John Beavers, The University of Texas at Austin University of Rochester, 10/11/2023

Scalar meaning in the roots of verbs and adjectives

(Joint work with Andrew Koontz-Garboden, U. Manchester, and Scott Spicer, UT Austin)

1 Introduction

- One of the key questions I mentioned last time are what the basic building blocks of verb meaning are, and how those building blocks are composed into more complex meanings.
- Last week we just focused on the semantics (of change). But an old but still important insight is that there is also *structure* within verbal meanings (Lakoff 1965).
- Specifically, it is often assumed that verb meanings consis

(3) a. The road is wide. ≈ The road has an above standard degree of width.
b. The road widened ≈ The road has increased in its degree of width.

- Scales provide a way to analyze a range of lexical aspectual facts (telicity as per Hay et al. 1999, Kennedy and Levin 2008, Beavers 2011, durativity as per Beavers 2008, 2012a).
- But can you decompose a scale (qua event structures)? On approaches that have, the assumption is that the root is a **measure function** returning a degree (Kennedy 2007); functional heads introduce **comparison** to the **relevant standard** that creates a predicate.

(4) a. The road is wide ≈ [The road is [

- More evidence for this approach comes from sublexical modifiers like *again* (also

#2 Furthermore, result roots lack restitutive readings:

(14) [John lives in a hot region and finds a fruit with brown, fatty edges. He takes it home, trims off the edges, and puts it in the fridge. He later takes it out and fries it.]
#John fried the fruit again. (necessarily two fryings)

∴ An emergent generalization is that result roots are never disassociable from change — when

- This is the “verbal standard”. Kennedy and Levin define the root as a measure of change function returning a degree of increase, defining a a de facto minimal endpoint scale, where:

#4 With a maximal scale and telic reading the default restitutive comparison is to the maximum:

(28) She straightened the rod again in five minutes, #but it never was straight.

- But with open scale roots the comparison could be to a prior degree that isn't the positive standard (cp. deadjectival verbs do not in entail "become Adj"; Kennedy and Levin 2008):

(29) [A road is built too narrow, and somehow gets narrowed even more. Sandy's job is to restore it to its previous width, albeit it's still too narrow.]
Sandy widened the road again in a single day, but it never has been wide.

- Thus the comparison under *again* is to the verbal standard, not the positive standard.

#5 But with adjectives it's clearly the positive standard under *again*:

(30) The road is wide again. ≈ The road is and was above standard width.

- Yet it's the same root in both cases. So the standard *in the root* isn't the verbal or positive standard. It must be something else that can resolve to either.

Roots introduce comparison to some standard, *but not any specific standard*. The actual standard instead comes from the scale, context, and word category.

5 Comparison in Adjectives and Verbs

- Comparative adjectives also have a meaning of open comparison. Could it be that verbs are built from them (cf. Bobaljik 2012)? Evidence from *than* PPs suggest not.

#1 Comparatives express that the absolute property degree of the subject is greater than some standard that of the DP argument of the *than* phrase can express:

(31) The river is wider than the road. ≈

6 Fitting a Scalar Analysis on a Decompositional Approach

- We propose that PC roots are stative predicates that introduce comparison but *not* a specific standard, building on and expanding Beavers and Koontz-Garboden (2020: 35-48).
- In particular, PC roots introduce comparison to a patient/scale-specific standard $\mathbf{d}_x^{\delta}$:

(34) $[\![\sqrt{\text{WIDE}}]\!] = \lambda x \lambda s \exists\ [\mathbf{wide}'(\ \ s) = \ \ \wedge \ \ \geq \mathbf{d}_x^{\text{WIDTH}}]$

- *pos* introduces the positive standard by setting the root-supplied standard equal to the positive standard (where $\mathbf{d}_x^{\delta_P}$ for scalar stative predicate λx is λx's standard $\mathbf{d}_x^{\delta}$):

(35) $[\![pos]\!] = \lambda \mathbf{d} \lambda x \lambda s[\ \ (\ \ s) \wedge \mathbf{d}_x^{\delta_P} = \mathbf{stnd}'_{\mathbf{pos}}(\delta_P)]$

- Applying (35) to *wide*, taking a patient, and $\exists$-binding s produces (36), where the ultimate interpretation depends on how we interpret the positive standard (see e.g. (17)).

(36) $[\![$ [The road is [*pos* [*adj* $\sqrt{\text{WIDE}}$]]] $]\!]$ ("The road is wide")
= $\exists s[\exists\ [\mathbf{wide}'(\mathbf{road}'\ s) = \ \ \wedge \ \ \geq \mathbf{d}_{\mathbf{road}'}^{\text{WIDTH}}] \wedge \mathbf{d}_{\mathbf{road}'}^{\text{WIDTH}} = \mathbf{stnd}'_{\mathbf{pos}}(\text{WIDTH})]$
= $\exists s \exists\ [\mathbf{wide}'(\mathbf{road}'\ s) = \ \ \wedge \ \ \geq \mathbf{stnd}'_{\mathbf{pos}}(\text{WIDTH})]$
"There is a state s

- For verbs, v_{become} ensures there is an event of change at the end of which the theme holds a

≈ "There is an event e in which the road goes from holding some degree d_i of WIDTH below the verbal standard for WIDTH to some degree d_f of WIDTH above the verbal standard, forming a difference of at least $\mathbf{d}_c$ degrees between the two degrees."

- Finally, and crucially, this analysis captures the *again* facts when *again* scopes over the root:

(45) $[\![[\sqrt{\text{WIDE}} \text{ again }]]\!] = \lambda x \lambda e'''[\exists [\mathbf{wide}'(x, e''') = \max \wedge \max \geq d_z^{\text{WIDTH}}] \wedge \exists s'[s' \ll s \wedge \exists [\mathbf{wide}'(x, e'') = \max \wedge \max \geq d_z^{\text{WIDTH}}]]]$

- This ensures the theme now and before held a degree above the root-supplied standard, which *adj* will fill in as the positive standard and v_{become} as the verbal standard.

7 Incrementality in Change of State

- However, a question arises: since v_{become} introduces a change from not being above the standard to being above it, do we need $\neg o(e')$ or anything like it?

- Comparison to standards alone is sufficient to predict some facts about change-of-state verbs. For example, as Kennedy and Levin (2008) note maximal endpoint scalar predicates default to telic readings and open scale predicates to atelic readings:

(46) a. Sally straightened the rod in/(?)for an hour.
b. Sally widened the opening for/?in an hour.

- But as we discussed last time, patient expression can figure into telicity (see Beavers 2012a):

(47) a. Sally straightened rods for/??in an hour.
b. Sally widened openings for/??in an hour.

- Scales and themes also figure into durativity: gradability of scales and/or mereological complexity of themes (at least as conceived in context) are required for durative readings (Beavers 2012a), using ambiguity of *in an hour* modifiers as a test for durativity (Kearns 2000):

(48) a. The drop of soup will cool from 0.1°C in an hour

- We can define o' as introducing incrementality, with the rest of the meaning of v_{become} delimiting the scalar endpoints (where δ_s is the dimension of state s, $\mathbf{S}_s$ the set of degrees of s, and $\mathbf{d}_{\mathbf{x}}^{\delta_s}$ is the degree asserted of some patient on δ in state s):

  (50) for all $s_{\blacktriangleright}$ where is the patient of , $o'(s_{\blacktriangleright})$

9 Scales and Comparison in Causative Heads

- So far, v_{become} introduces comparison between difference values via an open difference variable. It turns out v_{cause} also introduces comparison, albeit of degrees of prototypicality or quality, modelable on a scale following Kennedy and McNally (2010) and Bochnak (2010, 2013). Consider the following context and associated sentence:

  (53) [You and I both have glasses of water; mine is an insulated cup and yours is a regular glass cup. I stick mine in the microwave, and then I stick yours in the microwave one minute later, and they finish microwaving at the same time. When I take both out, mine is cooler than yours because of the insulated cup.]

  a. I heated up my drink more than yours, but your drink didn't heat up more than mine.

  b. I heated up my drink more than yours, but my cup went up by 3°C and yours went up by 4°C.

- This seeming contradiction would only be possible if the causative *heat* introduces a property distinct from the difference value introduced by the inchoative.

- This is the 'goodness' of the heating, e.g. how long or how effective the event is, and *more* is asserting a greater-than ordering between the prototypicality of two events.

10 Root Licensed Degree Modification?

- Our claim so far is that roots introduce basic comparison, while functional heads introduce standards and higher order comparisons, and provide access to various degrees for *than* expression. But is the degree introduced by a root itself ever accessible for expression?

- Resultatives may indicate a possible case of root-licensed degree expression:

  (56) Mary opened the door wide.

- Here *wide* indicates the final degree, which is supposedly in the root meaning (e.g. in (34)).

- The presence or absence of a property reading comes from the

- So while the picture above blurs the distinction between roots and templates, the division is still justified, thus supporting the earliest conclusions of Dowty (1979) of the need for event structures while addressing the lacuna that had left him concerned about their prospects.

13 Acknowledgments

- This material is based upon work supported by the National Science Foundation under grant no. BCS-1451765.

References

Alexiadou, Artemis, Elena Anagnostopoulou, and Florian Schäfer. 2015. *External Arguments in Transitivity Alternations: A Layering Approach*. Oxford: Oxford University Press.

Arad, Maya. 2005. *Roots and Patterns: Hebrew Morpho-Syntax*. Dordrecht: Springer.

Beavers, John. 2008. Scalar complexity and the structure of events. In J. Dölling, T. Heyde-Zybatow, and M. Schäfer, eds.,

Rappaport Hovav, Malka and Beth Levin. 2001. An event structure account of English resultatives. *Language* 77:766–797.