The logical structure of verbs of quantized and non-quantized change

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It has long been known that there are two principal classes of accomplishment verbs, which are sometimes referred to as verbs of quantized and non-quantized change (Hay et al. 1999; Beavers 2013; see also Dowty's (1979: 88-90) degree achievements and Bertinetto & Squartini's (1995) verbs of gradual completion). With verbs of quantized change the progressive does not entail the perfect (cf. 1a), whereas with verbs of non-quantized change it does (cf. 1b).

(1a)   The soldier is dying ≠> the soldier has died.
(1b)   The child is growing => the child has grown.

The verbs exemplified in (1a) are *telic*, in the sense that they entail a specific final goal state (Beavers 2013). The same is true of *die, be born, fall, arrive*, and many verbs of inherently directed motion (Levin 1993). Telic verbs are incompatible with *completely*, which is redundant, and with *not completely*, given that they have a specific final state as one of their entailments.

(2)   The soldier has died #completely / #but not completely.

According to Hay et al. (1999), with verbs of non-quantized change telicity can arise as an implicature, when the adjectival base of a deadjectival verb (e.g., *empty, straighten,* etc.) entails a bounded difference value, which is a measure of the amount to which an argument of the verb changes with respect to a gradable property. The verbs that have this kind of adjectival base test out as telic in accordance with some diagnostics (cf. 3a), although they are also compatible with *completely* and *not completely*.

(3a)   Mary is straightening the antenna ≠> Mary has straightened the antenna.
(3b)   Mary has straightened the antenna completely / but not completely.

Telicity can also arise as an implicature based on a conventional property of the undergoer. This can be the case with deadjectival verbs whose basis does not entail a bounded difference value. These verbs test out as non-telic (4a) and are compatible with *not completely* (4b). The implicature of telicity, in the above sense, can be cancelled (cf. 4b).

(4a)   Mary is shortening the rope => Mary has shortened the rope.
(4b)   Mary has shortened the uniform, but not completely.

We address the question of how these differences in the encoding of scalar change (Rappaport Hovav 2008) ought to be represented in the RRG system of lexical decomposition. Our point of departure is Van Valin's (2005) proposal that the operator BECOME should be broken down into the process operator PROC and the result state operator INGR. This proposal allows RRG to capture the difference between, on the one hand, verbs of scalar change that describe a change with no end result and, on the other, verbs that lexicalise an end result as part of their meaning. This contrast has a transparent morphological manifestation in some languages, for example, Mparntwe Arrernte and Lakhota. A verb that describes a process of

cooling with no lexicalized end result is represented as in (5a), whereas one that describes a telic process of cooling is represented as in (5b).

(5a) PROC **cold'** (x) (see Mparntwe Arrernte *irrernte+irre*) (Van Valin 2005: 44)
(5b) PROC **cold'** (x) & INGR **cold'** (x) (see Mparntwe Arrernte *irrernte+arle+irre*)

The same principle is applied in the representation of active accomplishments put forward in Van Valin (2018). Thus, activity *run*, which does not entail an endpoint, is represented as in (6a), whereas the corresponding active accomplishment is represented as in (6b), which includes the end state of being at a location (z).

(6a) [**do'** (x, [**run'** (x)]) ∧ PROC **cover.path.distance'** (x, (y))]
(6b) [**do'** (x, [**run'** (x)]) ∧ PROC **cover.path.distance'** (x, (y))] & INGR **be-at'** (z, x)

Adopting this system, the class of *die* can be represented as in (7), whereas the representation of *straighten* could in principle vary between the two alternatives in (8a-b), with (8b) including the representation of a final goal state arising from the adjectival base.

(7)   PROC **die'** (x) & INGR **dead'** (x)
(8a) PROC **straight'** (x)
(8b) PROC **straight'** (x) & INGR **straight'** (x)

Our talk addresses some challenges to the analyses in (7)-(8a-b) and proposes a tentative solution. We ask if we should we only break down BECOME into PROC+INGR in the cases illustrated in (5a-b, 6a-b) and if any verbs of scalar change require the operator PROC *alone* in their lexical representation (cf. 5a). Lastly, we address the issue of whether we should differentiate quantized vs. non-quantized change in LS.

We discuss evidence in favour of the breaking down of BECOME into PROC+INGR in the lexical representation of *all* verbs of scalar change. Important evidence is provided by the selection of the perfect auxiliary in Italian. In this language, 'be' is selected with monovalent states, achievements and accomplishments (cf. 9a), whereas 'have' is selected with activities (cf. 9b) (Centineo 1986, Van Valin 1990, Bentley 2006).

(9a) Il   treno   è   salito   (su per la   collina in due ore). (Italian)
      the train   be.3SG gone.up   up for the   hill   in two hours
      'The train went up (the hill in two hours).'
(9b) Il   treno   ha   sobbalzato (per ore).
      the train   have.3SG jolted   for hours
      'The train jolted (for hours).'

Given that monovalent verbs of quantized and non-quantized change select 'be', INGR **pred'** must be in the LS of both types.

(10a) La   bomba   è   scoppiata. [Quantized change] (Italian)
      the bomb   be.3SG exploded
      'The bomb exploded.'
(10b) La   paura   è   cresciuta. [Non-quantized change]
      the fear   be.3SG   grown
      'The fear has grown.'

Given that some verbs of non-quantized change allow activity (process) readings, in which case they select 'have', PROC must be part of their LS.

(11) La frutta ha   marcito   per/*in una settimana. [Process]
      the fruit have.3SG rotted   for in a   week
      'The fruit has rotted / has been rotting for a week.'

Therefore, we put forward the following proposal: the LS in (5a) (cf. 12a) should only be adopted for verbs describing a process and entailing the absence of an end result. The LS in (7) (cf. 12b) should be adopted for verbs of quantized change, where **pred'** (x) represents a lexicalized *specific* final goal state. Instead, we propose the LS in (12c) for the verbs of non-quantized change, where INGR **pred α'** (x) indicates that a final state exists, but the verb does not entail a specific final goal state.

(12a) PROC **pred'** (x) [verbs which only lexicalize the process]
(12b) PROC **pred'** (x) & INGR **pred'** (x) [verbs of quantized change]
(12c) PROC **pred'** (x) & INGR **pred α'** (x) [verbs of non-quantized change]

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