The semantics of roots determines argument structure[1]

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Abstract. A challenge for theories of argument structure that take verb meanings to decompose into so-called roots and event templates (Rappaport Hovav and Levin, 1998; Ramchand, 2008; Alexiadou et al., 2015, *i.a.*) relates to successfully accounting for the distribution of roots, as not all roots seem to appear in the same syntactic contexts. In this respect, an influential approach holds that roots are indifferent to syntactic distribution, and therefore that in principle any root can appear in any context (Borer, 2005, 2013; Mateu and Acedo-Matellán, 2012; Acedo-Matellán and Mateu, 2014). Another influential approach on the other hand classifies roots into semantic classes constraining the syntactic contexts roots can appear in (Marantz, 1997; Harley and Noyer, 2000; Reinhart, 2002; Alexiadou et al., 2006; Ramchand, 2008). Here, I show that the two main approaches to argument structure either undergenerate (Rappaport Hovav and Levin, 1998; Alexiadou et al., 2015) or overgenerate (Borer, 2005; Acedo-Matellán and Mateu, 2014). In particular, I provide empirical data that show that so-called result verbs enjoy a certain degree of elasticity, contra Rappaport Hovav and Levin (1998); Alexiadou et al. (2015), yet there are cases of lack of verbal elasticity, contra Borer (2005); Acedo-Matellán and Mateu (2014), *i.a.* To this end, I propose a root-sensitive approach to event structure in which the semantics of distinct classes of roots can determine the syntactic contexts roots can appear in. Under the present approach, cases of ungrammaticality are argued to result from clashes between the semantics of roots and the semantics of the event structure.

Keywords: argument structure, event structure, verb meaning, roots, manner, result.

1. Introduction

Event structural theories of verb meaning take verb meanings to consist of an event structure that decomposes into event templates and roots (see Dowty, 1979; Goldberg, 1995; Rappaport Hovav and Levin, 1998; Ramchand, 2008; Alexiadou et al., 2015). Event templates define the temporal and causal structure of the event, whereas roots provide idiosyncratic information (also called conceptual content or encyclopedic information) about the event. Such theories thus assume a strong division of labor between roots and event templates, i.e., what defines the grammatical properties of a surface verb is the event template and not the root (see Embick, 2004, 2009; Arad, 2005; Borer, 2003, 2005, 2013; Dunbar and Wellwood, 2016, *i.a.*). In other words, it is generally assumed that there is a 'clean divide', namely, if there is an entailment of change, it is because there is the corresponding event template introducing such an entailment, e.g., the operator BECOME (as in Dowty, 1979; Rappaport Hovav and Levin, 1998) or little v_{CAUSE} in syntactic decompositional theories of verb meaning (cf. Chomsky, 1995; Embick, 2004). In this vein, Embick (2009) proposed the Bifurcation Thesis for Roots whereby roots cannot contain structural components of meaning, i.e., the meanings introduced by event templates (see also the Root Hypothesis of Arad, 2005; also Borer, 2005 and Dunbar and Wellwood, 2016).

(1)   Bifurcation Thesis for Roots (BT-R): If a component of meaning is introduced by a semantic rule that applies to elements in combination [= an event template], then that component of meaning cannot be part of the meaning of a Root.   (Embick, 2009: 2)

Under event structural theories of verb meaning, templatic meanings such as causation or change are thus assumed to be introduced solely by event templates, and never by roots. In the lexical event structures of Rappaport Hovav and Levin (1998) as in (2) (based on Dowty, 1979) templatic meanings reside in operators such as BECOME or CAUSE.

(2)   a.   John broke the vase.
        b.   [[John CAUSE [the vase BECOME *<BREAK>*]]]

Similarly, in syntactic approaches that hold that verbs are built in the syntax by merging roots and event templates, defined by functional heads in the verbal domain, entailments of causation or change are introduced by projections such as the verbalizing little *v* head (see Marantz, 1997; Hale and Keyser, 2002; Harley, 2003; Folli and Harley, 2005; Borer, 2003, 2005; Mateu and Acedo-Matellán, 2012; Acedo-Matellán and Mateu, 2014; Alexiadou et al., 2015, *i.a.*).

(3)   John broke the vase.   (from Beavers and Koontz-Garboden, 2020)
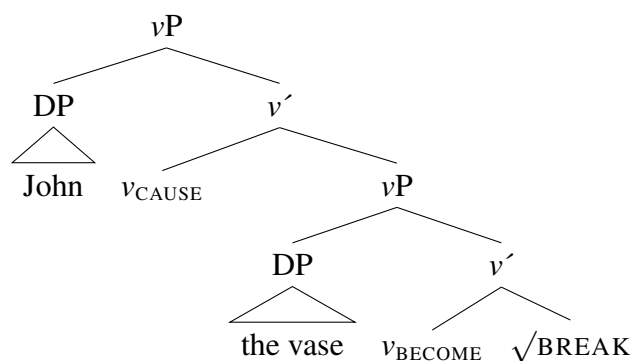
In short, under event structural theories, roots denoting states such as $\sqrt{\text{BREAK}}$ are stative and only acquire an entailment of change when they are associated with the corresponding event template. The roots of change-of-state verbs such as *break* or *redden* only differ then in the (real-world) information they provide about the state they denote.

In the present paper, I specifically focus on the syntactic distribution of roots, i.e., how roots are associated with the event structure. In this respect, there are two main approaches that substantially differ in how they tackle this question. One influential approach classifies roots into semantic classes determining their distribution in the event structure, whereas another influential approach takes roots to be devoid of any grammatical information therefore predicting that any root can in principle appear in any event template. Here, I show that none of these approaches are successful in capturing the syntactic distribution of roots insofar as they either undergenerate or overgenerate. I lay out a root-sensitive approach to event structure in which the semantics distinct classes of roots have determine how roots are associated with the event structure. I argue then that this root-sensitive approach to event structure is able to capture the distinct argument realization/structure patterns of what at first blush appear to be the same class of verbs. Under the present approach, cases of ungrammaticalities thus result from clashes between the semantics of the roots and the semantics of the event structure.

I proceed as follows. Section 2 provides a short overview of the two influential approaches to event structure which have proposed different ways to account for the syntactic distribution of roots. I note that neither approach successfully captures what event templates distinct classes of roots appear in. In Sections 3 and 4, I lay out the present root-sensitive approach to argument and event structure. Section 5 concludes the paper.

2. The syntactic distribution of roots

A challenge for theories of event structure, whether lexical or syntactic, relates to successfully accounting for the syntactic distribution of roots. In other words, a theory of event structure must be able to capture how roots are associated with the event structure. Broadly speaking, there are two main influential approaches that tackle these questions: what Rappaport Hovav (2017) calls Free Distribution (FD) approaches and Grammatically Relevant Ontological Categories (GROC) approaches.

The FD approach is significantly represented by Borer (2003, 2005, 2013); Mateu and Acedo-Matellán (2012); Acedo-Matellán and Mateu (2014); Acquaviva (2008, 2014). On this view, roots are indifferent to syntactic distribution, i.e., in principle any root can appear in any syntactic context. In this respect, Borer (2013: 403-417, 436-470) holds that roots are phonological indices without any content insofar as content is only introduced when roots appear together with some specific grammatical context. Similarly, Acedo-Matellán and Mateu (2014) (also Borer, 2005; Mateu and Acedo-Matellán, 2012) argue that any root can appear in any context, yet cases of apparent ungrammaticalities are simply incompatibilities between the semantics introduced by the event templates and the conceptual content of the root. FD approaches thus strongly reject the idea that roots can have content that is grammatically relevant, i.e., content that can determine root distribution, since on this view, roots are not constrained in terms of the syntactic structures they can be associated with. Under these approaches, roots are argued to acquire a semantic interpretation depending on which event templates roots are associated with (Acedo-Matellán and Mateu, 2014: 18). Thus, FD approaches hold that the semantics of the event structure is solely determined by the event templates and roots simply fill in real-world details about the event.

The GROC approach is adopted in Marantz (1997); Rappaport Hovav and Levin (1998); Harley and Noyer (2000); Reinhart (2002); Embick (2004); Harley (2005); Alexiadou et al. (2006, 2015); Ramchand (2008), *i.a.*[2] On this view, roots fall into grammatically relevant semantic classes defined by their ontological type. The ontological type a root bears is argued to determine syntactic distribution, i.e., how roots are associated with the event structure. In this vein, Rappaport Hovav and Levin (1998, 2010) influentially proposed that roots fall into two broad semantic classes, i.e., manner and result. Manner roots, e.g., *wipe*, encode manners of carrying out an action and are therefore argued to be associated with the event structure as modifiers of the so-called ACT operator (4), notated via subscripts. Result roots, e.g., *break*, on the other hand, encode states and are therefore argued to be associated with the event structure as complements of the BECOME operator (5).

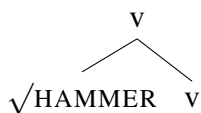[2]Under Ramchand (2008)'s approach, roots come instead with specific features that constrain the event templates they can appear in. Although Ramchand does not classify roots into semantic classes as Rappaport Hovav and Levin do, her approach is still in the spirit of GROC approaches since it is some grammatically relevant specification of the root that determines what event templates roots appear in.
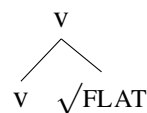
(4)   [John ACT $<_{WIPE}>$]   (5)   [The vase BECOME $<BREAK>$]

Following Rappaport Hovav and Levin (1998, 2010), Alexiadou et al. (2006, 2015) (also Embick, 2004; Harley, 2005) adapt this ontological-type classification in the Distributed Morphology tradition (Halle and Marantz, 1993) whereby roots are merged as modifiers or complements of verbalizing heads in the verbal domain. In the spirit of Rappaport Hovav and Levin (1998), Alexiadou et al. (2015: 14) thus propose that manner roots are merged as modifiers of the verbalizing little *v* head through direct merge (6) (see Embick, 2004; McIntyre, 2004; Harley, 2005; Mateu, 2012), whereas result roots instead are merged as complements of the little *v* head (7).

(6)   Roots as modifiers of *v* specifying the   (7)   Roots as complements of *v* specifying
        manner of the event   the result of the event.

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        v                                    v
       / \                                  / \
      /   \                                /   \
  √HAMMER  v                             v   √FLAT
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GROC approaches thus share the assumption that the ontological-type classification of roots determine how they are associated with the event structure, i.e., as modifiers or complements of certain operators or projections in the verbal domain.

2.1. Predictions of FD and GROC approaches

The two main approaches to event structure make completely distinct predictions regarding how roots are associated with the event structure. On the one hand, GROC approaches such as the one in Rappaport Hovav and Levin (1998) and Alexiadou et al. (2015) predict that manner roots are always associated with the event structure as modifiers, whereas result roots instead are to be associated with the event structure as complements. FD approaches, on the other hand, predict that any root can in principle be both a modifier or a complement in different constructions since roots are not assumed to bear an ontological-type classification determining their distribution in the event structure.

Within the GROC approaches, Rappaport Hovav and Levin (1998) influentially proposed that the classification of manner and result accounts for the fact that manner and result verbs appear to exhibit different argument structure patterns. Namely, Rappaport Hovav and Levin (as well as Alexiadou et al., 2015) predict that so-called result verbs—verbs encoding changes of state/location, e.g., *break*, *freeze*, *burn*, *melt* etc.—should disallow constructions where the verbal root is inserted as an event modifier. This is because, as discussed above, roots that bear the ontological-type classification of result are always complements, and never event modifiers. Such a prediction is apparently borne out insofar as Rappaport Hovav and Levin contend only manner roots are accepted in constructions where the verbal root is inserted as a modifier of the event, as illustrated below (examples (8) from Rappaport Hovav and Levin 1998: 1-2, example (10b) from Jackendoff 1990: 241).

(8)   a.   Kim scrubbed her fingers raw.
               [[Kim ACT $<_{SCRUB}>$] CAUSE [her fingers BECOME $<RAW>$]]

      b.   *The toddler broke his hands bloody.
           *[[The toddler ACT $<_{BREAK}>$] CAUSE [his hands BECOME $<BLOODY>$]]

(9)   a.   John hammered the metal flat.
           [[John ACT $<_{HAMMER}>$] CAUSE [the metal BECOME $<FLAT>$]]
     b.   *John broke the vase valueless.
           *[[John ACT $<_{BREAK}>$] CAUSE [the vase BECOME $<VALUELESS>$]]

(10)   a.   John danced into the hotel.
           [[John ACT $<_{DANCE}>$] BECOME $<IN\ THE\ HOTEL>$]]
     b.   *The rocket burned into the hotel.
           *[[The rocket ACT $<_{BURN}>$] BECOME $<IN\ THE\ HOTEL>$]]

Namely, in these examples, the verbal root is associated with the event structure as a modifier of the event as it provides the manner of action with which a result state (denoted by result phrases) is brought about. Thus, (8a) can be paraphrased as *Kim caused her fingers to become raw by scrubbing* (further see Embick, 2004; McIntyre, 2004; Harley, 2005; Mateu, 2012). At first blush, it seems that GROC approaches are more successful than FD approaches in accounting for the syntactic distribution of roots, insofar as certain classes of roots, i.e., result roots, cannot be event modifiers, as illustrated by the examples above.

In what follows, I show, however, that neither approach successfully captures the syntactic distribution of (result) roots. In particular, I note that FD approaches overgenerate, as there is a class of result verbs that never appear as event modifiers. Similarly, I also note that GROC approaches undergenerate, as there is a distinct class of result verbs that apart from being complements in the event structure can also be associated with the event structure as event modifiers. To account for such a variation in the argument structure patterns of result verbs, I lay out a root-sensitive approach towards event structure whereby the semantics that distinct classes of roots can have is grammatically relevant insofar as it determines their syntactic distribution.

3. A root-sensitive approach to event structure

The root-sensitive approach to event structure that I develop here departs from Rappaport Hovav and Levin (1998) and Alexiadou et al. (2015) and GROC approaches in general in assuming ontological types of roots that determine their syntactic distribution. Namely, under the present approach, roots do not bear an ontological-type classification determining their association with the event structure. To make my case, I start by providing naturally occurring data (11)-(15) that show that the roots of result verbs can appear as event modifiers, contra Rappaport Hovav and Levin (1998) and Alexiadou et al. (2015).[3]

(11)   a.   With a few slices of her claws, she tore him free. (GBooks)
     b.   A couple of monks broke the corpse loose from the deck. (COCA)
     c.   We blasted the tops off mountains. (COCA)

(12)   a.   I stuck my GoPro under some ice and then shattered a hole right above it. (Web)
     b.   Scientist just melted a hole through 3,500 feet of ice. (Web)
     c.   A [...] team blew a hole in the wall near the embassy and charged through. (COCA)

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(13) a. The team has enough fuel to melt through the ice a second time. (COCA)
     b. Hellfire missiles tore into the compound killing six alleged militants. (Web)
     c. The bullets ripped into the tissue of his back and shoulder and exited the right side of his neck. (GloWbE)

(14) a. All-news channels are now splitting the niche smaller and smaller. (GloWbE)
     b. Frankie was pulling a lever that wound his cables in and crushed it tighter. (COCA)
     c. With the dark brown rock she crushed it dead. (GBooks)

(15) a. [...] bacon might be overcooked and the cheese might melt out of the hamburger. (GloWbE)
     b. A lot of the water sprayed onto the ship had frozen onto the steel. (GloWbE)
     c. Millions of bottles that are [...] and then burned into the atmosphere. (GloWbE)

Namely, the examples in (11)-(15) involve cases of canonical result verbs in constructions equivalent to those in (8)-(10) insofar as the verbal root is associated with the event structure as an event modifier, instead of as a complement, as one would expect under Rappaport Hovav and Levin's and Alexiadou et al.'s approaches. In these constructions, the result state is denoted by a result phrase which is in turn inserted as the complement (cf. *hammer$_{manner}$ the metal flat$_{result}$* (9a)). These examples thus violate Rappaport Hovav and Levin's and Alexiadou et al.'s ontological-type classification insofar as the roots of result verbs are inserted as event modifiers as it is the APs and PPs that actually denote the result state which appear in the complement position of the event template (cf. (8)-(10)).[4]

However, I also depart from FD approaches, e.g., Borer (2003, 2005, 2013); Mateu and Acedo-Matellán (2012); Acedo-Matellán and Mateu (2014), in assuming that roots are indifferent to syntactic distribution. Namely, I reject the idea assumed within FD approaches that the content of roots cannot be grammatically relevant. Under the present approach, the content of certain classes of roots can indeed be grammatically relevant as it can determine the syntactic structures that roots can be associated with, as I argue below. To this end, I start by providing data that show that not all types of result verbs can be associated with the event structure as event modifiers, contra what one would expect under FD approaches.

(16) a. *I thinned the soup tasteless.   (Rappaport Hovav 2014a: 276)
     b. *We dimmed the room empty.   (Rappaport Hovav 2008: 23)

(17) a. *The kid opened the ball into the garden.   (Alessandro Bigolin p.c.)
         (Cannot mean: cause the ball to go into the garden by opening a door)
     b. *The doctor whitened his teeth clean.
         (Cannot mean: cause the teeth to become clean by whitening)
     c. *The sky darkened the city hard to see.   (Louise McNally p.c.)
         (Cannot mean: cause the city to become hard to see by darkening)

These examples show cases of result verbs in constructions like the ones in (11)-(15): the roots of result verbs are associated with the event structure as event modifiers, insofar as the complement position is taken by the result phrases denoting changes of state or location (e.g., *into the garden* and *clean*). In particular, as Embick (2009) observes, the roots of deadjectival result verbs such as *thin* never appear as event modifiers, contra what one would expect under FD

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[4]See Ausensi and Bigolin (under review) for a syntactic analysis of these constructions.

approaches like Borer (2005, 2013), Mateu and Acedo-Matellán (2012) and Acedo-Matellán and Mateu (2014).[5]

(18)   *John opened/darkened/blackened + DP + Result XP. (Embick 2009: 7)

These data show that FD and GROC approaches either undergenerate or overgenerate when accounting for the syntactic distribution of roots. Namely, the roots of result verbs enjoy a certain degree of elasticity as a class of result verbs do appear as event modifiers, contra GROC approaches. Yet, there is another class of roots, i.e., the roots of deadjectival result verbs, that never appear as event modifiers, contra FD approaches. In the next section, in light of these data, I lay out a root-sensitive approach to argument structure in which the semantics of certain classes of roots determine syntactic distribution, and therefore whether a certain class of roots can be associated with the event structure as event modifiers as well as complements is largely determined by the semantics of such a class of roots.

3.1. The semantics of roots

Following Embick (2009), I assume there are two classes of result verbs: those from roots such as $\sqrt{\text{BREAK}}$ which can be event modifiers, and those from roots such as $\sqrt{\text{COOL}}$ where coercion into event modifiers is not possible, as they are always complements. In particular, I follow Beavers and Koontz-Garboden (2020) in calling the former class Result Roots and the latter Property Concept Roots. Crucially, though, only Result Roots introduce entailments of change on their own, i.e., they inherently comprise structural components of meaning as part of their meaning, contra the Bifurcation Thesis for Roots.

Beavers and Koontz-Garboden (2020) argue Result Roots (e.g., $\sqrt{\text{MELT}}$, $\sqrt{\text{BREAK}}$, $\sqrt{\text{CRACK}}$) predicate a state of a unique participant but crucially require that such a state must be the result of a change. Result Roots thus contrast with Property Concept Roots (e.g., $\sqrt{\text{OPEN}}$, $\sqrt{\text{WIDE}}$, $\sqrt{\text{COOL}}$), i.e., the roots of deadjectival verbs such as *open*, which simply predicate a simple state of a participant. Both classes of roots are predicates of states, but only Result Roots introduce an entailment of change that gives rise to the state they denote.

(19)   a. $[\![\sqrt{\text{BREAK}}]\!] = \lambda x \lambda s [broken'(x, s) \wedge \exists e'[become'(e', s)]]$
         b. $[\![\sqrt{\text{COOL}}]\!] = \lambda x \lambda s [cool'(x, s)]$

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[5]It is important to note that in examples of the *open the door ajar* or *Michael's smile widened into a grin* type, the roots of deadjectival result verbs are not event modifiers; they associate with the event structure as complements insofar as the result states denoted by the result phrases are a further specification of the state encoded by the roots (see Rappaport Hovav and Levin, 2010; Beavers, 2011; Mateu, 2012), whereas in cases where the verbal roots are event modifiers (cf. *melt out of the hamburger*), the result phrases introduce distinct result states than the one encoded by the verbal roots. More importantly, Louise McNally (p.c.) points out that examples such as *The chute widened itself into a roundish, rectangular cave opening* pose a problem for the claim that the roots of deadjectival result verbs never appear as event modifiers (the logic being that in such examples the root $\sqrt{\text{WIDE}}$ associates with the event structure as a modifier, whereas the result state is denoted by the PP, as in examples of the *laugh oneself silly* type (see Mateu, 2012). Although I (currently) do not have an analysis for these examples, it is important to note that despite the fake reflexive, the result phrases appear to provide further specification about the result state of the verbal root, i.e., as in *open the door ajar*. These verbal roots can also appear without the fake reflexive in combination with result phrases that simply specify the result state of the verb, e.g., *The gulf between the classes has widened into an unbridgeable abyss*. For the present purposes, I assume that Embick (2009) is right in observing that there is a clear difference between the roots of deadjectival result verbs and the roots of result verbs of the *break* type, and leave such cases for further research.

Thus, contra the Bifurcation Thesis for Roots and theories assuming a division of labor between roots and event templates (see Borer, 2003, 2005, 2013; Arad, 2005; Mateu and Acedo-Matellán, 2012; Acedo-Matellán and Mateu, 2014; Alexiadou et al., 2015; Dunbar and Wellwood, 2016), I assume that certain classes of roots can introduce templatic meanings with grammatical consequences (Beavers and Koontz-Garboden, 2020; Ausensi et al., 2020; Ausensi, 2020). In particular, I argue that the semantics that certain classes of roots have (heavily) bears on their syntactic distribution.

3.2. The syntactic distribution of roots revisited

From the different semantics roots denoting states can have, it naturally follows then that Property Concept Roots are therefore prime candidates for being complements of the event structure as they denote simple states with no eventive properties. The roots of manner verbs, e.g., √POUND, on the other hand, are predicates of events: they denote actions, and are therefore prime candidates for being event modifiers.

(20) $[\![\sqrt{\text{POUND}}]\!] = \lambda x \lambda e [pound'(x, e)]$

In other words, as they are predicates of events, they frequently appear as modifying a causing subevent (e.g., *hammer the metal flat*) and rarely as complements (unless a state-like interpretation is coerced, as in the famous example *The tires are kicked*, cf. Kratzer, 2000; Embick, 2009).

The fact that Result Roots can be event modifiers, as illustrated in (11)-(15), is thus expected under the present account: the eventive properties allow them to associate with the event structure as event modifiers, contra GROC approaches as those in Rappaport Hovav and Levin (1998, 2010); Alexiadou et al. (2006, 2015). Namely, this class of roots generally take the position of complements in the event structure, since they predicate a state, but can also appear as event modifiers due to their eventive properties. In contrast, I propose that Property Concept Roots are never associated with the event structure as event modifiers as they denote pure (simple) states, i.e., the root is completely stative with no eventive properties. Beavers and Koontz-Garboden (2020) suggest that Result Roots always seem to be complements. Here, I have provided evidence that shows that Result Roots can also be event modifiers of the event structure.

Importantly, assuming that Result Roots have the denotation in (19a) predicts that Result Roots always introduce entailments of change independently of event templates. This prediction is borne out, since even when Result Roots are event modifiers, entailments of change cannot be severed from the meaning of the root. This, crucially, is left unexplained in analyses assuming roots do not have semantic content that is grammatically relevant (Borer, 2003, 2005; Acquaviva, 2014; Mateu and Acedo-Matellán, 2012; Acedo-Matellán and Mateu, 2014)

(21)   a.   We blasted the tops off mountains, #but nothing was blasted.
        b.   The bullets ripped into the tissue of his back and shoulder, #but the tissue wasn't ripped.
        c.   With the dark brown rock she crushed it dead, #but nothing was crushed.
        d.   Scientists just melted a hole through 3,500 feet of ice, #but the ice wasn't melted.

For instance, although in (21d) the verbal root √MELT is associated with the event structure as

a modifier as it provides the manner of the event—i.e., (21d) can be paraphrased as *Scientists created a hole through 3,500 feet of ice by melting*—the entailments of change encoded by √MELT cannot be severed from its meaning. In other words, Result Roots appear to keep their truth-conditional content even when they are structurally interpreted as providing the manner of the event (cf. Rappaport Hovav, 2017).

4. Beyond event modifiers and complements

In this section, I show how the semantics of another class of roots can further determine their syntactic distribution. By doing so, I provide an additional argument in favor of the present root-sensitive approach to event structure as a way to capture the syntactic distribution of roots. In particular, I focus on a specific class of roots, i.e., what Ausensi (2020) and Ausensi et al. (2020, under review) call √MURDER-type roots which include √MURDER, √SLAY, √ASSASSINATE, √SLAUGHTER and √MASSACRE. Here, I follow Ausensi (2020) in assuming that √MURDER-type roots inherently comprise entailments of intentionality associated with the external argument as part of their truth-conditional content, contra the Bifurcation Thesis for Roots.[6]

(22) $[\![\sqrt{\text{MURDER-type}}]\!] = \lambda x \lambda s [dead'(x, s) \wedge \exists e' \exists v [cause'(v, e') \wedge become'(e',s) \wedge \\ \forall v'[cause'(v',e') \rightarrow intentional'(v')]]]$ (from Ausensi, 2020)

Similar to the claim that entailments of change come from operators such as BECOME or from the verbalizing little *v* head in the verbal domain, under decompositional theories of verb meaning that assume that verbs are created in the syntax it is widely accepted that entailments of intentionality are solely introduced by event templates, and never by roots. For instance, under approaches following Kratzer (1996) (e.g., Alexiadou et al., 2015), entailments of intentionality are introduced by the functional head Voice$_{\text{AGENT}}$. Similarly, approaches in the Distributed Morphology tradition such as in Folli and Harley (2005, 2007, 2008) (see also Hale and Keyser, 1993, 1997, 2002; Chomsky, 1995) argue that entailments of intentionality reside in the verbalizing little *v* head, i.e., in the projection v_{DO}. Here, I follow previous work of mine with colleagues in arguing that some classes of roots can introduce entailments of intentionality associated with the external argument.
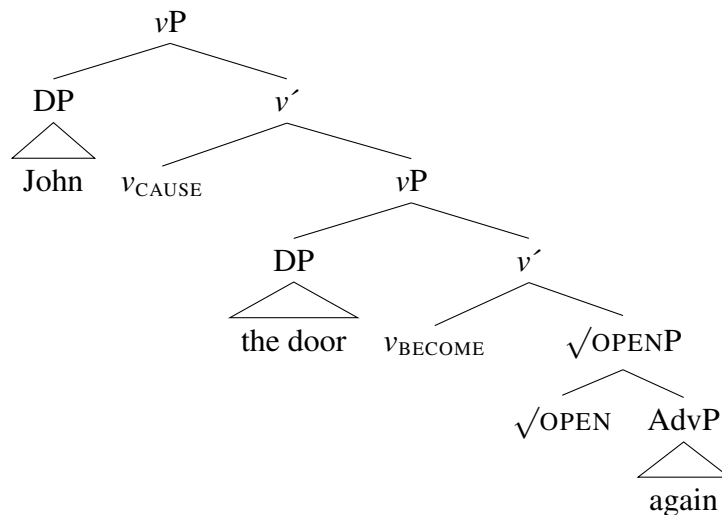
Crucial evidence for the claim that √MURDER-type roots introduce entailments of intentionality comes from sublexical modification with *again* (further see Beavers and Koontz-Garboden, 2020). At least since Dowty (1979), it is a well-known phenomenon that there exists a class of modifiers that can modify subparts of the event structure. For instance, the modifier *again* introduces a presupposition that the event it modifies has occurred before, thus allowing different interpretations depending on the structural height of its attachment site (see von Stechow, 1995, 1996, 2003; Beck and Johnson, 2004; Beck, 2006; Marantz, 2007, 2009).

An event structural approach to verb meaning neatly captures the fact that sublexical modification with *again* yields different readings depending on its scope in the event structure. Thus, in verbs with complex event structures such as in *John opened the door*, the modifier *again* yields multiple interpretations, i.e., the so-called restitutive and repetitive readings. The restitutive reading in the case of *John opened the door again* relates to restoring the door to a previous state of openness that the door had before (without entailing that such a previous state was the result of an opening). Restitutive readings thus follow from low scope, i.e., when *again* takes

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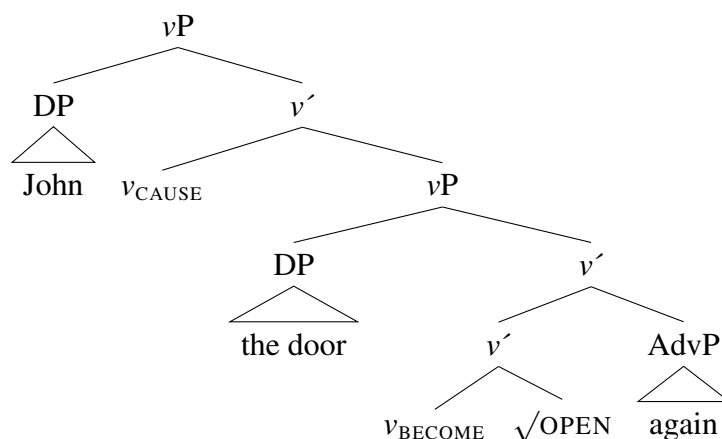[6]See Ausensi et al. (2020, under review) for a more nuanced view.

scope over the truth-conditional content of the root, and therefore since the root is assumed to denote a simple state, the reading will be restitutive (i.e., no change) (examples adapted from Beavers and Koontz-Garboden, 2020).

(23)   John opened the door again, and it had been open before.   (Restitutive)

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                        vP
                  ┌─────┴─────┐
                 DP           v´
                 △       ┌────┴────┐
               John   vCAUSE       vP
                             ┌──────┴──────┐
                            DP             v´
                            △         ┌────┴────┐
                        the door   vBECOME    √OPENP
                                          ┌─────┴─────┐
                                        √OPEN        AdvP
                                                      △
                                                    again
```
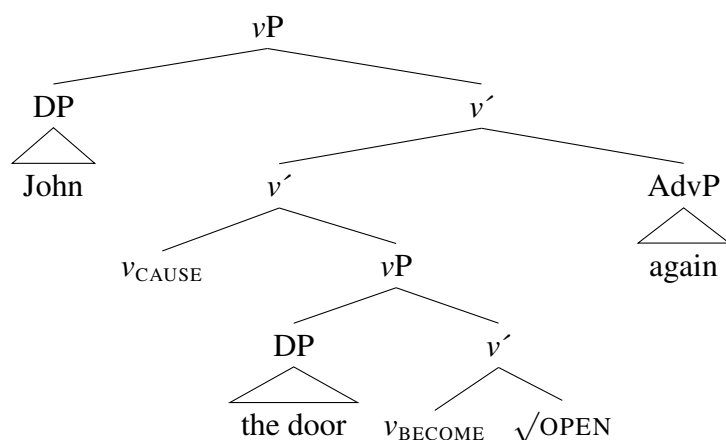
The example *John opened the door again* is also ambiguous between (at least) two repetitive readings, namely that John is repeating his own previous event of causing the door to open and the one where John is causing the door to open, and it had opened before (though such a previous opening may have had no cause or may have been caused by something or someone different than John, e.g., the door opening by itself).

(24)   John opened the door again, and it had opened before.   (Repetitive #1)

```
                        vP
                  ┌─────┴─────┐
                 DP           v´
                 △       ┌────┴────┐
               John   vCAUSE       vP
                             ┌──────┴──────┐
                            DP             v´
                            △         ┌────┴────┐
                        the door      v´       AdvP
                                   ┌───┴───┐    △
                               vBECOME  √OPEN  again
```

(25)   John opened the door again, and he had opened it before.   (Repetitive #2)

vP
├─ DP
│   └─ John
└─ v'
    ├─ v'
    │   ├─ v_{CAUSE}
    │   └─ vP
    │   ├─ DP
    │   │   └─ the door
    │   └─ v'
    │   ├─ v_{BECOME}
    │   └─ $\sqrt{\text{OPEN}}$
    └─ AdvP
        └─ again

Such an ambiguity follows if the event structure of causative uses of verbs such as *open* is the one as above, and therefore *again* can take scope over the root, producing restitutive readings, over the functional head v_{BECOME}, producing a repetitive reading that simply presupposes that the door had opened before and over the functional head v_{CAUSE}, which in this case necessarily presupposes that something or someone had caused the door to open before.[7] Thus, the different presuppositions that *again* yields follow from its structural attachment site, i.e., whether it takes scope over just the root, or over the functional heads introducing structural meanings of change and causation.

Regarding entailments of intentionality associated with the external argument, if these structural components of meaning are introduced externally to the root by functional heads such as Voice$_{\text{AGENT}}$ or v_{DO}, in sentences such as *John murdered the monster again* we should expect that a presupposition that excludes intentionality associated with the external argument is available. This is because when *again* attaches low, $\sqrt{\text{MURDER}}$-type roots should not entail intentionality, since such a templatic meaning is introduced higher up in the event structure by Voice$_{\text{AGENT}}$ or v_{DO}. To illustrate this, I note that such a prediction is certainly borne out in the case of roots of the $\sqrt{\text{KILL}}$ sort since such a class of roots does not introduce entailments of intentionality, and therefore *again* generates presuppositions that the event it modifies might not have been previously carried out intentionally, i.e., when it has low scope, since in this case *again* directly scopes over the truth-conditional content of the root and such a class of roots does not have intentionality as part of their meaning. This is illustrated in the examples below that are specifically designed to allow repetitive presuppositions that exclude intentionality. One way to show this is by explicitly stating that the previous killing was either unintentional or accidental or was brought about by an inanimate subject.

(26)   a.   CONTEXT: A monster king was killed by a magical storm. After being brought back to life by an evil wizard, a brave knight took his sword and stabbed him in the chest until it died.
              A brave knight killed the monster king again.
        b.   CONTEXT: A zombie previously killed itself by jumping off a cliff. After coming

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[7]See Bale (2007) and Ausensi et al. (2020, under review) for a more nuanced view of the types of repetitive presuppositions that *again* yields depending on the semantics of roots.

back to life, John took a gun and shot it in the head, immediately killing it.
John killed the zombie again.

Such a prediction, however, is certainly not borne out for $\sqrt{\text{MURDER}}$-type roots insofar as $\sqrt{\text{MURDER}}$-type roots systematically disallow presuppositions with *again* that exclude intentionality associated with the external argument. Namely, $\sqrt{\text{MURDER}}$-type roots are infelicitous in scenarios that entail that the previous event of killing was unintentional or accidental, in contrast to $\sqrt{\text{KILL}}$, as illustrated above.

(27)   a.   CONTEXT: A monster king was killed by a magical storm. After being brought back to life by an evil wizard, a brave knight took his sword and stabbed him in the chest until it died.
       #A brave knight assassinated the monster king again.
       b.   CONTEXT: A zombie previously killed itself by jumping off a cliff. After coming back to life, John took a gun and shot it in the head, immediately killing it.
       #John murdered the zombie again.

Such a contrast is predicted under the present account since even when *again* has the truth-conditional content of $\sqrt{\text{MURDER}}$-type roots in its scope, such a class of roots will entail intentionality since intentionality is part of their meaning.

In sum, approaches that assume that entailments of change or intentionality are introduced structurally, and not by roots, make some interesting predictions about the architecture of event structure and the nature of root meaning. It has been shown, however, that some predictions turn out to be contrary to fact in some cases, as in the present case for $\sqrt{\text{MURDER}}$-type roots. In particular, such approaches would predict that for $\sqrt{\text{MURDER}}$-type roots a presupposed previous event that excludes intentionality should be possible, yet this is never the case. Namely, if the semantics of the functional heads $\text{Voice}_{\text{AGENT}}$ and v_{DO} are severed from $\sqrt{\text{MURDER}}$-type roots, it is rather mysterious why the readings above in which the intentionality associated with the external argument is not included in *again*'s presupposition is not possible in the case of $\sqrt{\text{MURDER}}$-type roots. If we assume, on the other hand, that specific classes of roots have more complex meanings than previously assumed and in turn introduce structural components of meaning such as change and intentionality, the mysterious data such as the one above can be then naturally accounted for.

4.1. Against root ontological-type classifications

Before, I observed that in order to account for the fact that not all roots appear in the same contexts, GROC approaches propose that roots fall into distinct ontological-types depending on their idiosyncratic information. A domain where GROC approaches successfully capture the distribution of roots relates to accounting for what verb classes participate in the so-called anti-causative alternation (see Levin and Rappaport Hovav, 1995; Schäfer, 2008; Koontz-Garboden, 2009; Rappaport Hovav and Levin, 2012; Rappaport Hovav, 2014b; Alexiadou et al., 2015, *i.a.*). In this respect, Alexiadou et al. (2015: 56) (building on Marantz, 1997; Rappaport Hovav and Levin, 1998; Harley and Noyer, 2000; Reinhart, 2002; Alexiadou et al., 2006) propose an ontological-type classification of roots according to their encyclopedic information.

(28) $\sqrt{}$agentive (murder, assassinate)
       $\sqrt{}$internally caused (blossom, wilt)

√externally caused (destroy, kill)

√cause unspecified (break, open)

For instance, roots such as √MURDER are then argued to disallow the anticausative alternation (cf. *John murdered/assassinated* (on intended reading)) insofar as its ontological-type classification, that of agentive, requires them to be inserted in specific event structures, i.e., in event structures that contain Voice (see Kratzer, 1996), and since the anticausative variant (e.g., *The vase broke*) does not contain the presence of a Voice projection, this class of roots is then predicted not to appear in this alternation (see Alexiadou et al., 2015 for details on the absence of a Voice projection in the anticausative variant). While such an approach may capture the distributional properties of distinct classes of roots, it still leaves the facts about sublexical modification with *again* unexplained. In other words, they still do not explain why roots like √MURDER disallow repetitive readings that exclude intentionality associated with the external argument. More importantly, though, as Alexiadou et al. (2015: 55) themselves note, such a classification runs the risk of being purely descriptive and highly circular.

Here, I propose that such (*ad hoc*) classifications can be done away with if we acknowledge that root meanings can be more complex than previously assumed. In particular, recall that the approach that I have laid out has as its core claim that the semantics of the root must be compatible (to some extent) with the semantics of the event templates. Here, I take it one step further and propose that the locus of ungrammaticalities is in clashes between the semantics of the root and the semantics of the event structure. Note, thus, that this is critically different from FD approaches as in Borer (2005); Mateu and Acedo-Matellán (2012); Acedo-Matellán and Mateu (2014), *i.a.*, since they take such ungrammaticalities to be apparent as they are considered to be incompatibilities between the conceptual content of the root and the event structure. In contrast, I assume that some classes of roots come with structural components of meaning and in turn that clashes between the semantics of roots and the semantics of the event structure result in actual cases of ungrammaticalities. Namely, the present root-sensitive approach holds that the content of certain classes of roots is indeed grammatically relevant as it can determine grammatical properties of roots such as how they are associated with the event structure. In this respect, consider the anticausative variant again. Such a variant does not include the presence of an external argument, i.e., the anticausative variant descriptively involves an event of change of state of a participant without specifying the cause that gives rise to that event of change of state. Thus, if the semantics of √MURDER-type roots, as defined in (22), relates to predicating a state of a unique participant, but crucially requires that such a state must have a cause and that such a cause must be of specific type, i.e., an intentional-type action, it is expected then that verbs derived from such roots will never alternate between causative and inchoative uses, insofar as the anticausative variant excludes the presence of an agent argument, and agents are, by default, the only type of arguments compatible with intentionality (see Dowty, 1991). The present account thus has the advantage of capturing both the distributional properties of √MURDER-type roots as well as the different kinds of readings that *again* generates without the need of stipulating *ad hoc* ontological-type classifications of roots.

5. Conclusion

In the present paper, I have proposed a root-sensitive approach to event structure which has been argued to better capture the syntactic distribution of certain classes of roots. In particular, I have

laid out an approach to argument structure whereby the semantics of roots heavily bears on the grammatical properties of the surface verbs. To make my case, I have focused on result verbs and shown that they enjoy a certain degree of verbal elasticity, contra what one would expect under Rappaport Hovav and Levin's (1998, 2010) and Alexiadou et al.'s (2015) approaches. Yet, I have shown that there are cases of lack of verbal elasticity, contra what FD approaches predict, e.g., Borer (2005, 2013); Mateu and Acedo-Matellán (2012); Acedo-Matellán and Mateu (2014). In this respect, I have proposed that if certain classes of roots introduce structural components of meaning, then a natural explanation follows. Namely, the semantics of roots must be then compatible with the semantics of the event structure. Thus, roots denoting simple states with no eventive properties are predicted not to be associated with the event structure as modifiers, but always as complements. In contrast, roots denoting states that need to be caused are predicted to be able to be associated with the event structure as modifiers due to their eventive properties. Cases of ungrammaticality thus result from clashes between the semantics of roots and the semantics of the event structure, as in the spirit of Beavers and Koontz-Garboden's (2020) *Root-determined Argument Realization hypothesis*.

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