Change of State Verbs and the Semantics of Roots

Andrew Koontz-Garboden and John Beavers

1. Introduction: Root and template in lexical semantics

On all theories of event structure, whether lexicalist (e.g. Pinker 1989; Levin & Rappaport Hovav 1995), constructionalist (e.g. Goldberg 1995; Croft 2001), or syntactic (e.g. Hale & Keyser 2002; Borer 2005; Ramchand 2008) verb meanings decompose into a **template** defining the temporal and causal structure of the event described and an idiosyncratic **root** filling in real world details about the event. Much recent work has it that templatic meaning is introduced in the syntax, by functional heads, with the idiosyncratic meaning introduced by a morphological root.[1] For example, change of state verbs like *flatten* and *crack*, as schematized in (1), share a lexical entailment of change, which is widely assumed to be introduced templatically, and by implication in much work in the syntax, by a functional head with entailments of change. The verbs differ, on the other hand, in the name of the state, represented by the root $\sqrt{\text{flat}}$ in (1a) and $\sqrt{\text{cracked}}$ in (1b).

(1) a. Kim flattened a rug $\approx$ [$_{v\text{P}}$ Kim [$_{v'}$ v_{cause} [$_{v\text{P}}$ a rug [$_{v'}$ v_{become} $\sqrt{\text{flat}}$]]]]
b. Kim cracked a vase $\approx$ [$_{v\text{P}}$ Kim [$_{v'}$ v_{cause} [$_{v\text{P}}$ a vase [$_{v'}$ v_{become} $\sqrt{\text{cracked}}$]]]]

While much work in the literature has focused on the nature of the template, and the kinds of meanings that templates introduce, much less has focused on the kinds of meanings roots introduce, and in particular, whether there is any overlap between the kinds of meanings that templates introduce and those that roots introduce. To state the question differently, in terms due to Embick (2009) (but see also Arad 2005; Dunbar & Wellwood 2016), we consider whether lexical entailments are "bifurcated", which is to say, whether there are two and only two non-overlapping classes of meaning, divided according to how they can be introduced in event structure. Ongoing work based on verbs entailing both manner and result (Beavers & Koontz-Garboden, 2012, in prep), ditransitive verbs of ballistic motion (Beavers & Koontz-Garboden in prep, 2017), and change of state verbs and their derivationally related forms, which we discuss in this paper, provides clear evidence that this is not the case. Rather, templatic meanings can indeed be introduced by roots, with grammatical consequences.

Our core observation is that while entailments of change are introduced by the roots of Levin's (1993) *crack*, *cook*, and *kill* verb classes (hence "*crack*-type") in (2), they are not by the roots of changes into Dixon's (1982) "property concept" states, i.e., Levin's deadjectival classes (hence *flat*-type) in (3).

(2) *crack*-type COS verbs
a. Levin's (1993:241) *break* verbs: break, chip, crack, crash, crush, fracture, rip, shatter, smash, snap, splinter, split, tear
b. Levin's cooking verbs (Levin, 1993:243): bake, barbecue, blanch, boil, braise, broil, charbroil, charcoal-broil, coddle, cook, crisp, deepfry, fry, grill, hardboil, poach, ...
c. Verbs of killing (Levin 1993:230ff.; Beavers & Koontz-Garboden 2012): crucify, electrocute, drown, hang, guillotine, ...

(3) *flat*-type COS verbs (Levin, 1993:245)
awaken, brighten, broaden, cheapen, coarsen, dampen, darken, deepen, fatten, flatten, freshen, gladden, harden, hasten, heighten, lengthen, lessen, lighten, loosen, moisten, neaten, quicken,

* Andrew Koontz-Garboden, The University of Manchester, andrewkg@manchester.ac.uk. John Beavers, The University of Texas at Austin, jtbeavers@utexas.edu. This material is based upon work supported by the National Science Foundation under grant no. BCS-1451765.

[1] What we say below applies equally to all theories of event structure, but for clarity and consistency we cast the discussion in syntactic terms. See Beavers & Koontz-Garboden (in prep) for broader discussion across theories.

 Proceedings of the 34th West Coast Conference on Formal Linguistics, ed. Aaron Kaplan et al., 347-354. Somerville, MA: Cascadilla Proceedings Project.

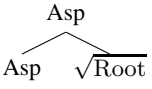
ripen, roughen, sharpen, shorten, sicken, slacken, smarten, soften, stiffen, straighten, strengthen, sweeten, tauten, thicken, tighten, toughen, weaken, widen, ...

We show this based first on arguments from entailment patterns, and then present circumstantial evidence from the morphological typology of the two classes of verbs. We then turn to the analytical consequences of these observations, where our principle claim is that there are at least two classes of stative root, one of which comes endowed with a templatic entailment of change (contrary to the bifurcation thesis). We ultimately claim that this should not be surprising — there are certain kinds of states with meaning rich enough to subsume at least some kinds of templatic meanings. Taken with other work on manner of killing verbs (Beavers & Koontz-Garboden, 2012) and ditransitive verbs of ballistic motion (Beavers & Koontz-Garboden, 2017) suggests that the interplay between root and template meaning is more complicated than has previously been appreciated, and the inventory of root meanings much richer, in ways that are consequential for the syntax/lexical semantics interface.

2. Semantic predictions of bifurcation: Lexical entailment patterns of adjectives

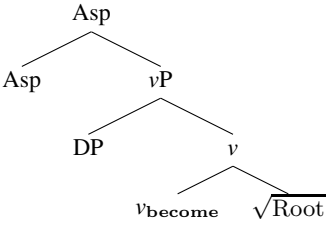
In order to probe the meanings of roots of change of state verbs, we examine adjectival structures, at least some of which are uncontroversially void of any functional structure that might introduce templatic meaning. As a consequence, we can be certain that whatever lexical entailments such adjectives introduce must come from the root. For clarity, we consider Embick's (2004) analysis of the roots of change of state verbs and the adjectives that can be built on these roots. Although other analyses differ in (irrelevant) details, this one is representative of the wide-spread assumptions that are needed in order to make the bifurcation thesis work. The point of departure is two adjectival structures. The first we call "basic states". These involve a stative (precategorial) root merging directly with adjectiving morphology, called Asp in Embick's theory, which adds no templatic meaning to the structure.

(4) Basic states (aka adjectives, statives, etc.) (Embick, 2004:363)



Basic states contrast with result states, adjectives that are derived from verbs, as in (5), and which include the little *v* functional head introducing change of state entailments (which Embick calls FIENT, but which we label v_{become}; Asp in (4) and (5) are potentially different for Embick, though in ways irrelevant here).

(5) Result states (Embick, 2004:367)



All roots of change of state verbs are purely stative (i.e. lack any entailment of change) on any analysis assuming bifurcation, and only acquire an entailment of change through merger with $v_{\mathbf{become}}$. Nothing prevents the roots of all change of state verbs from appearing in both adjectival structures, which means that roots of all change of state verbs should be seen in structures both with and without change entailments. With *flat*-type roots we can see morphologically that they are, in the form of the contrast between *flat*, which realizes (4), with a null exponent for the Asp head, and *flattened*, which realizes (5), with an overt *–ed* exponent for the Asp head. With *crack* roots, conversely, we see no contrast; according to Embick (2004:358), a form like *cracked* realizes both (4) or (5), with *–ed* being the realization of Asp in both structures, and the templatic heads in (5) simply having no phonological realization (by contrast with the situation with *flat*-type roots, where $v_{\mathbf{become}}$ is realized as *–en*).

With that as background, we now consider three predictions about entailment behavior that a bifurcated analysis gives rise to in the domain of change of state verbs. First, morphologically simple adjectives (e.g. *flat*) will not entail a prior change, since they have no $v_{\mathbf{become}}$ as part of their structure. This is clearly borne out, as seen in (6), which show that the states described by such adjectives can be asserted to hold of an individual at the same time that it can be denied, without giving rise to contradiction, that this state arose through some change.

(6) a. The red dirt has never been reddened.
b. The long river has never been lengthened.
c. The bright photo has never been brightened.

A second correct prediction is that denial of such an entailment with the same roots in the deverbal structure, does lead to contradiction, as shown in (7):

(7) a. #The reddened dirt has never been reddened.
b. #The lengthened river has never been lengthened.
c. #The brightened photo has never been brightened.

A final prediction of the bifurcated analysis is that adjectives based on *crack*-type roots, like *shattered*, *dead*, *cooked*, etc., since they realize both (4) and (5), will not entail a prior change, since in any particular context, the adjective could be realizing (4), which lacks $v_{\mathbf{become}}$. It is therefore predicted under bifurcation to lack any entailment of change. This prediction is not borne out — such adjectives do entail a change of the kind named by the verb they are derivationally related to (Koontz-Garboden 2005, 2010; Deo et al. 2011), as shown in (8).

(8) a. #The shattered vase has never been shattered.
b. #The dead man never died.
c. #The cooked chicken has never been cooked.

Notwithstanding sharp judgements like those in (8), there do exist what Nedjalkov & Jaxontov (1988) call "derived statives" — deverbal adjectives that fail to entail that there was any *temporal* change giving rise to the state they describe. On the surface, such examples, as exemplified by (9), where the lines in question do not undergo any temporal event of breaking to come to be in the described state, look like precisely the kinds of data predicted by the bifurcation hypothesis.

(9) . . . this paper provides a guide for writing letters that extend below the baseline. Internal broken lines serve as a reference for writing half-space letters. (Google)

But as Koontz-Garboden (2010) has pointed out, these uses cannot be analyzed as direct merger of a purely stative root (lacking entailments of change) with an adjectivizing head.[2] Firstly, there is clear evidence that they are deverbal, since for each such use, there is a corresponding use of the change of state verb that also fails to entail change in time. Consider (10), which is clearly stative given the non-habitual present tense use of the verb (see e.g. Dowty 1979):

(10) ONE suggestion on ur story, it's hard to read when the line suddenly breaks off and u hav to go down a line in the middle of a sentence, to make it flow easier . . . (Google)

More importantly, it can be shown with straightforward contradiction tests that such uses do entail change, once we recognize that (templatic) change is crucially not exclusively temporal, but can be measured along other dimensions as well, in particular space (Gawron, 2009; Koontz-Garboden, 2010), but even non-temporal and non-spatial domains (Deo et al., 2013). This is clearest with minimal pairs involving roots of deadjectival verb, where it can be seen in a context where some entity changes across space (but not time) that denial that there was a spatial change does not give rise to contradiction with the morphologically simple adjective (11a), while it does with the deverbal adjective (11b):

[2] Although more work is needed, it seems possible that this generalization extends to similar phenomena that have been observed in other languages, e.g. Greek (Alexiadou & Anagnostopoulou, 2008) and Hebrew (Doron, 2009).

(11) Context: I65 between Chicago and Indianapolis, with Lafayette in between the two, where the freeway was built with a portion wider at Lafayette than at the other portions of the freeway.
   a. I65 is wide at Lafayette city center. In fact, it's of the same width for its entire extent.
   b. #I65 is widened at Lafayette city center. In fact it's of the same width for its entire extent.

With *crack*-type roots, there is no morphologically simple adjectival counterpart for contexts like (11a), as already discussed. Crucially, however, denial of an inference of change in spatial change contexts with adjectives derived from *crack*-type roots still leads to contradiction, showing that they entail change, even if not temporal. To see this, consider the "broken line" example from (9), in a context where gaps in the line are labelled, as in (12). Crucially, *broken* can be asserted of portions of the broken line that are preceded by other portions of line, i.e. of portions that are previously connected. Thus (12a) is acceptable in this context, given that spatially prior to point Y, there is a portion of line that can undergo a breaking. If we consider a portion of line at which there is no prior connection, however, as is the case for W in (12), assertion that the line is broken at that point is sharply infelicitous, as seen in (12b).

(12) W – X – Y – Z
   a. The line is broken at Y.
   b. #The line is broken at W.

The conclusion is that there is no context in which entailments of change fail to surface with *crack*-type roots. Even derived stative contexts entail that the participant the state holds of underwent some change, though it need not have been a temporal change. And crucially, the verbs that *crack*-type adjectives are derivationally related to have these same uses (see e.g. (10)). This entailment of change (temporal or otherwise) distinguishes *crack*-type roots from *flat*-type roots, which do clearly surface in their morphologically simple form without an entailment of change of any kind — inferences of temporal and atemporal change can be denied with *flat*-type roots in their morphologically simple form without giving rise to contradiction. The fact that *crack*-type roots cannot be disembodied from an entailment of change in any context, while *flat*-type roots can, suggests that the former, by contrast with the latter, have this as part of their root meaning.

3. Morphological predictions of bifurcation: Identity of markedness

The bifurcated treatment of the roots of change of state verbs also predicts that, modulo language-specific morphological accidents, words derived from the roots of all change of state verbs should be identical in morphological complexity. This is because what defines change of state verbs is the presence of the same templatic operators, and these templatic operators should in the general case have the same exponence across roots (subject to morphological irregularities). Thus internal to a single language all intransitive and transitive change of state verbs should be identical in morphological complexity and shape, as should their corresponding adjectives. Here, we deal only with the prediction related to the morphological structure of adjectives (though see Alexiadou & Anagnostopoulou 2004; Koontz-Garboden 2005, 2009a, 2012 for observations on the morphology of change of state verbs).

Contrary to prediction, as seen in (2) and (3) above, adjectives derived from the roots of English change of state verbs are not morphologically homogeneous. While there are two kinds of adjectives derived from *flat*-type roots (morphologically simple and deverbal), from *crack*-type roots there is only one, which superficially looks to be deverbal (and behaves that way semantically; see §2). Any theorist aiming to preserve bifurcation in the face of such data must treat the English situation as essentially a morphological accident (see e.g. Embick 2004:363). Specifically, Embick claims that in English adjectivizing morphology (*–ed* and allomorphs) realizes the Asp head in both (4) and (5) with *crack*-type roots, while with *flat*-type roots Asp is realized differently in the two structures — null in (4), overt in (5). The contrast between the two root types is then an accident of English morphology.

Since morphological accidents are by definition language specific (see discussion and references in Koontz-Garboden To appear), this predicts that the same kind of morphological split between *flat* and *crack*-type roots should not repeat itself in other languages. While a large-scale study testing this claim is ongoing, preliminary data reported by Koontz-Garboden (2012) collected from a convenience set of unrelated languages suggest that it is false, as can be seen from the Eastern Armenian and Ulwa

data in (13a,b), which show that just like English, these languages lack an adjective of the same kind of morphological form as that describing the simple state for *flat*-type roots.

(13) a. (i) Eastern Armenian deadjectival verbs (Megerdoomian, 2002:98)

adjective	non-causative COS	causative COS
layn (wide)	layn.anal (widen)	layn.ats.nel (widen)
čor (dry)	čor.anal (dry)	čor.ats.nel (dry)
metz (big)	metz.anal (grow)	metz.ats.nel (grow, bring up)
arag (fast, quick)	arag.anal (quicken)	arag.ats.nel (accelerate)
čaq (fat)	čaq.anal (become fat)	čaq.ats.nel (fatten)
sev (black)	sev.anal (blacken)	sev.ats.nel (blacken, darken)

(ii) Eastern Armenian *break*-type verbs (Megerdoomian, 2002:98)

adjective	causative COS	non-causative COS
–	k'ot'Rel (break)	k'ot'R.v.el (break)
–	epel (cook)	ep.v.el (cook)
–	poxel (change)	pox.v.el (change)
–	xort'ak'el (sink, drown)	xort'ak'.v.el (sink, drown)

b. (i) Ulwa "deadjectival" verbs (Koontz-Garboden 2012; fieldnotes)

state	non-causative COS	causative COS
auh– 'fat'	auh-ta– 'fatten'	auh-ta– 'fatten'
pau– 'red'	pau-ta– 'redden'	pau-ta–'redden'
yam– 'good'	yam-pa– 'become better'	?
dut– 'bad'	dut-ta– 'get worse'	?

(ii) Ulwa *break*-type verbs (Koontz-Garboden 2009b)

state	non-causative COS	causative COS
∗	bah-wa– 'break (intrans)'	bah-ta– 'break (trans)'
∗	lah-wa– 'boil (intrans)'	lah-ta– 'boil (trans)'
∗	birh-da– 'tear (intrans)'	birh-pa– 'tear (trans)'
∗	bis-da– 'rip (intrans)'	bis-pa– 'rip (trans)'

Similar contrasts appear to hold in Pima (Smith, 2006:3), Tongan (Koontz-Garboden, 2005) and O'odham (Hale & Keyser, 1998:92). Contrary to the prediction of bifurcation, then, there seems to be a systematic contrast between *flat*-type roots and *crack*-type roots in that state-denoting words based on *crack*-type roots do not seem to exist in the same morphological forms that those based on *flat*-type roots do. In short, the bifurcated analysis misses a morphological generalization. It predicts that any difference in the morphological shape of state-denoting words derived from *flat*-type roots and *crack*-type roots is accidental. The crosslinguistic repetition of the pattern suggests, however, that it is not.

4. Analysis

Above we examined semantic and morphological predictions of bifurcation for change of state verbs, and observed unpredicted contrasts. First, *crack*-type roots are never disembodied from an entailment of change; *flat*-type roots can be. Second, *crack*- and *flat*-type roots contrast in the morphological contexts in which they can appear. We claim that this is because *crack*-type roots come with an entailment of change, while *flat*-type roots do not, as in the contrasting denotations in (14).

(14) a. $[\![\sqrt{\text{flat}}]\!] = \lambda x \lambda s[flat'(x,s)]$
b. $[\![\sqrt{\text{crack}}]\!] = \lambda x \lambda s[has.fissure'(x,s) \wedge \exists e'[become'(e',s)]]$

Defining v_{become} as in (15a) and combining it with (14) derives the inchoative predicates in (15b,c).

(15) a. $[\![v_{become}]\!] = \lambda P \lambda x \lambda e \exists s[become'(e,s) \wedge P(x,s)]$
b. $[\![v_{become}\ \sqrt{\text{flat}}]\!] = \lambda x \lambda e \exists s[become'(e,s) \wedge flat'(x,s)]$
c. $[\![v_{become}\ \sqrt{\text{crack}}]\!] = \lambda x \lambda e \exists s[become'(e,s) \wedge has.fissure'(x,s) \wedge \exists e'[become'(e',s)]]$

Concerning the morphological contrast between root classes, on the proposed analysis we capture this with the assumption that purely stative meanings are unmarked as adjectives but marked as verbs, while roots with change in their meaning are unmarked as verbs but marked as adjectives (in an iconic way reminiscent of Haspelmath 1993). If one strictly assumes that all lexical decomposition is syntactic as assumed above, then this morphological contrast might be formally understood as root-conditioned allomorphy of adjectivalizing and verbalizing heads (null if the root has the appropriate unmarked reading and marked otherwise) or a requirement that *crack*-type roots lack Spell-Outs when combined solely with adjectivalizing heads and thus must always combine with a v_{become} first, thereby making all adjectives with *crack*-type roots deverbal.[3] Alternatively, if one were to allow that not all word formation is syntactic, then a simpler alternative is simply that what we called *crack*-type roots above are actually lexicalized directly as verbs, and thus any adjective based on them must be deverbal by definition.

Semantically, the proposed analysis captures the contrast between the two classes by encoding it into the root. Truth conditionally, (15b,c) are identical save for the final state. But in the case of *crack*-type roots the root itself lexically entails the existence of the change independent of v_{become}.[4] Such an entailment is only found with *flat*-type roots, by contrast, on composition with v_{become}. Such an analysis makes two key semantic predictions. Firstly, it predicts that there can be no adjective form of a *crack*-root lacking the entailment of change. By contrast, there can be for a *flat*-type root. This prediction of contrasting entailments is borne out by the data already discussed in §2.

A second prediction of the proposed analysis is that we should find contrasts in behavior under restitutive *again* modification, which has been analyzed as entailing modification of the root itself (see Beavers & Koontz-Garboden 2012:355ff. for discussion and references), as opposed to the whole event structure (the repetitive reading). This is schematized for (16a) in (16b) for restitutive modification and (16c) for repetitive modification (to illustrate the relevant contrast):

(16) a. Kim flattened a rug again.
b. $[_{vP}$ Kim $[_{v'}\ v_{\text{cause}}\ [_{vP}$ a rug $[_{v'}\ v_{become}\ [_{RtP'}\ again\ \sqrt{\text{flat}}\ ]\ ]\ ]\ ]\ ]$
c. $[_{vP}\ again\ [_{vP}$ Kim $[_{v'}\ v_{\text{cause}}\ [_{vP}$ a rug $[_{v'}\ v_{become}\ \sqrt{\text{flat}}\ ]\ ]\ ]\ ]\ ]$

If it is true, as we claim, that *crack*-type roots have an entailment of change as part of their root meaning, then even with the low restitutive attachment (like (16b)), there should still be an entailment of change under the scope of *again*, by contrast with *flat*-type roots, for which there should not be. In other words, *crack*-type roots should disallow restitutive readings, even on restitutive attachment. Precisely this state of affairs has been observed by Rappaport Hovav (2010), who shows that while a sentence like (17a) with a *flat*-type root can be true even if there has been only one event of opening, with *crack*-type roots like (17b,c), the sentences are *not* true if there has only been a single thawing or melting.[5]

(17) *flat* and *crack* roots contrast in ability to have restitutive readings (Rappaport Hovav, 2010:7)
a. John opened the door again. (only one event of opening necessarily presupposed)
b. John thawed the meat again (necessarily two 'defrostings')
c. John melted the soup again (necessarily two 'defrostings')

5. An alternative and its problems

The analysis of the contrasts between change of state verbs we have proposed above breaks with bifurcation, in that it puts an entailment in *crack*-type roots which is elsewhere known to be introduced templatically. Embick (2009) considers an alternative, which would preserve bifurcation. On his proposal, *crack*-type roots would have a fundamentally different syntactic and semantic status than

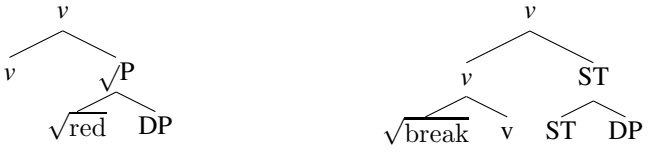
[3] See Pross 2016 for a related argument from the domain of German participial morphology. Something similar would need to be said about the morphological asymmetry in the change of state verbs themselves. For more detailed discussion in the context of a broader landscape of analytical options see Beavers & Koontz-Garboden (in prep).

[4] It is not problematic that v_{become} and $\sqrt{\text{crack}}$ both introduce an entailment of change; since they both introduce this meaning and it is conjoined together it is truth-conditionally equivalent to it being introduced just once.

[5] Beavers & Koontz-Garboden (2012:358) make similar observations about manner of killing verbs in that there is no reading with modifiers like *again* that does not entail manner of an argument, suggesting that these roots violate bifurcation in a different way, in entailing not only change, but also a cause bringing it about.

they do on the traditional analysis. Rather than being state-denoting, and having the syntax expected of a state denoting root, as in (18a) for *flat*-type roots, *crack*-type roots have a manner-type meaning, and occur in the position of manner modifiers, i.e. appearing as the sister of *v*, as in (18b).

(18) a. *flat*-type roots (Embick 2009:6) b. *crack*-type roots (Embick 2009: 17)



The idea embodied by (18) is that $\sqrt{\text{break}}$ denotes a predicate of events (composing with little-v by predicate modification) and takes an unspecified state as an argument. In this way, it has a denotation on a par with the roots of manner verbs like *pound*. Embick's proposal is made absent a theory of what exactly manner is semantically. However, Beavers & Koontz-Garboden (2012) develop diagnostics for manner based on Rappaport Hovav (2008) and Rappaport Hovav and Levin's (2010) idea that manner is non-scalar change. Beavers & Koontz-Garboden (in prep) apply these diagnostics to *crack*-type roots and show quite clearly that they do not have manner entailments, contrary to the prediction of such an analysis. In short, we believe that the received wisdom that the roots of change of state verbs are state-denoting is correct (contrary to the claim of Embick 2009). Rather, bifurcation simply does not hold, and in the specific domain of the roots of change of state verbs, the claim that no root entails that the states described by it are brought about by a change is false — while *flat* roots do not, *crack* roots do.

6. Consequences and concluding remarks

In this paper we have examined the nature of root and template meaning, and where exactly in an event structure the two kinds of meaning can be introduced. A strong implicit or explicit hypothesis in much recent literature has it that any lexical entailments that can be introduced templatically are only ever so introduced, with roots the source solely of idiosyncratic kinds of lexical entailments that primarily just name specific actions and states. The bifurcation hypothesis predicts a range of homogeneous morphological and semantic behavior in the domain of change of state verbs, which we have shown not to be borne out by the facts. There turn out to be at least two distinct classes of roots of change of state verb, so far as morphological and semantic behavior are concerned. *Crack*-type roots introduce not only entailments about the nature of the state, but also an entailment of change itself. Such roots contrast with *flat*-type roots, which do lack change entailments (consistent with bifurcation). This semantic contrast carries over to morphology, where we find that the former type of root is not attested in the same morphological forms as the latter, and this failure to find these roots in the same morphological environments seems to be cross-linguistically systematic rather than accidental to a single language.

But *why* should different stative roots differ in this way? We suggest it has to do with the nature of different kinds of states: while certain states may exist *a priori* of an event leading to them, others only arise due to some event. Roots that entail such states will thus necessarily also entail change. More broadly, we suspect that there are other root classes with templatic entailments; some root meanings presuppose/subsume entailments that are only sometimes introduced templatically. Such is the case, for example, with the roots of manner of killing verbs and entailments of causation (Beavers & Koontz-Garboden, 2012) and the roots of ditransitive verbs of caused possession, some of which have entailments of possession as part of the root meaning (Beavers & Koontz-Garboden, 2017). In short, while there are clearly differences between root and template meaning, there are also certain root meanings which subsume certain templatic meanings. Understanding these divisions, and their consequences for the syntax/semantics interface, is an important issue for future research into the nature of argument structure.

References

Alexiadou, Artemis & Elena Anagnostopoulou (2004). Voice morphology in the causative-inchoative alternation: Evidence for a non-unified structural analysis of unaccusatives. Alexiadou, Artemis, Elena Anagnostopoulou & Martin Everaert (eds.), *The Unaccusativity Puzzle*, Oxford University Press, Oxford, 114–136.

Alexiadou, Artemis & Elena Anagnostopoulou (2008). Structuring participles. Chang, Charles B. & Hannah J.

Haynie (eds.), *Proceedings of the 26th West Coast Conference on Formal Linguistics*, Cascadilla Proceedings Project, Somerville, MA, 33–41.
Arad, Maya (2005). *Roots and Patterns*. Springer, Dordrecht.
Beavers, John & Andrew Koontz-Garboden (2012). Manner and result in the roots of verbal meaning. *Linguistic Inquiry* 43:3, 331–369.
Beavers, John & Andrew Koontz-Garboden (In prep). The meaning of verbal roots and the roots of verbal meaning. The University of Texas, Austin and The University of Manchester.
Beavers, John & Andrew Koontz-Garboden (2017). The semantic contribution of idiosyncratic roots to ditransitive verbs. Kaplan, Aaron, Abby Kaplan, Miranda McCarvel, and Edward J. Rubin (eds.), *Proceedings of the 34th West Coast Conference on Formal Linguistics*, Cascadilla Proceedings Project, Somerville, MA, this volume.
Borer, Hagit (2005). *The normal course of events*. Oxford University Press, Oxford.
Croft, William (2001). *Radical Construction Grammar*. Oxford University Press, Oxford.
Deo, Ashwini, Itamar Francez & Andrew Koontz-Garboden (2011). The morphosemantics of *–ed*. Paper presented at Dimensions of grammar in honor of Paul Kiparsky. Konstanz, August 3, 2011.
Deo, Ashwini, Itamar Francez & Andrew Koontz-Garboden (2013). From change to value difference in degree achievements. *Proceedings of Semantics and Linguistic Theory 23*, CLC Publications, Ithaca, NY, 97–115.
Dixon, R.M.W. (1982). *Where have all the adjectives gone?* Mouton, The Hague.
Doron, Edit (2009). The interaction of adjectival passive and voice. Handout of talk given at Stanford University, February 17, 2009.
Dowty, David (1979). *Word meaning and Montague grammar*. D. Reidel Publishing, Dordrecht.
Dunbar, Ewan & Alexis Wellwood (2016). Addressing the "two interface" problem: Comparatives and superlatives. *Glossa* 1:1, 1–29.
Embick, David (2004). On the structure of resultative participles in English. *Linguistic Inquiry* 35:3, 355–392.
Embick, David (2009). Roots, states, stative passives. Handout of talk presented at Roots, Stuttgart, June 11, 2009.
Gawron, Mark (2009). The lexical semantics of extent verbs. San Diego State University, January 31, 2009.
Goldberg, Adele (1995). *Constructions*. University of Chicago Press, Chicago.
Hale, Kenneth L. & Samuel Jay Keyser (1998). The basic elements of argument structure. *Papers from the UPenn/MIT Roundtable on Argument Structure and Aspect*, MITWPL, vol. 32, 73–118.
Hale, Kenneth L. & Samuel Jay Keyser (2002). *Prolegomenon to a Theory of Argument Structure*. MIT Press, Cambridge, MA.
Haspelmath, Martin (1993). More on the typology of inchoative/causative verb alternations. Comrie, Bernard & Maria Polinsky (eds.), *Causatives and transitivity*, John Benjamins, Amsterdam, 87–120.
Koontz-Garboden, Andrew (2005). On the typology of state/change of state alternations. *Yearbook of Morphology* 2005, 83–117.
Koontz-Garboden, Andrew (2009a). Anticausativization. *Natural Language and Linguistic Theory* 27, 77–138.
Koontz-Garboden, Andrew (2009b). Ulwa verb class morphology. *International Journal of American Linguistics* 75:4, 453–512.
Koontz-Garboden, Andrew (2010). The lexical semantics of derived statives. *Linguistics and Philosophy* 33, 285–324.
Koontz-Garboden, Andrew (2012). The states in changes of state. *Proceedings of the 32nd annual meeting of BLS*, BLS, Berkeley, 515–528.
Koontz-Garboden, Andrew (To appear). Thoughts on diagnosing morphomicity: A case study from Ulwa. Luís, Ana & Ricardo Bermúdez-Otero (eds.), *The morphome debate*, Oxford University Press, Oxford.
Levin, Beth (1993). *English verb classes and alternations*. University of Chicago Press, Chicago, IL.
Levin, Beth & Malka Rappaport Hovav (1995). *Unaccusativity*. MIT Press, Cambridge, MA.
Megerdoomian, Karine (2002). *Beyond words and phrases*. Ph.D. thesis, USC, Los Angeles, CA.
Nedjalkov, Vladimir P. & Sergej Je. Jaxontov (1988). The typology of resultative constructions. Nedjalkov, Vladimir P. (ed.), *Typology of resultative constructions*, John Benjamins, Amsterdam, 3–62.
Pinker, Steven (1989). *Learnability and cognition*. MIT Press, Cambridge, MA.
Pross, Tillmann (2016). What about word meaning if syntax is the only generative component of languages? Talk given at UT Austin, May 19.
Ramchand, Gillian Catriona (2008). *Verb meaning and the lexicon*. Cambridge University Press, Cambridge.
Rappaport Hovav, Malka (2008). Lexicalized meaning and the internal structure of events. Rothstein, Susan (ed.), *Theoretical and Crosslinguistic Approaches to the Semantics of Aspect*, John Benjamins, Amsterdam.
Rappaport Hovav, Malka (2010). Building scalar changes. The Hebrew University of Jerusalem.
Rappaport Hovav, Malka & Beth Levin (2010). Reflections on manner/result complementarity. Doron, Edit, Malka Rappaport Hovav & Ivy Sichel (eds.), *Syntax, Lexical Semantics, and Event Structure*, Oxford University Press, Oxford, 21–38.
Smith, Marcus (2006). Canalization of causative derivations. Paper at 2006 LSA, Albuquerque, New Mexico.

Proceedings of the 34th West Coast Conference on Formal Linguistics

edited by Aaron Kaplan, Abby Kaplan, Miranda K. McCarvel, and Edward J. Rubin

Cascadilla Proceedings Project Somerville, MA 2017

ISBN 978-1-57473-471-3 library binding

Ordering information

Orders for the library binding edition are handled by Cascadilla Press.
To place an order, go to www.lingref.com or contact:

Cascadilla Press, P.O. Box 440355, Somerville, MA 02144, USA
phone: 1-617-776-2370, fax: 1-617-776-2271, sales@cascadilla.com

Web access and citation information

This entire proceedings can also be viewed on the web at www.lingref.com. Each paper has a unique document # which can be added to citations to facilitate access. The document # should not replace the full citation.

This paper can be cited as:

Koontz-Garboden, Andrew and John Beavers. 2017. Change of State Verbs and the Semantics of Roots.
In *Proceedings of the 34th West Coast Conference on Formal Linguistics*, ed. Aaron Kaplan et al., 347-354.
Somerville, MA: Cascadilla Proceedings Project. www.lingref.com, document #3329.