

## Two classes of internally caused change of state verb

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Levin & Rappaport Hovav (1995) (building on Smith 1970, Nedjalkov & Silnitsky 1973, Haspelmath 1993) argue that change of state (COS) verbs fall into two subclasses based on whether the change is externally caused by something other than the undergoer (*break*; ECOS verbs) or whether the undergoer is the cause of its own change (*blossom*; ICOS verbs). This difference has consequences for the morphological shape of the two verb classes (Haspelmath 1993) and for whether they have causative alternants, which ECOS verbs typically do but ICOS verbs do not:

- (1) a. The wound healed/decayed.
- b. Medicine healed/#decayed the wound.

We propose ICOS verbs are semantically and syntactically heterogeneous (building on McKoon and Macfarland 2000, Piñón 2001, and Alexiadou 2014). We suggest their roots entail (internally) caused change-of-state (following Beavers and Koontz-Garboden 2012, 2016 and Koontz-Garboden and Beavers 2016), but differ in agentivity of the undergoer. This results in a division where some are unergative (i.e. intransitive manner verbs) and others unaccusative (i.e. intransitive result verbs). Thus one semantically coherent class results in two separate event structures.

McKoon & Macfarland (2000), Wright (2001), and Alexiadou (2014) showed that some ICOS verbs do have causative alternants. Based on corpus data McKoon and Macfarland (p.837) propose a cline where *tarnish*, *erode*, *corrode*, and *ferment* all appear with transitive uses more often than intransitive while *deteriorate*, *decay*, *bloom*, *blossom*, and *flower* rarely show transitive variants. This in turn aligns with the classes Alexiadou claims do and do not passivize:

- (2) a. The silver was tarnished by long exposure to the air.
- b. The soil was eroded and compacted by those walking on the trace. (Google)
- (3) a. \*The tulip was blossomed in the spring.
- b. \*The cherry tree was flowered.

Semantically, *tarnish* and *blossom* verbs differ in whether their subjects pattern as canonical patients vs. canonical agents (Piñón 2001) on standard patient and agent tests (Cruse 1973):

- (4) a. ?What the batteries did was corrode. b. What happened to the batteries was they corroded.
- (5) a. What the roses did was blossom. b. ?What happened to the roses was they blossomed.

However, there are many ways in which all ICOS verbs pattern together, making them a coherent semantic class. All ICOS verbs entail change-of-state, e.g. it cannot be denied:

- (6) #The roses blossomed/The batteries corroded, but nothing is different about them.

Also, *again* has repetitive but not restitutive readings, even in contexts where the state held before:

- (7) a. [ John forged a pipe that has holes, cracks, and an unevenness thickness that mimics the results of corrosion. He then reinforces it, after which it gets eaten away by chemicals. ]  
    # The metal pipe corroded again.
- b. [ Engineers build a river bank that allows water to flow through as though it underwent erosion. They then reinforce it to hold water as normal, and but it erodes. ]  
    # The bank eroded again.
- c. [ A roofer builds a shingle with cracks, rough edges, and soft parts as though it had decayed from leaf and water coverage. He installs some on a roof, then reinforces them to function like normal shingles. Leaves and water then cause them to have damage. ]  
    # The shingles decayed/deteriorated again.

For other ICOS verbs it is impossible to even construct a plausible prior state (e.g. by definition *blossom* describes biological properties of plants that arise through a process of maturation).

Adopting an event structural analysis of verb meaning whereby a verb’s meaning consists of an event template built of basic eventive elements naming changes and actions (e.g. *v* heads) and an idiosyncratic root filling in real world events and states (e.g. idiosyncratic morphological roots), we suggest a natural explanation of this puzzling set of properties arises from the theory of root meaning of Beavers and Koontz-Garboden (2012, 2016) and Koontz-Garboden and Beavers (2016). They propose that in addition to roots that entail basic state meanings (e.g. in unaccusatives like *flatten*) and basic event meanings (e.g. in unergatives like *smile*) roots can also entail complex eventive meanings like caused change-of-state, thus even subsuming the meanings of event templates. We claim that among ICOS verbs the roots all entail caused change-of-state, but the *bloom*-type act as manner modifiers and thus form unergative verbs despite entailing change-of-state while the *erode*-type act as state-naming and thus form unaccusative verbs despite entailing caused change:

- (8) a. [<sub>vP</sub> The flower [<sub>v'</sub> √BLOOM *v*<sub>act</sub> ] ]  
 b. [<sub>vP</sub> The bank [<sub>v'</sub> *v*<sub>become</sub> √ERODE ] ]

The frequency of causative *erode* uses follows since unaccusative verbs typically have causative variants. The rarity of causative *bloom* verbs follows since unergatives typically (but not categorically) lack causative variants. Alexiadou argues against treating either class like unergatives since typically when unergatives do have causative variants they take agentive subjects (as per Levin & Rappaport Hovav 1995; see (9a)) but *bloom* verbs largely disallow those as in (9b).

- (9) a. The general/#the storm marched the soldiers to the tents.  
 b. The sun/\*the scientists blossomed the flowers.

However, it is possible to find examples of agentive subjects with such verbs:

- (10) The genus name *Clivia* is after the Duchess of Northumberland, Lady Charlotte Clive, who first cultivated and flowered the type specimen in England. (Google)

We suggest that the relative rarity has to do with the specific types of actions associated with causing events of *bloom* verbs (e.g. chemical or biological immediate causes). The passive data follows from the causative data: the rarity of causative variants leads to even greater rarity of passives since those are derived from transitives, so speakers may largely deem them unacceptable. That restitutive readings are ruled out follows if change-of-state comes from the root, so no attachment of *again* could extract the state independent of the change (Beavers and Koontz-Garboden 2012). Finally, that one class is unergative and one unaccusative explains the agentivity diagnostics, and thus the fact that *blossom* verbs do not pass *What happened to X is Y* is not surprising: Beavers (2011) notes that agentivity entailments of patient subjects degrades this test.

The remaining question is whether agentivity comes from the root or *v*<sub>act</sub>. We suggest it is the root, since even in templates that lack a *v*<sub>act</sub> head, as with nominal variants, agentivity is present:

- (11) A bloom/blossom/flower to capture more rainwater would be useful to this plant.

This suggests final meanings whereby the roots differ in the subject of the intransitive being an actor (the meaning otherwise introduced anyway by *v*<sub>act</sub>) vs. causer (the meaning otherwise introduced by *v*<sub>cause</sub>), despite both entailing change (the meaning otherwise introduced by *v*<sub>cause</sub>):

- (12) a.  $\llbracket \sqrt{\text{BLOOM}} \rrbracket = \lambda x \lambda v \exists e \exists s [ \text{actor}'(x, v) \wedge \text{cause}'(v, e) \wedge \text{become}'(e, s) \wedge \text{bloomed}'(x, s) ]$   
 b.  $\llbracket \sqrt{\text{ERODE}} \rrbracket = \lambda x \lambda s \exists e \exists v [ \text{causer}'(x, v) \wedge \text{cause}'(v, e) \wedge \text{become}'(e, s) \wedge \text{eroded}'(x, s) ]$

The associations of the two root meanings with two different event structures is ultimately a markedness issue: roots entailing change-of-state can in general show up in either place, but those describing single participant events with actorhood entailments may have a more natural affinity for unergative syntax since this is the typical expression of such meanings.