Cinderella broke and broke: Object deletion and manner-result complementarity

Lilia Rissman
University of Chicago

1 Introduction
The question of how much meaning can be encoded in a single word is a central issue in natural language semantics. In this paper, I test the theory that verbs display manner-result complementarity: that verbs either describe an action performed by an agent, or a change undergone by a patient, but not both (Rappaport-Hovav & Levin 2010). Given data from an acceptability judgment experiment as well as a corpus study, I propose that instrumental verbs such as slice and chop are counterexamples to complementarity. These results suggest that verbal meaning is packaged into a single verbal root (see Beavers & Koontz-Garboden 2012), but that this verbal root may be associated with more than one part of an event structure.

2 Background

2.1 Manner-result complementarity
Numerous researchers have observed that verbs tend to fit into categories with respect to how they describe an event: verbs such as scrub, nibble, rub and memorize, for example, highlight an action or activity performed by an agent, whereas verbs such as break, freeze, melt and darken highlight a change of state in an individual (Fillmore 1970; Pinker 1989; Kiparsky 1997). Rappaport-Hovav & Levin propose that this distinction is a hard constraint on the relationship between verbs and event structures. Following on the theory of argument structure in Rappaport-Hovav & Levin (1998), they propose that verbs are associated with particular abstract event structures composed of primitive predicates. The verbs scrub and break, for example, are associated with the event structures in (1a-b):

(1)  
   a. \[ [x \text{ ACT-} \text{SCRUB} \text{-} y] \]
   b. \[ [[x \text{ ACT}] \text{ CAUSE [BECOME [y <BROKEN>]]}] \]

Scrub is a manner verb by virtue of the fact that its verbal root modifies the ACT predicate. By contrast, break is a result verb because its verbal root is an argument of the predicate BECOME. Verbal roots are understood to be non-decomposable bundles of fine-grained semantic features, encoding, for example, the difference between drink, gulp and sip.

---

* This work was supported by an NIH postdoctoral supplement awarded to Lilia Rissman and Susan Goldin-Meadow, parent grant RO1 DC000491. Thanks to Susan Goldin-Meadow, Diane Brentari, attendees of CLS 51 and members of the Neubauer sign & gesture lab group. A special thank you to all study participants.
In their 2010 paper, Rappaport-Hovav & Levin propose a lexicalization constraint whereby "a root can only be associated with one primitive predicate in an event schema" (5). That is, the root <SCRUB> can be associated with ACT or BECOME, but not both. The authors go on to articulate the distinction between manner and result verbs in terms of non-scalar vs. scalar change. For result verbs, the change undergone by the patient can be described as change along a scale: ascend, depart and go involve a spatial scale, whereas warm and cool involve a property scale, for example (see Kennedy 2001; Kennedy & McNally 2005; Kennedy & Levin 2008). Change of state verbs such as break, clean and open involve binary scales, where an object transitions discretely from the state of being not broken, for example, to the state of being broken. Manner verbs, for their part, involve change that lacks a scalar structure. For scrub, for example, the agent performs a repeated motion (i.e. a change), but this change is not organized on a scale.

Challenges to manner-result complementarity have been proposed in Zlatev & Yangklang (2004), Cifuentes Ferez (2007), Goldberg (2010) and Beavers & Koontz-Garboden (2012). Beavers & Koontz-Garboden, for example, focus on manner-of-killing verbs such as guillotine and electrocute, arguing that these verbs encode both a result (i.e. death) and the manner of bringing about death (i.e. via guillotining or electrocuting). The authors articulate several diagnostics that distinguish between prototypical manner and result verbs such as scrub and break, and argue that manner-of-killing verbs pattern with both manner and result verbs on these diagnostics. Given these findings, Beavers & Koontz-Garboden argue that verbs encode only a single root, consistent with Rappaport-Hovav & Levin (2010), but that this root may be associated with both action and result components of an event. The denotation they propose for guillotine is shown in (2):

\[
\text{[guillotine]} = \lambda x \lambda e_1[\text{dead}'(x, e_1)] \land \exists e_2[\text{cause}'(e_2, e_1)] \land \forall e_3[\text{cause}'(e_3, e_1) \rightarrow \text{guillotining}'(e_3)]
\]

In (2), \(e_1\) is an event where the direct object \(x\) holds the property of being dead. At the same time, (2) specifies that all events that cause \(e_1\) are guillotining events. In this way, guillotine specifies both manner and result. In addition to manner-of-killing verbs, Beavers & Koontz-Garboden argue that manner-of-cooking verbs such as braise and sauté are counter-examples to complementarity, in addition to ballistic motion verbs such as throw and fling.

### 2.2 Instrumental verbs

Verbs such as chop, cut, slice and stab are also possible counter-examples to complementarity. Guerssel et al. (1985) describe cut as having the following semantics: that an individual \(x\) produces "a CUT on \(y\), by a sharp edge coming into contact with \(y\)" (51). This description includes both a manner and a result: \(y\) comes to have a cut in it, which is made via contact with an external object (i.e. an "instrument").
The controversy surrounding these instrumental verbs concerns not whether they encode result, but whether they in fact encode instruments. For *chop, cut, slice* and *stab*, the direct object changes in some way, shown through the denial-of-result diagnostic discussed in Beavers & Koontz-Garboden. On this diagnostic, instrumental verbs pattern like result verbs:

(3)  
a. #I broke the vase but nothing is different about it.  
b. I swept the floor but nothing is different about it.  
c. #I chopped the onion but nothing is different about it.  
d. #I cut the paper but nothing is different about it.

Result verbs (e.g. *break*) but not manner verbs (e.g. *sweep*) require that the patient undergoes a change, explaining the contrast in (3a-b). The infelicity of (3c-d) indicates that the patients of *chop* and *cut* also undergo a change. The incision in the patient may involve complete severance, as in *I sliced the bread for sandwiches*, or partial severance, as in *I accidentally sliced my thumb*.

Evidence from judgment studies and sentence processing studies indicate that these verbs encode instruments as well as results (Koenig, Mauner & Bienvenue 2002, 2003; Koenig, Mauner, Bienvenue & Conklin 2008; Rissman, Rawlins & Landau 2015). Koenig et al. (2003) find that subjects process instrumental with-PPs more rapidly after having heard an instrumental verb such as *slice*. Rissman et al. (2015) find that subjects judge an instrument to be crucial to the meaning of *slice, cut* and *chop*, but not to the meanings of verbs such as *eat, break* and *open*. Bohnemeyer (2007) also argues that instrumental verbs involve contact between an instrument and the patient, although he points out that these verbs "are rather flexible about the action performed and the instrument used (I can cut an orange using anything from a knife or axe to a metal string or laser beam, and I can do it by bringing the blade to bear on the fruit or by dropping the blade onto the fruit from sufficient height)" (159).

If instrumental verbs do encode instruments, then these verbs would pose a challenge to manner-result complementarity, as instruments are widely analyzed as being part of the causative subcomponent of an event (Talmy 1976; Croft 1991; Dowty 1991; van Valin & Wilkins 1996; Koenig et al. 2008; Rissman et al. 2015). That is, causative events are commonly analyzed in terms of a process subevent and a result subevent, where the process causes the result. Instruments are represented within the process subevent, because the action of the instrument contributes toward causing the result.

As a response to this challenge, Levin & Rappaport-Hovav (2013) analyze the verb *cut*, proposing that intuitions about the presence of an instrument are inferential in nature, rather than being part of the semantics of the verb. That is, because *cut* specifies an incision in the patient, we infer pragmatically that there must have been some type of object to create this incision. In their words, "an

---

1 Levin & Rappaport-Hovav (2013) argue that *cut* can have an instrumental sense, but only when the requirement for a result has been removed, as in the conative frame: *I cut at the rope around my*
examination of cutting events shows that cut specifies neither the instrument, nor the action that the instrument is involved in” (7).

2.3 Object deletion

If instrumental verbs are result verbs, and the instrument is inferred pragmatically, then instrumental verbs should pattern with prototypical result verbs such as break on a wide range of diagnostics. In this paper, I tested this prediction focusing on the diagnostic of object deletion shown in (4):

(4)  a. Cinderella scrubbed all night long.
    b. *Cinderella broke all night long.

Beavers & Koontz-Garboden (2012) argue that this test diagnoses result: if a verb allows object deletion, as in (4a), then this verb does not encode a result. Rappaport-Hovav (2008) explains this contrast in terms of the scalar semantics of result verbs: if a verb specifies a scale, then the entity changing along the scale cannot be omitted. (4b) is infelicitous because break encodes a two-point scale where its direct object changes from a non-broken to a broken state.

This linking hypothesis makes the prediction that instrumental verbs should be infelicitous in this construction, as they encode a scalar result. I conducted an experimental acceptability judgment study as well as a corpus study to test this prediction. In these studies, I compared the behavior of instrumental verbs against that of prototypical manner and result verbs such as scrub and break. As an additional control, I also tested result verbs which do not participate in the inchoative alternation, such as kill and clean:

(5)  a. The toddler broke the vase./The vase broke.
    b. The hunter killed the deer./*The deer killed.
    c. The waiter cleaned the glasses./*The glasses cleaned.

Although these verbs syntactically require an agent (and ostensibly encode the presence of an agent semantically as well), the linking hypothesis proposed by Rappaport-Hovav (2008) predicts that object deletion is prohibited for these verbs as well, as they clearly encode a result.

In my studies, I focused on a particular variant of object deletion, which I term the "x-and-x construction:"

(6)  a. Cinderella scrubbed and scrubbed all night long.
    b. *Cinderella broke and broke all night long.

legs but the knife was too dull. Thus, although there are result senses of cut and instrumental senses, complementarity holds of any individual sense.

2 In this study, I tested only "incision" verbs such as slice, chop and cut within the category of verbs that encode the presence of an instrument. Other instrumental verbs include beat, hit, write and stir (see Koenig et al. 2008). Given their varied semantics, additional studies are needed to assess whether these verbs are counterexamples to manner-result complementarity. In this paper, I use the term "instrumental verb" to refer specifically to incision verbs.
I made this choice for methodological reasons: investigating this specific construction allowed for easier identification of instances of object deletion in the corpus study described in Section 4. Crucially, I needed to identify senses where the subject is the agent rather than the patient of the event, e.g. excluding the Mickey Mouse doll broke.

In studies where researchers categorize verbs into discrete categories such as manner and result, researchers usually rely on a wide range of diagnostics, as different diagnostics do not operate in identical ways. This approach has many strengths, and the final account of instrumental verbs and manner-result complementarity will have to include data from a range of tests. The downside of this approach is that it is often infeasible to explore any single diagnostic in detail, e.g. testing many verbs in multiple sentences, or gathering judgment data from a large sample of people. In this paper, I focused on the x-and-x construction as a step towards correcting this methodological trade-off.

3 Study 1: judgment experiment
3.1 Participants
82 English-speaking adults were tested on Amazon Mechanical Turk (M = 45, F = 37). Participants self-reported as being native speakers of US English and received $0.30 in compensation. An additional 12 participants were tested but were excluded from analysis for failure to distinguish positive and negative control sentences (see Section 3.2 below).

3.2 Methods
Participants rated the naturalness of x-and-x sentences on a 7-point scale, where 1 = completely unnatural and 7 = completely natural. Sentences appeared in one of two sentence frames, with the verbs either sentence-final or sentence-medial:

(7) Sentence-final frame
a. We came home to find a sticky, greenish goo covering the kitchen floor – for days, we just scrubbed and scrubbed.
   b. The soldiers slaughtered the bison for the fun of it – from sunup to sundown, they just killed and killed.

(8) Sentence-medial frame
a. Throwing rocks through windows, the looters broke and broke until not a single window was intact.
   b. Working one carrot at a time, I diced and diced until all carrots were ready for the soup.

---

Participants were instructed that a native speaker of US English is someone who has lived in the US from birth until at least age 13, and whose parents spoke English to them during that time. To encourage honest self-reporting, participants were told that their responses to the native language question would not influence their eligibility for the study.
Sentences were constructed so as to provide a plausible reason why the agent would be performing an action repeatedly. In all sentences, an NP providing the identity of the deleted object was mentioned before the verb, e.g. in (7a) *kitchen floor* was mentioned before the verb *scrub*.

I tested six verbs from each of the categories described in Section 2.3:

<table>
<thead>
<tr>
<th>Proto-manner</th>
<th>Proto-result</th>
<th>Instrument</th>
<th>Non-inchoative result</th>
</tr>
</thead>
<tbody>
<tr>
<td>scrub</td>
<td>break</td>
<td>chop</td>
<td>kill</td>
</tr>
<tr>
<td>wipe</td>
<td>melt</td>
<td>cut</td>
<td>clean</td>
</tr>
<tr>
<td>hit</td>
<td>open</td>
<td>stab</td>
<td>destroy</td>
</tr>
<tr>
<td>kick</td>
<td>dim</td>
<td>slice</td>
<td>smash</td>
</tr>
<tr>
<td>sweep</td>
<td>shatter</td>
<td>snip</td>
<td>crush</td>
</tr>
<tr>
<td>slap</td>
<td>warm</td>
<td>dice</td>
<td>slaughter</td>
</tr>
</tbody>
</table>

Table 1: Verbs tested in Studies 1 & 2

Proto-manner verbs all involved surface contact. Instrumental verbs were all of the incision type discussed by Koenig et al. (2008). Proto-result verbs were all permissible in the inchoative frame, unlike the non-inchoative result verbs. Each verb appeared twice in the list of stimuli, once in each sentence frame, in two different contexts (e.g. looters breaking windows and recycling workers breaking glass bottles).

Each participant judged four x-and-x sentences, one from each of the four verb categories in Table 1. I asked participants to judge only a few sentences due to the salience of the x-and-x construction and concerns that participants would develop conscious strategies or be primed by previous responses over many trials. In addition to the four x-and-x sentences, participants also judged four positive and four negative control sentences as in (9-10):

(9) Positive control
   a. Jon’s stomach growled at the smell of food and he reached for one of the hot rolls in the basket.
   b. It took two days for the storm to pass, leaving us with snow drifts higher than my head.

(10) Negative control
   a. I grabbed my favorite blanket out of the closet and covered the blanket onto the couch.
   b. I have to thank my 10th grade English teacher for having learned me to appreciate poetry.

Control sentences were designed to be similar in length and complexity as the x-and-x sentences. On the 7-point scale, participants had to distinguish between the positive and negative controls by more than 1.5 points, or their x-and-x data was not analyzed.
3.3 Results & discussion
The mean naturalness rating of x-and-x sentences for each of the four verb types is shown in Figure 1, along with the means for the control sentences:

![Figure 1: Mean sentence ratings for each of the sentence types in Study 1, where 1 = totally unnatural and 7 = totally natural. Error bars show 95% confidence interval of the mean.](image)

Participants distinguished positive and negative controls by a wide margin. Consistent with previous research, participants judged x-and-x sentences with proto-manner verbs to be felicitous, and sentences with proto-result verbs to be fairly infelicitous. As discussed in Section 2.3, this study tested the hypothesis that instrumental verbs and non-inchoative result verbs would not be felicitous with a deleted object, as these verbs encode a result. This prediction was not met: participants in Study 1 judged that sentences with instrumental and non-inchoative result verbs were as felicitous as sentences with proto-manner verbs. A Tukey's Honestly Significant Difference test revealed that the proto-result verbs were significantly different from the other three verb classes (all p-values < .001), but the three remaining verb classes were not different from each other (all p-values > .1).

To assess whether individual verbs behaved uniformly within each verb class, I analyzed the judgment means for each verb, shown in Figure 2:
Figure 2 shows a high degree of overlap among proto-manner, non-inchoative result and instrumental verbs. That is, at the individual verb level there is little evidence that these three classes of verbs behave differently from each other with respect to x-and-x object deletion. Figure 2: Mean sentence ratings for each individual verb in Study 1.

4 Notably, the mean judgment for open is higher than that of the other proto-result verbs. In Section 4.2, I discuss how open does appear in the x-and-x construction on Google in the context of repeatedly opening presents. In Study 1, the sentences including open also featured the opening-presents context. The results for open may have paralleled those of the other proto-result verbs if other contexts has been tested, e.g. opening doors, opening letters, etc.
would accept, as long as the gist of the sentences was easy to understand. To test this explanation, I conducted a corpus search on Google to assess how often instrumental and non-inchoative result verbs were produced spontaneously in the x-and-x construction.

4.1 Methods
For each verb in Table 1, I searched for the phrase "VERBed and VERBed" on Google. I chose Google for this search because of the rarity of this construction at the level of individual verbs -- a parallel search on the Corpus of Contemporary American English (Davies 2008-) yielded only several dozen examples across all the verbs in Table 1. From the results of the Google search, I coded 100 instances of the construction for each verb, identifying object deletion uses, i.e. where the subject was the agent.

Because these results needed to be filtered by hand, I am not able to provide true quantitative data for this study. The search "swept and swept," for example, yielded 1.34 million results. I therefore separated the verbs into one of three bins: where I found more than 20 instances of the construction (well-attested) vs. 1-19 instances (weakly attested) vs. no instances (unattested).

4.2 Results & discussion
As predicted, each of the proto-manner verbs was well-attested in this construction. Examples are shown in (11):

(11) Proto-manner verbs
    a. George scrubbed and scrubbed and scrubbed and to his surprise the black came off the rock and what was left was nothing but shiny gold.
    b. He slapped and slapped and slapped until he got a cry. The Doctor said, ‘You have a boy.’

By contrast, five out of the six proto-result verbs were unattested in this construction. The verb open was weakly-attested in this construction, but only in the particular context of repeatedly opening presents on Christmas day:

(12) Proto-result verbs
    Mom always went overboard. I opened and opened and opened. No Fat Wheels. Then finally... the very last present I opened was a Fat Wheels!

Consistent with previous research and the results of Study 1, proto-result verbs do not appear to be felicitous in this construction.

5 To eliminate passive uses of these verbs in the search results, I narrowed my search to include a pronominal subject, e.g. "I broke and broke," "he broke and broke," etc. Although there were many hits for these verbs with this more specific search, I did not find any that were instances of object deletion. By contrast, there were many inchoative uses, e.g. I am known to be a very strong woman to some, but I broke and broke hard.
As with the proto-manner verbs, each of the instrumental verbs was well attested in this construction. Examples are shown in (13):

(13)  **Instrumental verbs**

a. She sliced and sliced until she had piles of beautiful zucchini noodles.

b. They stabbed and stabbed and stabbed, until the person was dead. Then they turned and pointed their knives toward me.

Thus for instrumental verbs, the judgment study and corpus study converge on the same result, that instrumental verbs are felicitous in the x-and-x construction.

Turning to the non-inchoative result verbs, object deletion uses were well-attested for *kill, clean* and *smash*. By contrast, I found less than five examples each for *destroy, slaughter* and *crush*. Examples for these verbs are shown in (14):

(14)  **Non-inchoative result verbs**

a. [a soldier operating a tank] For three days, I just destroyed and destroyed. The whole area. Any house that they fired from came down.

b. [preparing to snort OxyContin tablets] I crushed and crushed and finely chopped and crushed more, til only a fine powder existed.

c. [A religious cult] That was the way they chanted while they slaughtered and slaughtered and slaughtered.

For these three verbs, the results from the Google search diverge from those of the judgment experiment: while they were not entirely unattested in this construction, the rates of observing them did not approach those of the proto-manner and instrumental verbs, which numbered in the tens of thousands, if not more.

5  **Complementarity revisited**

In Studies 1 & 2, I found that instrumental verbs and non-inchoative result verbs patterned with prototypical manner verbs with respect to object deletion, rather than patterning with prototypical result verbs. These findings suggest an alternate linking hypothesis to the one suggested by Rappaport-Hovav (2008): rather than the scalar structure of a result blocking object deletion, I propose that agentive meaning licenses object deletion. Prototypical result verbs are infelicitous in the x-and-x construction not because they encode a result, but because they fail to encode any kind of agent-oriented meaning. Instrumental verbs, in turn, were felicitous in this construction because they do encode agent-oriented meaning, specifically the presence of an instrument. This evidence therefore supports the argument that instrumental verbs are counterexamples to manner-result complementarity.

5.1  **Instrumental verb representation**

What is the agent-oriented meaning encoded by the six incision verbs tested in this study? The semantic representation proposed by Guerssel et al. (1985) for *cut* is repeated in (15):

(15)  $x$ produces CUT on $y$, by sharp edge coming into contact with $y$
I propose two refinements to this analysis: first, the "sharp edge" that comes into contact with the patient, i.e. the instrument, does not need to be sharp in any absolute sense. As discussed by Bohneneyer (2007), you can cut metal with a laser, or slice a ripe banana with a taut string, or even cut a cake with a thin laptop computer. All that is required of the instrument is that it have the appropriate shape to make an incision in the patient, where an incision is defined relative to the physical size and composition of the patient. In other words, a taut string is a sufficient cutting instrument for a cake, but not for a piece of paper.

A second refinement/clarification to (15) is that the individual x is not necessarily an animate agent. There must be some causal entity such that the instrument comes in contact with the patient, but this entity can include machines as well as natural forces:

(16) a. The helicopter blade chopped the soldier's arm off.
    b. The torrents of water cut through the soft rock of the canyon.
    c. The flying shrapnel sliced the tree in half.

Incision verbs require the presence of a relatively sharp object, but the nature of the force that brings this instrument into contact with the patient is fairly underspecified. In this paper, I use the terms "agentive meaning" and "agent" to include not just animate actors/causers, but also causal entities of the kind in (16). In this way, I consider the presence of an instrument to be part of agentive meaning (see Rissman et al. 2015).

Given this perspective on instrumentality, I propose that the incision verbs can be represented within the framework in Beavers & Koontz-Garboden (2012). Recall that in this framework, verbs only specify a single verbal root, but this root may be associated with both action and result components of an event. The denotation of slice is shown in (17):

(17) $\text{\llbracket slice\rrbracket} = \\
\lambda x \lambda e.1 [\text{sliced}'(x, e_1) \land \exists e_2 [\text{cause}'(e_2, e_1)] \land \forall e_3 [\text{cause}'(e_3, e_1)] \rightarrow \text{slicing}'(e_3)]]$

In this denotation, the predicate sliced' represents the particular incision made in the patient, whereas the predicate slicing' represents the force of a relatively sharp object making contact with the patient. The details of these predicates is verb-specific: stab but not cut, for example, requires that the incision have an elongated rather than lateral shape (see Koenig et al. 2008 for further discussion).

As discussed in Section 2.2, Levin & Rappaport-Hovav (2013) argue that cut is a pure result verb and not a counterexample to complementarity. They suggest that the semantics of cut requires a clean incision in the patient, and that we infer the presence of an instrument given the nature of the incision. Crucially, the instrument is not part of the lexical semantics of cut. Several pieces of evidence weigh against this explanation. First, if the presence of the instrument is derived pragmatically, we would expect to find more examples of cutting and slicing events where no

---

instrument is present. That is, incision verbs should behave similarly to a verb like break, which does not place any constraint on the shape of the object that comes into contact with the patient. If we allow that instruments need not be sharp in an absolute sense, but only relatively sharp given the size and substance of the patient, I am not aware of any examples of incision events without an instrument. In addition, the psycholinguistic behavior reported in Koenig et al. (2003) and Rissman et al. (2015) is difficult to account for if the instrument is only inferred pragmatically, and not encoded lexically by the verb.

Finally, it is possible to construct examples that distinguish between cut and break, where two events have the same endstate in the patient, but where only one event involves a relatively sharp instrument. Imagine two metal semi-spheres that have been glued together to form a whole sphere. If I take a knife and insert it between the two semi-spheres such that I sever the glue, I can say I cut the sphere in half. If, however, I hit the top of the sphere with a flat mallet so that the glue cracks and the two semi-spheres fall apart, I cannot say I cut the sphere in half. These two events result in the same endstate, but the shape of the instrument predicts the choice of verb. This example highlights the type of contact needed between the instrument and the patient: the shape of the instrument must parallel the shape of the incision.

5.2 Understanding object deletion

As discussed above, I propose that the x-and-x construction targets agentive meaning. In particular, this construction highlights an atelic event in which the agent repeatedly performs an action. Given this highlighting of the agent's action, the direct object may be deleted, if the verb encodes some type of action on the part of the agent.

This interpretation of the x-and-x construction raises two questions: 1) how general are the findings of this study across different instances of object deletion and 2) what type of verbal agentive meaning licenses object deletion? As for the first question, recall from Section 3.2 that the sentences tested in Study 1 were all fairly long, with precise reasons given why an agent was performing an action repeatedly. The identity of the missing direct object was also always mentioned before the verb. In a sense, the semantic richness of these sentences provided a level playing field for each of the verb types: the participants judging the sentences were given ample opportunity to understand why a particular verb was being used in an deleted-object way.

This level playing field underscores the importance of the result that participants still judged the prototypical result verbs to be fairly infelicitous. In other words, it is not the case that any verb can be good in any sentence frame given appropriately supportive context. But would prototypical manner, instrumental and non-inchoative result verbs all behave similarly in more sparse sentence contexts, or given an object deletion construction that does not highlight repeated action? Intuitively, sentences like (18a-d) sound good but perhaps not (19a-c):
(18)  a. Cinderella scrubbed all night long.
     b. Cinderella swept all afternoon.
     c. The chef sliced and diced all afternoon.
     d. Cinderella cleaned all night.

(19)  a. The doctor slapped all afternoon.
     b. The murderer stabbed for one hour.
     c. The wrecking crew destroyed all day.

Given the subtlety of these judgments and potential for variation across verbs and contexts, I believe this question should be addressed using experimental methods. In other words, we need additional studies to address whether there is an interaction between verb type and object deletion construction type, and what the implications are for our understanding of the syntax/semantics interface.

Turning to the issue of what kind of verbal agentive meaning licenses the x- and-x construction, it may be that not all types of agentive meaning have equal effects. Consider, for example, the non-inchoative result verbs. Although sentences with these verbs were judged to be equally felicitous as sentences with the prototypical manner verbs, x-and-x sentences with destroy, slaughter and crush were poorly attested in the Google corpus. A possible explanation is that non-inchoative result verbs encode agentive meaning in a relatively weak way: although they require the presence of an agent, they say little about what this agent must do. For this reason, non-inchoative result verbs may exhibit more variability in this construction than proto-manner verbs, e.g. they may be less robust to changes in contextual richness, as described above.

I discussed in Section 2.1 that verb types beyond the instrumental verbs tested in this study have been argued to be counterexamples to manner-result complementarity, including manner-of-killing verbs, manner-of-cooking verbs, and ballistic motion verbs (see Beavers & Koontz-Garboden 2012). My interpretation of the object deletion diagnostic makes the prediction that these additional verb types should all be felicitous in the x-and-x construction, as they all encode agentive meaning. The data in (20), for example, are predicted to be felicitous:

(20)  a. Starting with the shortest of the prisoners, the executioner guillotined and guillotined until all the prisoners were dead.
     b. After opening the bags of vegetables, the chef sautéed and sautéed until all the vegetables were cooked.
     c. The game show contestant needed to get all the Frisbees to the other side of the stage – he threw and threw until there were no Frisbees left.

The subtlety of these judgments calls for an experimental investigation. If sentences with these verbs are not as felicitous as sentences with proto-manner verbs, it may not be possible to explain object deletion simply in terms of agentive meaning. Husband (2011), for example, argues that agentive and result meanings can differ.
as to whether they are presupposed or part of at-issue content, which may have different effects on object deletion judgments.

6 Conclusion
In this study, I used experimental and corpus data to argue that object deletion diagnoses agency, not result. Given previous research that instruments are represented as part of the agentive portion of an event, these results suggest that instrumental verbs encode both agentive and result meaning, contra the manner-result complementarity hypothesis. This study demonstrates the value of in-depth exploration of a single linguistic diagnostic in a controlled experimental setting. These results raise questions about how agentive and result meanings interact when a verb encodes both, and how this interaction influences argument realization.

References


