

States and degrees: Additive *again*

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While degree constructions are very well studied in terms of measure phrases, less work has been done on multiplicative factor phrases like *twice as tall* or *three times faster* (Gobeski, 2011), or additive particles like *more* in contexts like *last night I graded 4 papers and this morning I graded 2 more* (Greenberg, 2010; Wellwood, 2015). Here I give an analysis of an apparently novel observation about the use of *again* in several dialects on English that sheds light on additivity. As is well known from literature on *again*'s restorative/repetitive ambiguity, *again* deals with the repetition of eventualities (Von Stechow, 1996; Marantz, 2007). In some dialects, as in (1a), it can have an additive reading meaning *that much on top of the previous amount*. Most commonly used in combination with *half*, as in (1a), this would be $(1 + \frac{1}{2})x$ the standard phrase, but *a third again*, for example would be $(1 + \frac{1}{3})x$. I propose the additive reading of *again* to result from a link between adjectives having state arguments (Parsons, 1990; Kratzer, 2000), and a measure function which extracts the degree from the state. For simplicity, I will focus on the structure with the equative here, as in (1a).

- (1) a. Neville is **half again as tall as Pansy**. (1.5x)
- b. This pile of loot is **half again the size of the last one!** (1.5x)
- c. Neville is **a third again as tall as Pansy**. (1.3x)
- d. I expected it to cost \$20, but it costs **that again!** (\$40 or 2x)

With this *one-and-a-half times* interpretation, *half again* can combine with more structures than just an equative, as seen in (1), and different proportions than *half* as possible. In (2) examples are shown from the Oxford English dictionary, indicating that *again* has the same flexibility in British English as well.

- (2) a. Lent shall be **as long againe** as it was. *Henry VI, by Shakespeare*
- b. Brazil nut trees are emergent species, **half as tall again** as most canopy trees.
Secret Life of Trees, by Colin Tudge

From the data in (1), we can conclude that *half again* must be additive rather than multiplicative, and so *again* cannot work exactly the same as factor phrases. The existing analysis of factor phrases from Gobeski (2011) follows Kennedy's DegP structure and proposes *half* to be $\langle\langle d, et \rangle, \langle d, et \rangle\rangle$, applying to an equative like *as tall*, and setting it equal to a multiple of the degree like *as Pansy*. Applying *again* to this *half* with the same strategy of setting it equal to a different multiple of the degree would be multiplicative. If *half* is $\frac{1}{2}d$, and *half again* d is $1\frac{1}{2}d$, then *again* must convey a multiple of 3 to mathematically reach the correct meaning ($\frac{1}{2}d * 3d = 1\frac{1}{2}d$). In addition to the unintuitive idea that *again* means *three*, this makes the wrong predictions for any use with anything other than *half*, like (1c,d). The degree to which an adjective holds of the state bearer must be constructed by separately accessing the halved degree and the degree of the standard phrase and adding them.

In order to access these degrees separately, I return to *again*, and its traditional dealings with states. Extracting degrees from events to denote run time or spatial distance for example, have been proposed, but via homomorphisms relating the event to a path or individual (Nakanishi, 2007; Kennedy & Levin, 2008). I posit a measure function which applies to a state and returns the degree to which it holds. Within a degree semantics, gradable

adjectives denote a relation between an individual and a degree. If we consider adjectives to have a state argument, then a relation between that state and a degree as well as the state and the individual allows for a stative theory to incorporate gradability in the same way.

Assuming a structure where the factor phrase *half* merges with *as tall* before the standard phrase *as Pansy*, (Gobeski, 2011), I posit *again* is merged before the standard phrase *as Pansy*, as in (4). A denotation for *again* that captures this additivity is in (3), along with a potential translation of Gobeski (2011)’s factor phrase structure within the computation.

$$(3) \quad \begin{aligned} \llbracket \text{again} \rrbracket &= \lambda f_{\langle d, \langle s, t \rangle \rangle} \lambda d \lambda s. \exists s' [f(d)(s') \wedge \\ &\mu(s) = \mu(s') + d] \\ \llbracket \text{half as tall} \rrbracket &= \lambda d \lambda s [\text{tall}(s) \wedge \mu(s) = \\ &\frac{1}{2}d] \\ \llbracket \text{again} \rrbracket (\llbracket \text{half as tall} \rrbracket) (\llbracket \text{as Pansy} \rrbracket) &= \\ \lambda s. \exists s' [\text{tall}(s') \wedge \mu(s') = \frac{1}{2}d_{\text{Pansy}}] \wedge \\ \mu(s) = \mu(s') + d_{\text{Pansy}} \end{aligned} \quad (4) \quad \text{half as tall again as Pansy}$$

In this denotation, *again* calls for a repetition of a state of the same type, here a state of tallness. The *half-as-tall* state exists vacuously, as it has no bearer, and crucially, the overall state of the sentence, must also be of tallness. This is the state which holds of the subject of the sentence. The measure function in *again* applies to the *half-as-tall* state in order to extract the halved degree, which is added to the degree from the standard phrase to create the additive degree that holds of the overall state of the sentence.

Additive *again* does not work in the same fashion as a factor phrase or measure phrase, nor does it contribute only the presupposition of repetition to the truth conditions. A parallel with the usual presuppositional view of *again* is the re-occurrence of a state of the same type. Stepping away from parallels, this denotation provides a view into a new area in the relationship between additivity and states and provides particularly clear evidence for degrees extractable from state arguments. Semantics dealing with states commonly assume adjectives to have state arguments, whereas degree semantics assume gradable adjectives to denote a relation between an individual and a degree. I argue that both are relevant, as this use of *again* supports an argument for a function relating degrees and states.

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