Change-of-State in the Roots of Verbs: A Typological Study

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Event structural theories (e.g. Dowty 1979; Rappaport Hovav and Levin 1998) assume verb meanings decompose into an event template defining the event's broad temporal contours and an idiosyncratic root filling in real world details for a given verb. For example, on syntactic implementations of event structures (e.g. Harley 2012) a surface inchoative change-of-state verb consists underlyingly of a state-denoting idiosyncratic morphological root and a functional head (e.g. *v*) introducing entailments of change (e.g. those of Dowty's BECOME operator):

(1) a. The road reddened. $[_{vP}$ The road $[_{v'}\ v_{\text{become}}\ \sqrt{\text{red}}\ ]\ ]$
b. The road cracked. $[_{vP}$ The road $[_{v'}\ v_{\text{become}}\ \sqrt{\text{cracked}}\ ]\ ]$

A widespread assumption across most if not all event structural approaches is that templatic entailments such as entailments of change are only introduced by the event template, e.g. the functional heads in (1), and never by the roots (cf. Embick's 2009 "Bifurcation Thesis"; see also Arad 2005; Dunbar and Wellwood 2016). In other words, certain types of meanings come from the templatic context a root occurs in and never from the root itself. In this talk I argue against the Bifurcation Thesis by comparing the roots of Levin's (1993) breaking and cooking change-of-state verbs (among others; "*crack* roots") and deadjectival change-of-state verbs ("*red* roots"). We claim that the former class of roots entail change independent of the event templatic context they occur in, and furthermore that this entailment of change carries concomitant grammatical effects in terms of what lexical categories the root can be used in.

First, under Bifurcation all change-of-state event structures are built around a stative root that should, in principle, also form a simple stative term (e.g. a simple adjective in English; Embick 2004). Thus, English has the simple adjective *red* in addition to verbal *redden* and deverbal adjective *reddened*, a paradigm expected of all roots, modulo lexical idiosyncrasy. In an ongoing cross-linguistic study, we are collecting paradigms for 53 *red* roots (Dixon's dimension, value, color, physical property, speed, human propensity, and age classes) and 42 *crack* roots (Levin's entity specific change, cooking, calibrated change, bending, breaking, directed motion, killing, and destroying classes) in a balanced sample of 87 languages largely drawn from the WALS-100 list. Preliminary data for 73 of the languages suggest a striking difference: while *red* roots overwhelmingly have simple stative forms, *crack* roots lack them (e.g. English has deverbal *cracked* but no corresponding simple adjective). This is a statistically significant result both on a *t*-test on the proportion of simple statives for *red* vs. *cracked* roots ($p < 0.001$) and on a one-way ANOVA across all subclasses ($p < 0.001$). Thus the two root classes differ in whether they have simple stative forms.

Additionally, a semantic judgment study of three unrelated languages from our sample (English, Kinyarwanda, and Kakataibo) further supports distinguishing *red* and *crack* roots. Under Bifurcation, a change-of-state verb root appearing without v_{become} should not entail change. Stative predicate adjective templates do not require v_{become} (Embick 2004), yet while simple adjectives from English *red* roots do not entail change, adjectives from *crack* roots are superficially deverbal and categorically do entail change (even on derived stative uses like *the road is widened ahead* à la

Koontz-Garboden 2010, which I also argue in this talk entail change, albeit along a non-temporal dimension). *Crack* roots therefore pattern like deverbal *red* adjectives:

(2) a. The dirt is red, but never reddened.
b. #The glass is cracked/reddened, but never cracked/reddened.

We also give *again*-modification data (Dowty 1979) that further supports this point. All three languages show the same basic patterns (albeit differing in certain language-specific particulars).

Thus, *crack* roots lack simple statives and always give rise to change entailments. Contra Bifurcation, we propose that *crack* roots must therefore themselves entail change, unlike *red* roots, explaining semantic facts like those illustrated in (2). Furthermore, stativizing functional heads in the presence of entailments of change are often independently overtly marked across languages (e.g. in deverbal adjectives), explaining the morphological fact that *crack* roots tend to lack simple stative forms even if they do have marked result stative forms. Finally, that this distinction exists at all is explainable on simple conceptual grounds: while certain states may exist *a priori* of any event leading to them, in principle some states may only arise due to a specific event. Roots that describe such states as part of their meaning will therefore necessarily also have change as a part of their meaning. Thus the existence of *crack*-type roots is expected, and the data above suggest that languages are sensitive to this distinction.

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