and the patient transitions from one to the other. States on two-point scales are associated with the category of nongradable adjectives, which are distinguished as being relatively incompatible with comparative morphology, as in (29a). In complex changes, the scale consists of more than two values, indicating different degrees of ϕ. States on these scales are associated with the category of gradable adjectives, which are readily compatible with comparative morphology, as in (29b).

(29) a. *Nongradable*
         arrive, break, pregnant (cf. #more arrived/broken/pregnant)
b. *Gradable*
         cool, dry, flatten (cf. cooler, drier, flatter)

Using gradability of the deverbal adjective as a diagnostic, (30) shows that manner-of-killing verbs encode change along a two-point scale—in other words, nongradable scalar change.

(30) #more crucified, #more drowned, #more electrocuted, #more hung

This is not surprising: these verbs encode death, and dying is generally viewed as nongradable change (e.g., #*more dead/killed*). We do not dwell on this further here, though it will be important in section 4.3 in defining a manner diagnostic related to durativity.

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[9] As a reviewer points out, this is expected of any verb that does not allow object deletion: if the object is nondeletable, then we also do not expect it to be replaceable. That said, as another reviewer points out and as noted above, it is possible to say *The executioner guillotined the man's arm off*, demonstrating that the same sort of part/subpart nonsubcategorized object property seen with *break off* in footnote 7 is possible with these verbs as well. This in fact further supports the claim that manner-of-killing verbs are like result verbs.

4 Manner-Encoding and Manner-of-Killing Verbs

Having shown that manner-of-killing verbs encode a result, we now show that they also encode manner and are therefore manner+result verbs, counterexemplifying the truth-conditional complementarity hypothesis. Once again, to stay as close to RH&L's work as possible, we adopt their definition of manner as nonscalar (i.e., nonmeasurable) change (RH&L, p. 32).

> 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.

Thus, a manner is a complex sequence of separate changes that collectively define an action, but do not necessarily add up to a single cumulative change along any one dimension. Furthermore—and RH&L do not make this explicit—these changes are presumably also only temporary, in that there is no entailment that any subset of them holds at and/or persists beyond the end of the event. Otherwise, it would be difficult to defend the position that they do not constitute a result. Perhaps a paradigm example of nonscalar change is the movement of arms and legs during running: the various movements of the limbs do not add up to any one particular change along any one specific scale, and the position of the limbs could well be exactly the same at the end of the event as at the beginning. Thus, manner and result can be seen as forming a dichotomy of types of changes: nonscalar versus scalar.

However, while this definition of result admits a relatively coherent unifying factor—change along a scale—it is not so clear what single positive diagnostic might unify *all* manners on this definition, as manners presumably include not just types of physical motion but also ways of speaking, making noise, emitting light, and even sitting still. This issue is addressed neither by RH&L nor by Rappaport Hovav (2008), and it points to the need for further, more explicit work on what exactly manner is. Nonetheless, since our goal is to investigate manner/result complementarity based on RH&L's criteria, we stay with their definition as is (which is sharp enough to have some empirical consequences). The challenge lies in finding diagnostics for manner as a unified category, given the heterogeneity of nonscalar change.

Rappaport Hovav (2008:23) proposes that manner verbs can be picked out by acceptability with object deletion: since result verbs disallow object deletion, manner verbs must allow it (see section 3.2). However, this is an erroneous conclusion. First, object deletion is supposedly licensed by *not* encoding scalar change, which is not the same as encoding *non*scalar change; in other words, it is not positively associated with manner. Second, taking object deletion also as a manner diagnostic means that it can only pick out manner in the *absence* of result; a verb that encodes *both* should not permit object deletion by virtue of encoding result, despite also encoding manner. In other words, this test as originally formulated presupposes a binary contrast, taking for granted the existence of only two verb types. But we are interested in a three-way contrast between result verbs, manner verbs, and manner+result verbs. Thus, if we accept obligatory objects as a positive result diagnostic, as we do, we need separate diagnostics for manner. We develop three such diagnostics below.

4.1 Manner Diagnostic #1: Selectional Restrictions

First, if a transitive verb has a manner component in its meaning, then it imposes selectional restrictions on its subject. Result verbs can also have restrictions on their subjects, but they impose fewer than transitive manner verbs, permitting inanimates and natural forces as well as animates. Manner verbs, by contrast, generally do not permit natural forces or inanimates (with the exception, in the latter case, of inanimates that are interpretable as animate, as with certain machines, or as instruments under the control of some agent, as with a reviewer's *I like how this mop scrubs the floor*). This contrast between result and manner verbs follows if result but not manner verbs require no specific action of their subjects.[10]

(31) a. John broke/shattered the vase with a hammer.
     b. The hammer broke/shattered the vase.
     c. The earthquake broke/shattered the vase.

(32) a. John scrubbed/wiped the floor with a stiff brush.
     b. #The stiff brush scrubbed/wiped the floor.
     c. #The earthquake scrubbed/wiped the floor.[11]

This test has also been proposed by Van Valin and Wilkins (1996:310) for identifying agentivity in a verb's meaning, a notion presumably related to manner, and in the causative/inchoative alternation literature as a determinant of which causatives have inchoative forms, namely, those that impose no conditions on their subjects other than causation (as in *The rope snapped/*cut*; see, e.g., Guerssel et al. 1985, Hale and Keyser 1987, Haspelmath 1993, Levin and Rappaport Hovav 1995, Van Voorst 1995, Reinhart 1996, 2002, Koontz-Garboden 2009).[12]

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[10] For simplicity, we restrict this test to transitive result verbs, where we assume that selectional restrictions relating to manner will be imposed on the causer subject, indicating the type of action that caused the change, though in principle such restrictions could also be imposed on the object (see, e.g., the event structures of Rappaport Hovav and Levin 1998: 113). As Fillmore (1970:128–129) notes, patienthood may also involve selectional restrictions, but for transitive result verbs these will be localized to object position and thus should have no effect on the choice of subject. However, this test cannot distinguish intransitive result and manner verbs, since all selectional restrictions of any sort will (of necessity) be imposed on their single arguments.

[11] A reviewer suggests that (32c) might be independently disallowed by a more general constraint that lexical causatives encode ''direct causation'' (building on Bittner 1999:12), where an earthquake cannot directly cause scrubbing or wiping without some intervening chain of events. We disagree; a plausible direct causation scenario would be one in which a towel was on the floor and the earthquake caused it to move around, thereby scrubbing/wiping the floor. In this case, it is still odd to say (32c). Rather, *wipe* and *scrub* involve a particular method of applying the instrument to the patient. (See Wolff 2003, however, for evidence that direct causation is not categorically required for lexical causatives, as Bittner (1999:2) herself suggests.)

[12] A reviewer does wonder if result verbs may have some constraints nonetheless, giving for example ???*John's right arm/hand broke the vase* (judgment is the reviewer's). We do not find this example unacceptable, and attested cases are not difficult to find (e.g., *Finally, on the fourth try, his left arm broke the glass*; http://articles.sun-sentinel.com/ 1995-07-01/news/9507010108_1_car-plunge-canal-police-officers). Nonetheless, as noted above, it may be that some verbs previously classified as result verbs do have manner components, at least for some speakers.

Manner-of-killing verbs, like manner verbs, disallow inanimates and natural forces.

(33) a.   John hanged/crucified Jesus with sailing rope.
      b. #Sailing rope hanged/crucified Jesus.
      c. #The wind hanged/crucified Jesus (by opening the trap door/raising his cross).

(34) a.   The revolutionaries guillotined the queen with a rusty blade.
      b. #The rusty blade guillotined the queen.
      c. #The heavy wind guillotined the queen (by loosening the blade).

Thus, manner-of-killing verbs place restrictions on their subjects, just like manner verbs.

4.2 Manner Diagnostic #2: Denial of Action

A more direct way to diagnose manner would be to look for inferences that follow from verbs encoding it. We could look at verb-specific inferences, as we did in section 3.1 with past participles of specific result verbs. For example, with *run* or *blink* it is straightforward to isolate particular manners that cannot be denied in each case (e.g., #*John ran, but did not move his arms and legs* or #*John blinked, but did not move his eyelids*). Conversely, with *break* or *destroy* it is harder to isolate such an action (e.g., *John broke/destroyed the vase, but didn't move his arm/drop it off a ledge/kick it with his foot/etc.*). However, like the past participle test, this approach is potentially open to the criticism that we have not shown that the relevant noncancelable inferences for each verb constitute the *same* notion of manner. So we might look for some single, non-verb-specific inference that holds for all manner verbs—in other words, the manner equivalent of *something is different about x*.

Unfortunately, as noted above, manner is a very broad category and is unlikely to have a single set of inference patterns associated with it. Thus, we take on a more modest goal: to identify a class of manner+result verbs, it is sufficient to isolate just one type of manner, and if a verb encodes this as well as a result, then we can conclude that manner+result verbs exist. We therefore focus on intuitively the most canonical type of manner: moving various parts of the human body in exhibiting a certain action (e.g., in forming some physical pattern or manipulating an instrument), which for convenience we call being an ''actor.'' This implies change (i.e., movement), but it is not scalar since it may involve sequences of unrelated movements and no lasting effect. If someone is an actor, it should be impossible to assert that this person performed the action specified by the verb and yet *didn't move a muscle*. As expected, prototypical actor-oriented manner verbs, such as manner-of-motion verbs as in (35), are contradictory in this frame, showing that they encode actor-oriented manner.

(35) #Jim ran/jogged/blinked, but didn't move a muscle.

By contrast, if all that result verbs encode is a result, not (any specific type of) action, then it *should* be possible to deny that action occurred. But, focusing again on manner of causation, how can one cause something without acting in some way? It is not our goal to outline a general theory of causation, but an example might be negligence—failing to act in some (expected) way

to prevent a change from occurring, thereby being responsible for it. In fact, exactly such a type of causation is subsumed under the force-dynamic model of causation proposed by Talmy (1976, 1988, 2000), later expanded on by Wolff (2003, 2007), Wolff and Song (2003), and Wolff, Barbey, and Hausknecht (2010), who propose a typology of causation types that invokes not just a notion of causation by action (CAUSE), but also a notion of causation by aiding and letting (ENABLE) for cases where a change is in progress and the ''enabler'' does not stop it and/or aids it in its progress. Negligence falls under an ENABLE-type causation that Talmy (2000:420–421) calls ''extended letting'' (giving *The plug's staying loose let the water drain from the tank*), wherein some causer that could stop some patient from changing nonetheless remains disengaged from the ongoing change.[13] Of course, not every failure to prevent something is causation; as Talmy (2000:477) points out, *I emptied the tank* cannot be true if the speaker was merely present but doing something totally unrelated to the tank. However, if there is some specific possibility or expectation of preventing a change, that participant could conceivably be said to have caused the change by failing to stop it.

   With this in mind, if result verbs encode causation but not actorhood per se, then they should in principle be compatible with *didn't move a muscle* in a negligence context, even if other prerequisites for actorhood (e.g., animate, human) are met. This is possible, as shown in the context in (36) with *destroy*, where the owner of a car can be said to have destroyed the car through (deliberate or nondeliberate) negligence, a type of *non*action.[14]

   (36) Jim destroyed his car, but didn't move a muscle—rather, after he bought it he just let
        it sit on his neighbor's lawn on cinder blocks, untouched, until it disintegrated!

Thus, at least some result verbs do not seem to actually encode actorhood.

   However, as a reviewer points out, some supposed result verbs seem to resist this frame, including in particular *break*. For example, (37) seems at first to be a contradiction.

   (37) #Kim broke my DVD player, but didn't move a muscle.

Nevertheless, although animate causers are *typically* actors in breaking events, this is not always the case, and even here negligence is possible. This is illustrated by placing (37) in the negligence context in (38), which seems to mitigate the apparent contradiction.

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[13] This in turn corresponds to what Wolff and Song (2003:44–45) call FAIL TO PREVENT and Wolff (2007:88) calls ENABLE. Most particularly, in a recent experimental study Wolff, Barbey, and Hausknecht (2010) outline and motivate the general linguistic relevance of various types of ''causation by omission,'' including cases where something prevents itself from preventing something (pp. 205–210), although their particular scenarios involve an active attempt at preventing that is suddenly stopped short, rather than wholesale failing to act at all.

[14] However, this reading of *destroy* relies on the expectation that the causer would or should have acted to stop the change, but failed to. One could instead say that result verbs *do* encode an (unspecified) action, but unlike with manner verbs, the action need not obtain in the real world (e.g., it is embedded under a sublexical modality as proposed by Koenig and Davis (2001) or is a ''virtual force'' as proposed by Wolff, Barbey, and Hausknecht (2010:206)). In this case, there is still a distinction between manner and result verbs: the former require action in the real world, the latter do not.

(38) Kim broke my DVD player, but didn't move a muscle—rather, when I let her borrow it a disc was spinning in it, and she just let it run until the rotor gave out!

Thus, at least some canonical result verbs allow readings where the causer is not an actor. The reason (37) seems infelicitous is that, absent an appropriate negligence context, the default reading for result verbs with human subjects is that an action was performed. But this is not part of the verb's meaning; instead, it is derived pragmatically, in line with the pragmatic principle recognized by Holisky (1987:118–119) for interpreting human causers as agents in the absence of contrary evidence (see also Van Valin and Wilkins 1996).[15]

Manner-of-killing verbs pattern with manner verbs in that it is contradictory to assert with one of these verbs that the causer killed the patient and to deny that any action was performed, even in the sorts of contexts, like those above, where causation is entailed but actorhood is not. This is illustrated by (39), where, to our ears, one cannot be accused of crucifying, electrocuting, drowning, or hanging someone simply by negligently failing to prevent it, in contrast with the pure result verbs in (36) and (38).

(39) a. #The governor crucified/electrocuted the prisoner, but didn't move a muscle—rather, after taking office she failed to issue a pardon!
     b. #The governor drowned/hanged the prisoner, but didn't move a muscle—rather, during the execution she just sat there, tacitly refusing to order a halt!

This is not to say that the governor in (39) could not be held responsible for the prisoner's death, but it is not possible to express this with a manner-of-killing verb. Thus, these verbs entail that their causers have actor-oriented manner, and they are therefore manner-encoding.

4.3 Manner Diagnostic #3: Complexity of Action

A third diagnostic relates to the complexity of the action named by the verb. RH&L (p. 32) suggest that ''the vast majority'' of manners are *complex*, consisting of a series of separate changes. Dowty (1979:170–171) further notes that complex manner verbs like *waltz* require nontrivial time intervals to evaluate (i.e., more than two moments; waltzing requires at least three steps). Thus, complex manner verbs should be durative, and this can serve as a diagnostic. A standard durativity test is *take/spend an hour* (Kearns 2000:206). *Take an hour* has an 'after an hour' reading when it embeds a punctual, telic predicate, as in (40a), but either an 'after an hour' or a 'during an hour' reading with durative telic predicates, as in (40b).[16] Durative atelic predicates take *spend an hour*, which has only a 'during' reading, as in (40c).

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[15] A reviewer notes that subject choice may have an effect as well, giving #*The army destroyed the city, but didn't move a muscle* in contrast to (36), where necessary actorhood may be a contingent fact about armies destroying cities. However, given that negligence is possible with other uses of *destroy*, *destroy* does not itself require actorhood. Conversely, no context will change the outcome of this diagnostic with pure actor-oriented manner verbs; in these cases, it must be the verb itself that determines the behavior in this diagnostic.

[16] *Take an hour* is more acceptable with telic predicates while *spend an hour* is more acceptable with atelic predicates, though *spend an hour* is somewhat more acceptable with telic predicates than *take an hour* is with atelic predicates. Punctual predicates are always telic since, being instantaneous, they encode an endpoint.

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

The correlation of complex/simplex manners to durativity/punctuality is illustrated in (41a–b) for uncontroversial manner verbs indicating simplex and complex actions, respectively.

(41) a. It took John five minutes to blink (once).　　　　('after five minutes'; punctual)
　　b. John spent five minutes running.　　　　　　　　('during five minutes'; durative)

Thus, we should be able to probe for complex manners by looking at durativity.

　　However, as Beavers (2008) has shown, durativity is also contingent on the nature of the result: changes along multipoint scales result in durative predicates, and changes along two-point scales result in punctual predicates. These two possibilities are illustrated in (42a–b) for uncontroversial result verbs encoding simplex and complex change, respectively.

(42) a. It took Jim five minutes to break the window.　　　('after five minutes'; punctual)
　　b. It took Jim five minutes to clean the table.　('after/during five minutes'; durative)

So, what if a verb encodes both manner *and* result? The effects of one on durativity would mask the effects of the other. A punctual predicate could encode either just a simplex manner or just a two-point change, or both, but nothing about its punctuality indicates which. A durative predicate allows more possibilities: it may encode either a complex manner (where the change can be simplex, complex, or nonexistent) or a complex change (where the manner can be simplex, complex, or nonexistent). But durativity does not tell us which it is.

　　However, if we know independently that the change for some verb is simplex, so that the scale has only two points, then if the predicate is durative, it must be because there is a complex manner. In fact, manner-of-killing verbs do encode a two-point change: not dead to dead (see section 3.4). Thus, by virtue of the change, they *should* be punctual. If they are not, then it *must* be because of a manner component. In fact, many manner-of-killing verbs are durative, as in (43), where *take an hour* allows both an 'after' and a 'during' reading.

(43) It took me five minutes to drown/hang/crucify Jim . . . ('during/after five minutes')
　　　AFTER: because I lacked the courage.
　　　DURING: because this is how long it takes to kill someone by holding them under water/cutting off their air/nailing them down, hoisting them up, and waiting.

Thus, again (at least some) manner-of-killing verbs have a manner component.[17]

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[17] A few manner-of-killing verbs are punctual, as in (i), which could involve a beheading via one quick slice.

(i) It took me five minutes to guillotine Jim (with one slice).　　　　　　　　　　('after five minutes')

However, this does not show that *guillotine* lacks manner; it only shows that its manner is not complex.

4.4 Manner Diagnostic Summary

In this section, we have taken RH&L's definition of manner as nonscalar change and developed truth-conditional diagnostics that test for it, independent of any result in a verb's meaning. On the basis of these tests, we have shown that manner-of-killing verbs encode a manner. However, we showed in section 3 that these verbs also pass result diagnostics. Thus, manner-of-killing verbs encode both manner and result, therefore counterexemplifying manner/result complementarity as a truth-conditional claim about possible verb meanings.

However, as noted in section 2, some alternatives present themselves. It could be that each verb only encodes a manner or a result, and whichever is not encoded arises through some conventional inference based on the specific encoded meaning, as per Levin and Rappaport Hovav 2008. However, if this were so, the additional inference should be defeasible; yet in the above tests, it was not possible to just cancel out either meaning component. Conversely, as both a reviewer and Beth Levin (pers. comm.) have pointed out, it could be that each verb is polysemous between a pure manner and a pure result reading. On this analysis, the reason these verbs pass all tests for both manner and result is that the result use passes the result tests and the manner use passes the manner tests. Thus, (44a) is infelicitous because this variant of *guillotine* is the result one, while (44b) is infelicitous because this variant of *guillotine* is the manner one, with neither variant encoding both meanings at the same time.

(44) a. #The peasants guillotined the queen, but nothing is different about her.
    b. #The heavy wind guillotined the queen (by releasing the blade).

However, if *guillotine* were polysemous in this way, it would actually predict the *opposite* pattern. For example, in a neutral context such as we have tended to use above, (44a) should admit a *felicitous* reading with *guillotine* interpreted as a manner verb, while (44b) should admit a *felicitous* reading with *guillotine* interpreted as a result verb. In other words, if these verbs were polysemous, they should *fail* all of the tests, rather than pass them. That this is not so suggests they are not polysemous, but instead encode both meanings at once.

It could also be that these verbs do indeed encode both a manner and a result, but that this manner and result are different somehow from the notions found in pure manner and result verbs, respectively, and thus are not subject to complementarity. However, the diagnostics we adopted were rooted in canonical manner and result verbs, and thus it seems clear that the relevant components that give rise to these behaviors are the same. Thus, these verbs really do encode exactly the type of content found in both pure manner and pure result verbs, counterexemplifying manner/result complementarity as a truth-conditional fact of verb meaning. Before we explore how this fact fits into a theory of event structure, though, we briefly consider two additional verb classes that we also show are truth-conditionally manner+result verbs.

5 Other Classes of Manner+Result Verbs

In this section, we briefly argue that there are verbs in other domains that also pass our diagnostics, suggesting that manner+result verbs are attested beyond Levin's (1993) *poison* verbs. We discuss two such classes here: ballistic motion and manner-of-cooking verbs.

5.1 Ditransitive Ballistic Motion Verbs

Rappaport Hovav and Levin (2008) argue that there are two broad classes of ditransitives: *give*-type verbs (e.g., *give*, *hand*), which entail caused possession but not change of location; and all others, which do entail change of location. Their *throw*-type verbs (the ballistic motion verbs of Gropen et al. 1989:243–244) are in the latter class.

(45) Throw *verbs*
     fling, flip, kick, lob, shoot, slap, throw, toss

This class is of interest since change of location is a result as defined in section 2: it is a change along a spatial scale of points along a path (see Beavers 2011a for extensive discussion). However, such verbs also encode manner. We show this for *flip*, *throw*, and *toss*.

    The fact that these verbs encode a change of location is relatively uncontroversial. Indeed, Rappaport Hovav and Levin (2008:135) themselves observe exactly this, noting that ''*throw*-type verbs entail change of location. . . . Something cannot be *thrown* . . . without changing its location.'' Unfortunately, because the restricted result XP and object deletion result diagnostics of sections 3.2–3.3 both work only for monotransitive verbs, we cannot apply them to *throw*-type ditransitives.[18] But the contradiction diagnostic of section 3.1 does work, and it shows that a result is indeed entailed (the relevant entailment covering all of these verbs—and others of change of location—is *x is somewhere else*, as mentioned in section 3.1).

(46) a. #Mary just flipped John the empty can, but it is not somewhere else.
     b. #Mary just tossed John the ball, but it is not somewhere else.
     c. #Mary just threw John the ball, but it is not somewhere else.

This supports the claim that these verbs entail a result, namely, a change of location (in particular, leaving physical possession by the subject; see Beavers 2011a).

    If these verbs all entail change of location, how do they differ from one another? Rappaport Hovav and Levin (2008:135) themselves propose that what distinguishes them is in fact manner:

> [*T*]*hrow*-type verbs entail change of location but not change of possession. . . . What distinguishes among such verbs is how the force is imparted; they have a manner root (e.g. *lob*, *throw*) or, perhaps, an instrument root (e.g. *kick*, *shoot*).

Unfortunately, the complexity diagnostic will not work since, as Beavers (2011a) shows, nearly all of these verbs encode two-point changes and simplex manners and thus are punctual. However,

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[18] A reviewer suggests that we could look at the monotransitive variants for these diagnostics. We are hesitant to do this, as we do not necessarily want to commit to saying that the monotransitive and ditransitive variants have the same root. However, it would be very surprising if they did not, and thus it is worth noting that monotransitive variants fail to permit object deletion (e.g., #*All last night, Kim flipped/threw/tossed*, on the intended readings), do not permit result XPs not directly related to motion (e.g., #*Kim flipped/threw/tossed the ball to pieces*), and do not permit nonsubcategorized object resultatives (e.g., **Kim flipped/threw/tossed his arm sore*), all consistent with their encoding a result, as we claim to be the case for their ditransitive variants.

throw-type verbs do seem contradictory with *didn't move a muscle*, even in a context where the subject could plausibly be said to be a negligent causer, as in (47).

(47) [A tennis coach sets up a ball machine that sends balls to the students, and puts Isaac in charge of the machine, telling him to stop it at 4:00 p.m.]
    ??Isaac flipped/threw/tossed the kids the balls after 4:00 p.m., but didn't move a muscle—rather, he failed to stop the ball machine at the specified time.

Rather, to say that one *flipped*, *threw*, or *tossed someone a ball* requires some manipulation of the ball. Furthermore, *throw*-type verbs show subject selectional restrictions, dispreferring inanimates (except perhaps on an instrumental subject reading) and natural forces.[19]

(48) a. John flipped/threw/tossed Sandy the ball with his new glove.
    b. #The new glove flipped/threw/tossed Sandy the ball.
    c. #The wind flipped/threw/tossed Sandy the ball.

Thus, *throw*-type verbs encode both a result and an (actor-oriented) manner, consistent with Rappaport Hovav and Levin's (2008) claims; consequently, they are manner+result verbs.

5.2 Manner-of-Cooking Verbs

Certain verbs in Levin's (1993:243) *cooking* class in (49) also encode both manner and result. Many of these verbs describe manners of bringing about the result that a particular foodstuff goes from raw to cooked (in some fashion or to some degree).

(49) Cooking *verbs*
    barbecue, blanch, braise, broil, deep-fry, fry, grill, hardboil, microwave, poach, roast, sauté, stew, toast, etc.

We focus on *braise*, *poach*, and *sauté*. First, we consider result diagnostics. As (50a–c) show, for these verbs, denying that the object changed yields a contradiction.

(50) a. #Shane just braised the chicken, but nothing is different about it.
    b. #Shane just poached the egg, but nothing is different about it.
    c. #Shane just sautéed the onions, but nothing is different about them.

Second, these verbs disallow object deletion, as shown in (51).

(51) a. *All last night, Shane braised.
    b. *All last night, Shane poached.
    c. ??All last night, Shane sautéed.

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[19] Some machines, such as pitching machines, are possible, consistent with the widespread observation that machines can behave like actors (see, e.g., Cruse 1973:16). As noted in section 4.1 more broadly, judgments here may vary widely depending on how one conceptualizes the relevant subjects.

Furthermore, these verbs disallow result XP-modification where the result XP is not a further specification of the result encoded by the verb, here a state of being cooked to some degree, as in (52).

(52) a. #Shane braised the duck to the back of the oven.
         (e.g., if the temperature was so hot it somehow caused the pan to move)
     b. #Shane poached the egg in half.
     c. #Shane sautéed the onions straight.

A reviewer finds some such examples possible, giving *Ming stewed the beef tendon stiff/soft/to pieces/black* and *You can poach these vegetables green, even though they are pale yellow when raw* (we judge the latter unacceptable and the former unacceptable with *black*). However, as noted in section 3.3, some result verbs may allow result XPs that are more loosely connected to the verbal result (here being cooked to some degree, though this may encompass textures and colors). What matters most is that the possible result XPs are somewhat constrained. Finally, result XPs predicated of nonsubcategorized objects are unacceptable.

(53) a. *Shane braised the pan dry.   (e.g., while braising duck)
     b. *Shane poached the water bacteria-free.   (e.g., while poaching an egg)
     c. *Shane sautéed the seasoning off the pan.   (e.g., while sautéing onions)[20]

Thus, these verbs clearly encode a result, which seems correct given their intuitive meaning.

Turning to manner, the durativity diagnostic is unfortunately hard to apply. As discussed above, this diagnostic relies on the verb encoding a nongradable scalar change, and indeed Levin (2008:15) suggests that this is true for at least *poach* and *sauté*.

(54) a. #This egg is more poached than that one.
     b. #These vegetables are more sautéed than those.

However, we find these data relatively acceptable. Furthermore, although *more* may be unacceptable or less common with these adjectives, it is not difficult to find examples for *lightly* and *slightly*, which also convey multiple degrees, and such a modifier is generally not acceptable with nongradable adjectives (e.g., #*(s)lightly dead/pregnant*).

(55) a. Eating lightly sauteed cabbage and raw granola cereal at 1am. Am I pregnant or
        what? LOL
        (www.twitter.com/KristensRaw/status/7361004218)
     b. Chard can also be lightly braised in stock or warm water.
        (www.wisegeek.com/what-are-some-different-ways-to-cook-chard.htm)

Thus, these verbs seem to encode gradable scales and are therefore expected to be durative (e.g., *It took him ten minutes to sauté/poach the ham* allows a durative reading), obscuring any effect

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[20] A reviewer finds this sentence acceptable. We disagree and note in (weak) support of our judgments the fact that a Google search returns no hits for either *sautéed the seasoning off* or *sautéed the Teflon off* (by contrast with *burned the seasoning off* and *burned the Teflon off*, for which examples indeed exist).

of manner.[21] Nonetheless, our other manner tests suggest that these verbs do encode a manner, since the infelicity of (56a–c) shows that it cannot simultaneously be asserted that someone is cooking and denied that this person is moving.

(56) a. #Shane braised the chicken, but didn't move a muscle.
      b. #Shane poached the egg, but didn't move a muscle.
      c. #Shane sautéed the onions, but didn't move a muscle.

These examples are not saved by a negligence context like the one in (57).

(57) [A salmon fillet is in a pan waiting to be poached, and John is in charge of making sure nothing happens to it until dinnertime. Mary turns up the heat in the apartment so high the water in the pan starts to simmer anyway, cooking the salmon.]
      #John poached the salmon, but didn't move a muscle—rather, he just sat there while the heat simmered the water.

To say one has *poached* something requires some direct interaction with the patient (and we believe the same to be true for *braise* and *sauté*). Likewise, these verbs seem to impose some subject selectional restrictions barring inanimates (except perhaps instruments) and natural forces. Here, we look at *braise* and *sauté* for brevity (though again judgments may vary).

(58) a. Shane braised/sautéed the duck in a new Le Creuset pan.
      b. ??Shane's Le Creuset pan braised/sautéed the duck perfectly.
      c. ??The heatwave/even heat braised/sautéed the duck to perfection.

Thus, these verbs are manner-encoding as well as result-encoding.

6 Manner, Result, and the Architecture of Event Structure

In the preceding sections, we developed diagnostics for manner and result in a verb's meaning rooted primarily in their truth-conditional content, and we argued that there are verbs that have both meaning components, counterexemplifying manner/result complementarity as a truth-conditional fact about verb meanings. We now consider the theoretical consequences of this, arguing that complementarity may nonetheless hold as a condition on possible event structures, albeit in ways that allow truth-conditional manner+result verbs.

6.1 Complementarity in Event Structures

RH&L's explanation for the manner/result complementarity claim relies on properties of event structures. Recall that we take a monomorphemic verbal lexeme to consist at least minimally of

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[21] Levin (2008) uses the observation that *sauté* encodes nongradable change as evidence against its encoding a result. As discussed in sections 3.4 and 4.3, however, scalar changes, and hence results, can be nongradable; this is the case for any achievement verb. Therefore, it is unwarranted to conclude that *sauté* does not encode a result on the basis of the inability of an adjective derived from it to take a gradable modifier. Rather, the more refined result diagnostics that we laid out above show that it does encode a result.

a pairing of a monomorphemic morphological root and a single event structure built of basic event-denoting predicates such as CAUSE, BECOME, and ACT, and a lexical semantic root that fills in the real-world details of some aspect of the event structure. The event structure in turn partly determines the truth-conditional meaning of the verbal lexeme in terms of the sorts of events it describes, as proposed in Dowty 1979. We begin by reconsidering certain aspects of RH&L's (p. 25) Lexicalization Constraint, stated in (59), from which manner/result complementarity is meant to follow as a theorem.

(59) *Lexicalization Constraint*
    ''A root can only be associated with one primitive predicate in an event schema, as either an argument or a modifier.''

Thus, in any event structure the root either modifies an ACT predicate as in (60a), giving rise to a manner verb, or is an argument of a basic BECOME predicate as in (60b), giving rise to a result verb. But a single root has one and only one function, ruling out (60c).[22]

(60) a. [x ACT$_{\langle ROOT \rangle}$]
    b. [[x ACT] CAUSE [y BECOME $\langle ROOT \rangle$]]
    c. *[[x ACT$_{\langle ROOT \rangle}$] CAUSE [y BECOME $\langle ROOT \rangle$]]

However, there is a further (implicit) assumption: a single monomorphemic lexeme cannot have two distinct roots in its event structure, so that (61) is ruled out for a single verb.

(61) *[[x ACT$_{\langle ROOT_1 \rangle}$] CAUSE [y BECOME $\langle ROOT_2 \rangle$]]   (in a single verb)

This event structure is not ruled out a priori, as (per Rappaport Hovav and Levin 1998:119) it is found with complex resultative constructions (and perhaps also other complex predicates that Snyder (2001) and Beck and Snyder (2001) assimilate to the same interpretive principle as resultatives). But RH&L seem to assume that such an event structure cannot be associated with a single monomorphemic lexeme; otherwise, it should be possible to have in essence a ''lexical resultative,'' and this would, by definition, be manner+result-encoding.

Thus, manner/result complementarity—as a truth-conditional claim—follows on RH&L's theory from two theoretical assumptions about event structures:

  i. There is only ever one root per lexeme.
  ii. A root meaning can contribute either manner or result, but not both.

We have shown, however, that complementarity does not hold truth-conditionally. Thus, if (i) and (ii) do indeed derive it, at least one of them must be wrong. We argue that (i) is correct and

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[22] We represent the cause in (60b) as an eventuality on the part of the causer *x*, although Rappaport Hovav and Levin (1998:107–109) equivocate on whether causation in lexical causatives is a relationship between a caused event and a causing event (as with resultatives) or just an individual (e.g., [x CAUSE [y BECOME $\langle ROOT \rangle$]]). For consistency, we adopt (60b), but we assume that the causing eventuality, if there is no manner modifier, is extremely unspecified and may not require any action in the strict sense as noted for *destroy* in section 4.2 (e.g., if it is a causing state as per Beavers and Zubair, to appear; see also Van Valin and Wilkins 1996 and Koontz-Garboden 2009 on so-called effector subjects).

(ii) incorrect. To demonstrate this, it is important to realize that (i) and (ii) are not assumptions of the same order. Crucially, (ii) is a claim about how much and what types of truth-conditional content can be encoded in a single root (and by extension, a single lexeme). Therefore, it can be falsified by looking at truth-conditional diagnostics, as we have done (provided we know that we are dealing with a single root in any given predicate—that is, that (i) holds). Assumption (i), however, is not a truth-conditional claim about verb meaning; rather, it is a claim about how event structures are (de)composed—namely, that all of the idiosyncratic meaning in a lexeme is packaged together into one single unit. Therefore, the diagnostics needed to validate it may differ from those needed for (ii).

To identify diagnostics appropriate for (i), we look to perhaps the key property of event-structural approaches to verb meaning: the assumption that word meanings contain *linguistically significant hierarchical structure*, indicated in RH&L's representations by bracketing. Standard data motivating a decompositional analysis of caused change-of-state predicates are the ambiguities of scopal adverbs such as *again* as in (62), which generate two readings: restitutive (restoring a prior state) and repetitive (performing an action again that had led to an instance of the given state obtaining) (see Dowty 1979:chap. 5).

(62) a. John opened the door again.
     b. John flattened the metal again.

Example (62a) means either that John caused the door to be open and it had been open before, or that John caused it to open and this had happened before. Example (62b) is similar. The event-structural explanation for this lies in the structure of event structures themselves. A larger event of caused change embeds a result root, and *again* may take scope over either the result root or the larger event. The details of how *again* interacts with the event structure to predict this differ from theory to theory. In theories that take event structures to represent syntactic constituents (e.g., von Stechow 1995, 1996, 2003, Marantz 1997, Embick 2004, Folli and Harley 2004, Ramchand 2008), the scope difference boils down to an attachment ambiguity, where the possible attachment points are constituents; thus, to capture the restitutive/repetitive contrast, the event structure must be defined so as to provide constituents that give rise to the appropriate readings. In lexical theories of event structure (Dowty 1979:chap. 5), some additional machinery (e.g., meaning postulates) is needed to ensure that when *again* modifies a predicate headed by a verb associated with the appropriate event structure, the interpretation is such that it takes scope semantically over only the result root or some larger event, though again this builds on the hierarchical structure and in principle any bracketed element can be targeted by *again*. However, in either theory some additional constraints may apply to rule out some readings (and we note one such constraint below).[23]

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[23] A separate question is how many repetitive readings there are—or rather, how many larger constituents include the result root that can be targets of *again*. For our argument, it is only relevant whether the reading is restitutive or repetitive in general, so we assume for expository purposes just one repetitive attachment point.

We remain agnostic between these two types of approaches, and we focus only on what readings arise from *again* modification, assuming these two possible attachment points, though for illustrative purposes we continue to use lexicalized event structure representations. Following Dowty (1979:265, (49)), restitutive scope relies on deriving an event structure like the one in (63a) for (62a), and a repetitive reading relies on (63b).

(63) a. [[x ACT] CAUSE [y BECOME ⟨again(open)⟩]]
     b. again([[x ACT] CAUSE [y BECOME ⟨open⟩]])

It will be important below to give a more explicit analysis of restitutive readings. Regardless of whether a result root is an object in a separate lexicalized event-structural representation or a morphosyntactic object in a syntactically realized one, the analysis is the same, namely, that the root is or has a denotation of type $\langle e, \langle h, t \rangle \rangle$ (where e is the type of individuals, h the type of events, and t the type of truth values), as in (64a) for *open*. Restitutive *again* has a denotation that takes a stative predicate as input and outputs a stative predicate which asserts that the input state holds and held before, as in (64b) (adopting a simplified version of von Stechow's (1996: 95) analysis; see also Beck and Johnson 2004:107, (21)). Composing (64b) with (64a) produces (64c) of an open state for some individual x where there had been a prior open state for x (for events e, e', $e' \ll e$ means e' temporally precedes e).

(64) a. $\llbracket \text{open} \rrbracket = \lambda x \lambda e_1 [open'(x, e_1)]$
     b. $\llbracket \text{again} \rrbracket = \lambda P \lambda x \lambda e_1 [P(x, e_1) \wedge \exists e'_1 [e'_1 \ll e_1 \wedge P(x, e'_1)]]$
     c. $\llbracket \text{again} \rrbracket (\llbracket \text{open} \rrbracket) = \lambda x \lambda e_1 [open'(x, e_1) \wedge \exists e'_1 [e'_1 \ll e_1 \wedge open'(x, e'_1)]]$

Embedding (64c) under BECOME as in (63a) generates the restitutive reading that the patient opened and had been open before. We leave aside the exact analysis of repetitive readings, since it turns out to be irrelevant for our ultimate claims. What matters is that there are two attested scope positions for *again*—over only the result or strictly more than the result—which follows in large part from the hierarchical nature of the event structure.

Likewise, given the semantic opacity of roots assumed by all theories of event structure, another consequence of this analysis is that roots are scopal units with regard to *again*, no matter how complex the meaning of the root itself. For example, in *John cleared the table* the result state is complex, involving a series of conditions such that every part of the table is clear. Yet in restitutive *John cleared the table again*, *again* must take scope over the entire result, so that once again the entire table has nothing on it. It cannot take scope over just a subset of the lexical entailments—for example, that again only half of the table has nothing on it.

Thus, the key ingredients of decompositions are that (a) they are composed of basic decompositional operators and lexical semantic roots from which (b) they are built up hierarchically. The scope facts with *again* provide evidence for this structure. Assuming that the template for manner+result verbs is caused change of state, to evaluate whether it is assumption (i) or assumption (ii) above that must be eliminated, we look at these verbs' behavior with scopal modifiers. If manner and result are packaged together in a single root (i.e., assumption (ii) is invalid), then scopal modifiers should never take scope over one to the exclusion of the other (e.g., restitutive

readings should be impossible). If they are encoded in separate roots (i.e., assumption (i) is invalid), then in principle this *should* be possible.

6.2 The Decomposition of Manner+Result Predicates

We consider first the behavior of manner+result predicates that clearly have two morphological roots. The key exemplars are resultative constructions, which crucially have two overt lexemes indicating manner and result, respectively. As Beck and Snyder (2001:56–57) and Beck and Johnson (2004:108–110) discuss in detail, in such cases, *again* can semantically take scope over just the result to the exclusion of the manner, as illustrated in (65).[24]

(65) a. Mary made a sheet of metal that is flat, but it later accidentally became bent. Fortunately, John hammered the metal flat again.
  b. Mary bought a new front door for her house, and installed it in an open position. Later, the wind blew it closed, so John kicked it open again.
  c. Mary, a natural redhead since birth, decided to dye her hair bright green. However, after seeing herself in the mirror she was mortified, so she went to her hairdresser and he dyed it red again.

In each case, the reading is restitutive: in (65a), the metal need never have been hammered before, or even flattened, suggesting the event structure in (66), and similarly for (65b–c).

(66) [[x ACT$_{\langle hammering \rangle}$] CAUSE [y BECOME $\langle$again(flat)$\rangle$]]

This is as predicted if the manner and result are determined by separate roots, with *again* taking scope over just the result. The question is whether this analysis extends to monomorphemic manner+result verbs, wherein for example *drown* is a ''lexical resultative'' with a structure like the one in (67), albeit violating assumption (i), though consistent with (ii).

(67) [[x ACT$_{\langle drowning \rangle}$] CAUSE [y BECOME $\langle$dead$\rangle$]]

If so, *again* should be able to take scope solely over the result, as with resultatives.

However, *again* necessarily takes scope over *both* meaning components. To demonstrate this for a verb entailing death, we must appeal again to the somewhat unusual context of zombies, which can be killed more than once. Consider an example where a zombie has died and been reanimated, and John drowns him. Crucially, (68) can only mean that the zombie was drowned some previous time when he died. It cannot mean that he had been killed some other way and is now dying again, this time by drowning.

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[24] We leave open how resultatives are formed, but assume (with Dowty (1979:308–309) and Rappaport Hovav and Levin (1998:119)) that the rule makes reference to (and augments) the event structure of the verb.

(68) John drowned the zombie again.
     MEANS 'John caused the zombie to be dead by drowning again.'
     CANNOT MEAN 'John caused the zombie to become dead again by drowning, but
     the last time he was killed it was with a chainsaw.'

Thus, *again* takes scope over both the manner and the result, and it cannot take scope over just
the result as with true resultatives, as in (65). Other manner-of-killing verbs behave the same
way with *again*.

(69) a. The sheriff hanged the zombie outlaw again.
     b. The Romans crucified the zombie leader again.
     c. The governor electrocuted the zombie prisoner again.
     d. Dr. Frankenstein guillotined the zombie again.

If manner-of-killing verbs are lexical resultatives, this is unexpected.

However, it might be possible to maintain the lexical resultative analysis, but to posit that
these verbs idiosyncratically disallow restitutive attachment of *again*, leaving only repetitive
attachment and thus only a repetitive reading. That certain attachments might be ruled out for
some uses of *again* is not unheard of. Von Stechow (1995, 1996, 2003) has argued that German
wieder 'again' shows different scopal readings with transitive change-of-state verbs depending
on its syntactic position; something similar can be seen with presentential *again* in English as in
Again, John hammered the metal flat, which requires a repetitive reading (see also Beck and
Johnson 2004:112 on preverbal *again*). So it is possible that manner-of-killing verbs require *again*
to be in a ''repetitive only'' syntactic position.

However, this analysis is not unproblematic. First, it is stipulative: why would manner-of-
killing verbs but not resultatives require this if they have the same event structures? Second,
again in (68) and (69) is postsentential, a position in English that otherwise never requires a
repetitive reading. We could get around this by saying that the repetitive reading is required not
by forcing *again* into a ''repetitive only'' syntactic position, but by disallowing restitutive attach-
ment from any position. However, this is harder to motivate for another scopal morpheme, namely,
re- as in (70), which also has repetitive and restitutive readings.

(70) John reopened the door, and it had been open/opened before.

Dowty (1979:256), Wechsler (1989), and Marantz (2007, 2009) have argued that *re-*, unlike *again*,
is not structurally ambiguous with regard to the event structure of the verb, since *re-* never admits
a *necessarily* repetitive reading. This follows if *re-* always has restitutive attachment, and thus a
restitutive reading is always possible. Since the repetitive reading entails the restitutive reading,
the former can be derived pragmatically from the latter in contexts where it also happens to be
that the entire action had occurred before. This is unlike *again*, which (sometimes) *only* has a
repetitive reading, requiring a genuine ambiguity.

Crucially, if *re-* always takes low scope and manner-of-killing verbs are lexical resultatives,
re- should either show a purely restitutive reading or be ruled out with these verbs since they

seem to force high attachment of scopal modifiers. However, attaching *re-* to *guillotine* in the zombie-type context produces exactly the same reading as *again* in (68) (we thank Alec Marantz for pointing this fact and its significance out to us).

(71) John reguillotined the zombie.
MEANS 'John caused the zombie to be dead by guillotining again.'
CANNOT MEAN 'John caused the zombie to become dead again by guillotining, but the last time he was killed it was with a chainsaw.'

This is surprising if *re-* only allows restitutive attachment. One could say that *re-* does allow repetitive attachment, and that manner+result verbs categorically require this attachment for the same reason they require it of *again*. However, this still requires some additional mechanism to rule out a restitutive reading, which is otherwise attested with resultatives. We turn next to an alternative analysis that instead maintains assumption (i) but rejects (ii), and we show that it captures all of the above data directly without any additional mechanisms.

6.3 Manner+Result Roots as ''Result'' Roots

An alternative would be that manner-of-killing verbs allow restitutive attachment (thus accommodating the standard assumptions about *re-*), but restitutive attachment gives rise to a repetitive reading. How could this be? A straightforward explanation is that these ''result'' roots also encode manner (rejecting assumption (ii) above, but maintaining (i)). One might object that this requires a ''result'' root to impose constraints on the verb's subject, despite Kratzer's (1996) claim that external arguments are introduced by distinct functional heads. However, nothing a priori rules out a result root from encoding not just a result, but also that (a) the result has a cause and (b) the cause is of a certain type (see Wechsler 2005b for a general critique of Kratzer's proposal along these lines).

Thus, a possible denotation for the root of *guillotine* on this analysis could be (72), where it predicates a result *dead'* of its single individual argument, but also says that it must have a cause, and further that any such cause is of a certain type, namely, a guillotining.

(72) $[\![$guillotine$]\!]$ =
$\lambda x \lambda e_1[dead'(x, e_1) \wedge \exists e_2[cause'(e_2, e_1)] \wedge \forall e_3[cause'(e_3, e_1) \rightarrow guillotining'(e_3)]]$

Although this ''result'' root does not predicate directly of the actual causing event of e_1 introduced by the CAUSE predicate, it does impose a constraint that any event that caused e_1 must have been a guillotining, thus ensuring that whatever *specific* event caused e_1 must have been a guillotining, in essence indirectly constraining the actual manner of causation.[25] Crucially, if (72) were the mean-

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[25] Note that it is not sufficient for the root to say of e_2 that it be a guillotining, since there is no assurance that the actual causing event introduced by the predicate denoting causation will be equated with e_2.

ing of the *guillotine* root, applying *again* as defined in (64b) would generate the meaning that there is a state of death that is necessarily caused and the causing event is a guillotining, by virtue of the fact that anything that caused this state is a guillotining, and furthermore there had been a prior state satisfying all the same conditions, so that it was also a state of death, it had a cause, and that cause was a guillotining.

(73) $\llbracket$again$\rrbracket(\llbracket$guillotine$\rrbracket) = \lambda x \lambda e_1[[dead'(x, e_1) \wedge \exists e_2[cause'(e_2, e_1)] \wedge$
$\forall e_3[cause'(e_3, e_1) \rightarrow guillotining'(e_3)]] \wedge \exists e'_1[e'_1 \ll e_1 \wedge [dead'(x, e'_1) \wedge$
$\exists e'_2[cause'(e'_2, e'_1)] \wedge \forall e'_3[cause'(e'_3, e'_1) \rightarrow guillotining'(e'_3)]]]]$

Thus, while (72) does not directly predicate of the causing event, its meaning restricts what that event can be.[26] Our analysis also allows us to maintain that *again* and *re-* show restitutive attachment with manner-of-killing verbs, as expected if they have caused change-of-state event structures. Thus, unlike in the analysis in section 6.2 that maintained assumption (ii) but eliminated (i), no additional mechanisms are needed to rule any readings out; restitutive readings do not arise because restitutive attachment generates a repetitive reading owing to the idiosyncratic meaning of the root.

Our analysis also predicts that *again* cannot take scope over the manner in a manner-of-killing verb to the exclusion of the result. This again follows from the fact that the manner is packaged with the result in the root, which acts as a scopal unit. However, a reviewer wonders why, given our assumption that there is always a causing eventuality even for lexical causatives (i.e., an ACT event in (60b)), *again* cannot take scope exclusively over this very generic causing eventuality, and thereby generate a kind of repetitive reading but without the result (something not possible for any position of *again*: for example, *(Again) John (again) guillotined the zombie (again)*). If *again* can target any bracketed structure in an event structure, this should be possible. However, taking scope over just the causing eventuality to the exclusion of the result seems to be generally impossible even for resultatives: *(Again) John (again) hammered the metal flat (again)* also lacks this reading. This suggests that there is some general constraint on event structures ruling out scope over just the causing eventuality. Whatever this constraint is, it carries

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[26] An analysis of this sort is not unheard of. Marantz (2009) makes an analogous argument for an apparently repetitive *re-* reading with *read*.

(i) The man reread the book.

The default reading is that the same man read the book before, as though *re-* takes scope over the subject. However, Marantz suggests that this arises because the *read* root encodes a separate, unexpressed ''reader'' participant that is (almost always) interpreted coreferentially with the subject. This gives the appearance that *the man* is in the scope of *re-*, when it technically is not. This is similar to our analysis for manner-of-killing roots, where the relevant entity is the causing event. Our analysis is thus also compatible with a severed external argument analysis, either a traditional one in which causation and the causer's thematic role are introduced via one syntactic head as in Kratzer 1996, or one in which they are introduced separately as in Pylkkänen 2008.

over directly to manner-of-killing verbs, but is also more general than and thus orthogonal to our concern about the roots of these verbs.[27]

But is there any independent motivation for assuming a class of manner+result roots? In fact, there is. As suggested by Rappaport Hovav and Levin (1998) and as Koontz-Garboden (2005, 2010) shows (building on Dixon 1982), roots that denote states come in two varieties: what Dixon refers to as basic ''property concept'' roots that denote simple states like colors, intrinsic physical properties, and qualities, and what we call ''caused-result'' roots that denote states that necessarily arise because of a prior event of change, which underlie certain classes of change-of-state verbs such as *melt*, *rip*, and *thaw*. Koontz-Garboden (2005) observes that crosslinguistically, state-denoting words based on each root class fall into two morphologically distinct classes. Those based on property concept roots are generally morphologically simple (adjectives in languages with that category), while those based on caused-result roots are generally deverbal, so that for example there is no basic adjective underlying *thaw* (cf. adjective *red* underlying *redden*). Furthermore, basic property concept adjectives do not entail an event of change, but (deverbal) caused-result adjectives do (e.g., *The book is red* entails no reddening, but *The ice is thawed* entails a thawing). Finally, as Rappaport Hovav (2011) shows, verbs containing caused-result roots also have only repetitive readings with *again*, giving the following for *thaw* and *melt*:

(74) a. John thawed the meat again.   (necessarily two ''defrostings'')
    b. John melted the soup again.   (necessarily two ''defrostings'')
       (Rappaport Hovav 2011:7, (14))

If, as Koontz-Garboden (2011) argues, roots of caused-result verbs have special denotations like (75), the necessarily repetitive reading with *again* follows just as with *guillotine*.

(75) $[\![thaw]\!] = \lambda x \lambda e_1[thawed'(x, e_1) \wedge \exists e_2[cause'(e_2, e_1)]]$

Thus, manner-of-killing verbs pattern exactly like verbs with caused-result roots: there are no underlying basic adjectives (e.g., no adjective for *guillotine*); adjectives that *are* based on them are deverbal and entail a prior event (e.g., #*He was guillotined, but there was no guillotining*); and *again* has only a repetitive reading. The only difference is that manner-of-killing roots encode not just that there was a cause, but also a specific manner, and if they occupy result root position (recall the *re-* facts), the lack of a restitutive reading follows.

As a side note, this root typology may also explain an observation by Chierchia and McConnell-Ginet (1990:359) that not all change-of-state verbs admit restitutive readings, noting that

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[27] The reviewer also notes that this is a place where lexicalist and syntactic accounts of event structures differ. On a Dowty-style lexicalist account, the lack of a scopal reading over the ACT predicate must be analyzed as the absence of a meaning postulate generating that reading, something that is not independently motivated. On a syntactic theory where causation is introduced by some causal head v and manner roots are analyzed as incorporated or head-adjoined to it, *again*-modification is ruled out independently since it targets phrasal constituents, and the causal head is an X^0 category. We are sympathetic to the syntactic account on these grounds, though ultimately the analysis of this fact is independent of our analysis of manner-of-killing roots.

John cleaned the floor again only has a repetitive reading. If verbal *clean* contains a caused-result root, this would be explained. That said, verbal *clean* would be unusual in that it does have a corresponding basic adjectival form that does not require a prior event, potentially counterexemplifying the generalization that there are no simple adjectives based on caused-result roots. An explanation would be that the roots underlying both uses of *clean* are not the same: the adjective has a basic property concept root, and the verb a caused-result root. But, as a reviewer points out, this is unexpected given the generalization typically associated with decompositional analyses that the implicational relationship between the verb and basic adjective (i.e., that *John cleaned his room* entails *His room is clean*) follows from the shared root (rather than stipulation). Furthermore, this begs the question of why they share the same form. It is beyond the scope of this article to address these broader issues, but we simply suggest that if verbs based on both property concept and caused-result roots exist independently, it would not be unexpected that some lexical drift might occur between two historically related, lexicalized forms. Nonetheless, this does not affect our claim that manner-of-killing verbs are built on the previously attested, well-behaved class of caused-result roots, albeit encoding not just a cause but also a manner of the cause.

6.4 Manner+Result Roots as ''Manner'' Roots

Next, we should ask whether the same scope facts obtain for the other classes we discussed in section 5, namely, manner-of-cooking and ditransitive ballistic motion verbs. One issue here is that *again* requires that a change of state can occur twice, and while it is possible to construct such cases with killing using the common understanding that certain mythical creatures can return from the dead, this strikes us as more difficult to motivate for manner-of-cooking verbs (e.g., that onions, once sautéed, can become uncooked), and thus we set these aside. But for ballistic motion verbs like *throw*, a change of location and/or possession can of course be undone, and so we might ask about the behavior of *again* here. As Beavers (2011a) discusses (see section 5.1), the meaning of ballistic motion verbs is that the agent releases the ball in a particular manner, and it (possibly) comes to be with the recipient.[28] However, as Beck and Johnson (2004:113–116) discuss, applying *again* to ditransitives generates a restitutive reading where a result state of possession obtains (or is at least intended), and where that possession state had obtained before, but *not* that it had obtained via throwing or releasing.

(76) a. John flipped Sandy the can again.
     b. John threw Sandy the ball again.
     c. John tossed Sandy the packet of peanuts again.

That *again* takes scope over the possession but not the throwing suggests that there *are* two roots, counterexemplifying complementarity as a claim even about event structures.

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[28] As discussed by Beavers (2011a), *actual* possession by the recipient need not obtain, though it must be the case that the recipient is capable of possession (see also Beck and Johnson 2004). We ignore this here.

However, there is reason to believe this is not the case. In particular, it is widely assumed (e.g., Gropen et al. 1989, Pinker 1989, Harley 2003, Beck and Johnson 2004, Rappaport Hovav and Levin 2008, Beavers 2011a) that the result state of possession found in double object constructions is contributed not by the root but by the event structure itself via some primitive HAVE predicate, predicting that all double object constructions require possession regardless of the root that occurs in them. Conversely, the roots of *throw*-type verbs contribute the ballistic manner and a separate result of releasing. On this analysis, *again* in (76) takes scope over just the result contributed by HAVE, and nothing contributed by the root. This can be easily accommodated if the roots of *throw*-type verbs, unlike those of manner-of-killing verbs, occupy the position of manner roots rather than that of result roots, giving a schematized event structure such as the one in (77a), with the scope position of restitutive *again* given in (77b) (assuming a version of *again* that can apply to dyadic states).

(77) a. $[[x \: ACT_{\langle throwing \rangle} \: z] \: CAUSE \: [y \: HAVE \: z]]$
b. $[[x \: ACT_{\langle throwing \rangle} \: z] \: CAUSE \: ([y \: again(HAVE) \: z])]$

Thus, on the analysis in (77a), there is only one root in the event structure, correctly predicting the behavior of *again* with ballistic motion verbs, albeit with the event structure contributing an additional result that can act as an attachment point for *again*. Interestingly, here the root is a manner root that happens to contribute a result, the opposite of what is found with manner-of-killing verbs, suggesting that manner+result roots may occupy either result or manner position, though more work is needed to determine when these possibilities occur.

6.5 Manner+Result Roots versus Lexical Resultatives

In sum, the lack of restitutive readings for manner+result verbs is naturally accommodated if we assume that these verbs indeed contribute only one root meaning at a time, maintaining assumption (i), but that this root encodes both a manner and a result simultaneously, dispensing with assumption (ii). This yields at least three different types of roots with regard to result and manner: result roots (e.g., for *destroy*, *redden*), manner roots (e.g., for *jog*, *run*), and manner+result roots (e.g., manner-of-killing verbs).[29] The alternative—allowing multiple roots in "lexical resultative" structure—requires additional mechanisms to rule out restitutive readings otherwise attested with resultative event structures. Thus, while each approach involves dropping one of RH&L's assumptions, the manner+result root approach is preferable, as it requires no additional assumptions. Indeed, given that manner and result are two independently attested types of meanings truth-conditionally, the null hypothesis should be that there are roots encoding both (consistent with Grimshaw's (2005:85) claim that verbs are not constrained in terms of the complexity of the truth conditions they encode). Furthermore, this approach brings manner-of-killing roots in line with the previously attested caused-result roots, explaining the adjective facts as well. But

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[29] Exactly how this finding fits in with claims about the broader typology of roots (e.g., as per Rappaport Hovav and Levin 1998, Harley 2005, Levinson 2007) is an area worth exploring in future research.

what about maintaining assumption (i)? Does this follow from anything? As far as we can tell, it is a stipulation, since there is no a priori reason why a monomorphemic verb could not be associated with an event structure that idiosyncratically specifies both a manner and a result root. However, whatever determines (i), the facts with manner+result verbs follow, since it entails that all of the idiosyncratic meaning of a verb is packaged into a single root. Thus, while manner/result complementarity is not a truth-conditional fact about word meaning per se, it is a structural one following from the number of roots an event structure can have.

7 Concluding Remarks

Impossible verbs, such as verbs with ''too much'' real-world content, are an important issue in work on lexical semantics, and RH&L's claim that there are no verbs encoding both manner and result simultaneously is one that may figure into a range of facts about lexicalization, morphosyntax, and typology. Our point of departure has been to view such a claim as highlighting a tension between what a verb may literally encode—its truth-conditional content—and what possible event structures determine that meaning in Universal Grammar.

   We have reviewed and developed diagnostics for manner and result meaning (qua nonscalar and scalar change, respectively, following RH&L) that are crucially (a) independent of one another and (b) based primarily on truth-conditional facts about the meanings of these components. These diagnostics also shed some additional light on what exactly these two meaning components are, though many questions are left for future work, including how to formalize the notion of manner. Using these tests, we have shown that some manner-of-killing, ballistic motion, and manner-of-cooking verbs encode both manner and result, counterexemplifying RH&L's manner/result complementarity hypothesis as a truth-conditional fact.

   However, we have also shown, using scopal diagnostics for structure in a verb's meaning, that one of RH&L's key assumptions about how word meanings are built—that there is only one root per verb—is valid. Thus, to accommodate manner+result verbs there must exist a third class of manner+result roots, contra RH&L's assumptions. This means that constraints on event structures may not constrain possible verb meanings truth-conditionally. This is not to say that such correlations do not exist—only that one cannot necessarily look at properties of event structures to deduce possible/impossible word meanings (see Dowty 1979:125–129 for additional discussion).

   Nonetheless, there may still be some validity to truth-conditional manner/result complementarity. It could be that, for functional reasons, the default lexicalization pattern in languages is pure manner and result verbs, which can be combined through general combinatoric processes (such as resultative constructions) into predicates with both meanings, and true manner+result roots arise only in specialized domains where certain manner+result combinations are frequent or significant (e.g., killing and cooking). This would not blunt the predictive power of manner/result complementarity. We noted in section 1 that Beavers, Levin, and Tham (2010) derive Talmy's (1972, 1985, 2000) typology partly from manner/result complementarity. However, Talmy's typology is only a tendency, and as Beavers, Levin, and Tham themselves note, the preferences toward manner versus path encoding in the verb would follow if complementarity

were also just a tendency. In any event, much can be learned about the nature of lexical meaning from strong falsifiable hypotheses like RH&L's manner/result complementarity hypothesis.

References

Aske, John. 1989. Path predicates in English and Spanish: A closer look. In *Proceedings of the Fifteenth Annual Meeting of the Berkeley Linguistics Society*, ed. by Kira Hall, Michael Meacham, and Richard Shapiro, 1–14. Berkeley: University of California, Berkeley Linguistics Society.

Baker, Mark C. 1997. Thematic roles and syntactic structure. In *Elements of grammar*, ed. by Liliane Haegeman, 73–137. Dordrecht: Kluwer.

Beavers, John. 2008. Scalar complexity and the structure of events. In *Event structures in linguistic form and interpretation*, ed. by Johannes Dölling, Tatjana Heyde-Zybatow, and Martin Schäfer, 245–265. Berlin: Mouton de Gruyter.

Beavers, John. 2011a. An aspectual analysis of ditransitive verbs of caused possession in English. *Journal of Semantics* 29:1–54.

Beavers, John. 2011b. On affectedness. *Natural Language and Linguistic Theory* 29:335–370.

Beavers, John, Beth Levin, and Shiao Wei Tham. 2010. The typology of motion events revisited. *Journal of Linguistics* 46:331–377.

Beavers, John, and Cala Zubair. To appear. Anticausatives in Sinhala: Involitivity and causer suppression. *Natural Language and Linguistic Theory*.

Beck, Sigrid, and Kyle Johnson. 2004. Double objects again. *Linguistic Inquiry* 35:97–124.

Beck, Sigrid, and William Snyder. 2001. The resultative parameter and restitutive *again*. In *Audiatur vox sapientiae: A festschrift for Arnim von Stechow*, ed. by Caroline Féry and Wolfgang Sternefeld, 48–69. Berlin: Akademie Verlag.

Bittner, Maria. 1999. Concealed causatives. *Natural Language Semantics* 7:1–78.

Chierchia, Gennaro, and Sally McConnell-Ginet. 1990. *Meaning and grammar: An introduction to semantics*. Cambridge, MA: MIT Press.

Cruse, D. A. 1973. Some thoughts on agentivity. *Journal of Linguistics* 9:11–23.

Davis, Anthony R. 2001. *Linking by types in the hierarchical lexicon*. Stanford, CA: CSLI Publications.

Davis, Anthony R., and Jean-Pierre Koenig. 2000. Linking as constraints on word classes in a hierarchical lexicon. *Language* 76:56–91.

Dixon, R. M. W. 1982. *Where have all the adjectives gone? And other essays in semantics and syntax*. The Hague: Mouton.

Dowty, David. 1979. *Word meaning and Montague Grammar*. Dordrecht: Reidel.

Dowty, David. 1989. On the semantic content of the notion 'thematic role'. In *Properties, types, and meaning*. Vol. 2, *Semantic issues*, ed. by Gennaro Chierchia, Barbara H. Partee, and Raymond Turner, 69–130. Dordrecht: Kluwer.

Embick, David. 2004. On the structure of resultative participles in English. *Linguistic Inquiry* 35:355–392.

Fillmore, Charles. 1970. The grammar of hitting and breaking. In *Readings in English transformational grammar*, ed. by Roderick Jacobs and Peter Rosenbaum, 120–133. Waltham, MA: Ginn.

Folli, Raffaella, and Heidi Harley. 2004. Consuming results: Flavors of little-*v*. In *Aspectual enquiries*, ed. by Paula Kempchinsky and Roumyana Slabakova, 1–25. Dordrecht: Kluwer.

Folli, Raffaella, and Gillian Ramchand. 2002. Event structure composition: The case of goal of motion and resultative constructions in Italian and Scottish Gaelic. In *Perspectives on Aspect Conference*, ed. by Henk J. Verkuyl, 81–106. Utrecht: OTS.

Goldberg, Adele. 2010. Verbs, constructions, and semantic frames. In *Syntax, lexical semantics, and event structure*, ed. by Edit Doron, Malka Rappaport Hovav, and Ivy Sichel, 39–58. Oxford: Oxford University Press.

Grimshaw, Jane. 2005. *Words and structure*. Stanford, CA: CSLI Publications.

Gropen, Jess, Steven Pinker, Michelle Hollander, Richard Goldberg, and Ronald Wilson. 1989. The learnability and acquisition of the dative alternation in English. *Language* 65:203–257.

Guerssel, Mohamed, Ken Hale, Mary Laughren, Beth Levin, and Josie White Eagle. 1985. A cross-linguistic study of transitivity alternations. In *CLS 21*. Vol. 2, *Parasession on Causatives and Agentivity*, ed. by William H. Eilfort, Paul D. Kroeber, and Karen L. Peterson, 48–63. Chicago: University of Chicago, Chicago Linguistic Society.

Hale, Ken, and Samuel Jay Keyser. 1987. A view from the middle. Lexicon Project Working Papers 10. Cambridge, MA: MIT, Center for Cognitive Science.

Hale, Ken, and Samuel Jay Keyser. 1993. On argument structure and the lexical expression of syntactic relations. In *The view from Building 20: Essays in linguistics in honor of Sylvain Bromberger*, ed. by Ken Hale and Samuel Jay Keyser, 53–109. Cambridge, MA: MIT Press.

Hale, Ken, and Samuel Jay Keyser. 1997. The limits of argument structure. In *Theoretical issues at the morphology-syntax interface*, ed. by Amaya Mendikoetxea and Myriam Uribe-Etxebarria, 203–230. Bilbao: Universidad del Pais Vasco, Euskal Herriko Unibertsitatea.

Hale, Ken, and Samuel Jay Keyser. 2002. *Prolegomenon to a theory of argument structure*. Cambridge, MA: MIT Press.

Harley, Heidi. 2003. Possession and the double object construction. In *Linguistic variation yearbook 2*, ed. by Pierre Pica and Johan Rooryck, 31–70. Amsterdam: John Benjamins.

Harley, Heidi. 2005. How do verbs get their names? Denominal verbs, manner incorporation, and the ontology of verb roots in English. In *The syntax of aspect*, ed. by Nomi Erteschik-Shir and Tova Rapoport, 42–64. Oxford: Oxford University Press.

Haspelmath, Martin. 1993. More on the typology of inchoative/causative verb alternations. In *Causatives and transitivity*, ed. by Bernard Comrie and Maria Polinsky, 87–120. Amsterdam: John Benjamins.

Hay, Jennifer, Christopher Kennedy, and Beth Levin. 1999. Scalar structure underlies telicity in degree achievements. In *Semantics and Linguistic Theory (SALT) 9*, ed. by Tanya Matthews and Devon Strolovitch, 127–144. Ithaca, NY: Cornell University, Cornell Linguistics Circle.

Holisky, Dee Ann. 1987. The case of the intransitive subject in Tsova-Tush (Batsbi). *Lingua* 71:103–132.

Husband, Matt E. To appear. Rescuing manner/result complementarity from certain death. In *CLS 47*. Chicago: University of Chicago, Chicago Linguistic Society.

Jackendoff, Ray. 1990. *Semantic structures*. Cambridge, MA: MIT Press.

Kearns, Kate. 2000. *Semantics*. New York: St. Martin's Press.

Kennedy, Christopher, and Beth Levin. 2008. Measure of change: The adjectival core of degree achievements. In *Adjectives and adverbs: Syntax, semantics, and discourse*, ed. by Louise McNally and Christopher Kennedy, 156–182. Oxford: Oxford University Press.

Kennedy, Christopher, and Louise McNally. 2005. Scale structure, degree modification, and the semantics of gradable predicates. *Language* 81:345–381.

Koenig, Jean-Pierre, and Anthony R. Davis. 2001. Sublexical modality and the structure of lexical semantic representations. *Linguistics and Philosophy* 24:71–124.

Koontz-Garboden, Andrew. 2005. On the typology of state/change of state alternations. *Yearbook of Morphology* 2005:83–117.

Koontz-Garboden, Andrew. 2009. Anticausativization. *Natural Language and Linguistic Theory* 27:77–138.

Koontz-Garboden, Andrew. 2010. The lexical semantics of derived statives. *Linguistics and Philosophy* 33: 285–324.

Koontz-Garboden, Andrew. 2011. The roots of change of state verbs. Paper presented at Approaches to the Lexicon (Roots III), Jerusalem, 14 June.

Kratzer, Angelika. 1996. Severing the external argument from its verb. In *Phrase structure and the lexicon*, ed. by Johan Rooryck and Laurie Zaring, 109–137. Dordrecht: Kluwer.

Kratzer, Angelika. 2000. Building statives. In *BLS 26*, ed. by Lisa J. Conathan, Jeff Good, Darya Kavitskaya, Alyssa B. Wulf, and C. L. Alan Yu, 385–399. Berkeley: University of California, Berkeley Linguistics Society.

Krifka, Manfred. 1998. The origins of telicity. In *Events and grammar*, ed. by Susan Rothstein, 197–235. Dordrecht: Kluwer.

Krohn, Laurie. 2008. The manner/result complementarity and verbs of the manner of death. Undergraduate Grammatical Semantics class essay, The University of Manchester, United Kingdom.

Lakoff, George. 1965. On the nature of syntactic irregularity. Doctoral dissertation, Indiana University, Bloomington. Published as *Irregularity in syntax*. New York: Holt, Rinehart and Winston (1970).

Levin, Beth. 1993. *English verb classes and alternations: A preliminary investigation*. Chicago: University of Chicago Press.

Levin, Beth. 2008. A constraint on verb meanings: Manner/result complementarity. Paper presented at Cognitive Science Department Colloquium Series, Brown University, Providence, RI, 17 March.

Levin, Beth, and Malka Rappaport Hovav. 1991. Wiping the slate clean: A lexical semantic exploration. *Cognition* 41:123–151.

Levin, Beth, and Malka Rappaport Hovav. 1995. *Unaccusativity: At the syntax–lexical semantics interface*. Cambridge, MA: MIT Press.

Levin, Beth, and Malka Rappaport Hovav. 2008. Lexicalized manner and result are in complementary distribution. Paper presented at the 24th Meeting of the Israel Association for Theoretical Linguistics, The Hebrew University of Jerusalem, October 26–27.

Levinson, Lisa. 2007. The roots of verbs. Doctoral dissertation, New York University.

Marantz, Alec. 1997. No escape from syntax: Don't try morphological analysis in the privacy of your own lexicon. In *Proceedings of the 21st Annual Penn Linguistics Colloquium*, ed. by Alexis Dimitriadis, Laura Siegel, Clarissa Surek-Clark, and Alexander Williams, 201–225. Pennsylvania Working Papers in Linguistics 4.2. Philadelphia: University of Pennsylvania, Penn Linguistics Club.

Marantz, Alec. 2007. Restitutive *re-* and the first phase syntax/semantics of the VP. Paper presented at the University of Maryland, College Park, 20 April.

Marantz, Alec. 2009. Roots, *re-*, and affected agents: Can roots pull the agent under little v? Paper presented at Stuttgart Roots Workshop, Universität Stuttgart, 12 June.

Pesetsky, David. 1995. *Zero Syntax: Experiencers and cascades*. Cambridge, MA: MIT Press.

Pinker, Steven. 1989. *Learnability and cognition: The acquisition of argument structure*. Cambridge, MA: MIT Press.

Pylkkänen, Liina. 2008. *Introducing arguments*. Cambridge, MA: MIT Press.

Ramchand, Gillian. 2008. *Verb meaning and the lexicon: A first phase syntax*. Cambridge: Cambridge University Press.

Rappaport Hovav, Malka. 2008. Lexicalized meaning and the internal structure of events. In *Theoretical and crosslinguistic approaches to the semantics of aspect*, ed. by Susan Rothstein, 13–42. Amsterdam: John Benjamins.

Rappaport Hovav, Malka. 2011. Building scalar changes. Ms., The Hebrew University of Jerusalem.

Rappaport Hovav, Malka, and Beth Levin. 1998. Building verb meanings. In *The projection of arguments: Lexical and compositional factors*, ed. by Miriam Butt and Wilhelm Geuder, 97–134. Stanford, CA: CSLI Publications.

Rappaport Hovav, Malka, and Beth Levin. 2001. An event structure account of English resultatives. *Language* 77:766–797.

Rappaport Hovav, Malka, and Beth Levin. 2008. The English dative alternation: The case for verb sensitivity. *Journal of Linguistics* 44:129–167.

Rappaport Hovav, Malka, and Beth Levin. 2010. Reflections on manner/result complementarity. In *Syntax, lexical semantics, and event structure*, ed. by Edit Doron, Malka Rappaport Hovav, and Ivy Sichel, 21–38. Oxford: Oxford University Press.

Reinhart, Tanya. 1996. Syntactic effects of lexical operations: Reflexives and unaccusatives. In *OTS working papers in linguistics*. Utrecht: Utrecht University, Utrecht Institute of Linguistics. Available at www.let.uu.nl/˜tanya.reinhart/personal/.

Reinhart, Tanya. 2002. The theta system: An overview. *Theoretical Linguistics* 28:229–290.

Shibatani, Masayoshi. 1976. The grammar of causative constructions: A conspectus. In *The grammar of causative constructions*, ed. by Masayoshi Shibatani, 1–39. New York: Academic Press.

Simpson, Jane. 1983. Resultatives. In *Papers in Lexical-Functional Grammar*, ed. by Lori Levin, Malka Rappaport, and Annie Zaenen, 143–157. Bloomington: Indiana University Linguistics Club.

Slobin, Dan I. 2000. Verbalized events: A dynamic approach to linguistic relativity and determinism. In *Evidence for linguistic relativity*, ed. by Susanne Niemeier and René Dirven, 107–138. Amsterdam: John Benjamins.

Snyder, William. 2001. On the nature of syntactic variation: Evidence from complex predicates and complex word-formation. *Language* 77:324–342.

Son, Minjeong. 2007. Directionality and resultativity: The cross-linguistic correlation revisited. *Nordlyd: Tromsø working papers on language and linguistics 34*, special issue on Space, Motion, and Result, ed. by Monika Bašić, Marina Pantcheva, Minjeong Son, and Peter Svenonius, 126–164. Tromsø: University of Tromsø. Available at www.ub.uit.no/munin/nordlyd/.

Stechow, Arnim von. 1995. Lexical decomposition in syntax. In *Lexical knowledge in the organization of language*, ed. by Urs Egli, Peter E. Pause, Christoph Schwarze, Arnim von Stechow, and Götz Wienold, 81–118. Amsterdam: John Benjamins.

Stechow, Arnim von. 1996. The different readings of *wieder* 'again': A structural account. *Journal of Semantics* 13:87–138.

Stechow, Arnim von. 2003. How are results represented and modified? Remarks on Jäger & Blutner's anti-decomposition. In *Modifying adjuncts*, ed. by Ewald Lang, Claudia Maienborn, and Cathrine Fabricius-Hansen, 517–554. Berlin: Mouton de Gruyter.

Talmy, Leonard. 1972. Semantic structures in English and Atsugewi. Doctoral dissertation, University of California, Berkeley.

Talmy, Leonard. 1976. Semantic causative types. In *The grammar of causative constructions*, ed. by Masayoshi Shibatani, 43–116. New York: Academic Press.

Talmy, Leonard. 1985. Lexicalization patterns. In *Language typology and syntactic description*, ed. by Timothy Shopen, 3:57–149. Cambridge: Cambridge University Press.

Talmy, Leonard. 1988. Force dynamics in language and cognition. *Cognitive Science* 12:49–100.

Talmy, Leonard. 2000. *Toward a cognitive semantics*, vol. 2. Cambridge, MA: MIT Press.

Tenny, Carol. 1992. The aspectual interface hypothesis. In *Lexical matters*, ed. by Ivan A. Sag and Anna Szabolcsi, 1–27. Stanford, CA: CSLI Publications.

Tenny, Carol. 1994. *Aspectual roles and the syntax-semantics interface*. Dordrecht: Kluwer.

Van Valin, Robert D., Jr., and Randy J. LaPolla. 1997. *Syntax: Structure, meaning, and function*. Cambridge: Cambridge University Press.

Van Valin, Robert D., Jr., and David P. Wilkins. 1996. The case for ''effector'': Case roles, agents, and agency revisited. In *Grammatical constructions: Their form and meaning*, ed. by Masayoshi Shibatani and Sandra A. Thompson, 289–322. Oxford: Oxford University Press.

Voorst, Jan van. 1995. The semantic structure of causative constructions. *Studies in Language* 19:489–523.

Washio, Ryuichi. 1997. Resultatives, compositionality, and language variation. *Journal of East Asian Linguistics* 6:1–49.

Wechsler, Stephen. 1989. Accomplishments and the verbal prefix *re-*. In *Proceedings of NELS 19*, ed. by Juli Carter and Rose-Marie Déchaine, 419–434. Amherst: University of Massachusetts, Graduate Linguistic Student Association.

Wechsler, Stephen. 2005a. Resultatives under the 'event-argument homomorphism' model of telicity. In *The syntax of aspect*, ed. by Nomi Erteschik-Shir and Tova Rapoport, 255–273. Oxford: Oxford University Press.

Wechsler, Stephen. 2005b. What is right and wrong about little-*v*. In *Grammar and beyond: Essays in honour of Lars Hellan*, ed. by Mila Vulchanova and Tor A. Åfarli, 179–195. Oslo: Novus Press.

Wienold, Götz. 1995. Lexical and conceptual structures in expressions for movement and space: With reference to Japanese, Korean, Thai, and Indonesian as compared to English and German. In *Lexical knowledge in the organization of language*, ed. by Urs Egli, Peter E. Pause, Christoph Schwarze, Arnim von Stechow, and Götz Wienold, 301–340. Amsterdam: John Benjamins.

Wolff, Phillip. 2003. Direct causation in the linguistic encoding and individuation of causal events. *Cognition* 88:1–48.

Wolff, Phillip. 2007. Representing causation. *Journal of Experimental Psychology: General* 136:82–111.

Wolff, Phillip, Aron K. Barbey, and Matthew Hausknecht. 2010. For want of a nail: How absences cause events. *Journal of Experimental Psychology: General* 139:191–221.

Wolff, Phillip, and Grace Song. 2003. Models of causation and the semantics of causal verbs. *Cognitive Psychology* 47:1–57.

Wunderlich, Dieter. 1997. Cause and the structure of verbs. *Linguistic Inquiry* 28:27–68.

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