

Telicity across semantic domains: the case of *almost*

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A fascinating aspect of telicity that has occupied semantic research since the early works of M. Krifka, H. Verkuyl and others, is the relations between the nominal and the verbal domains. Recent work has also started to explore other cross-categorical aspects of telicity, notably adjectives (Hay et al. 1999, henceforth *HKL*) and prepositions (Zwarts 2005). The modifier *almost* is especially useful for testing telicity in different semantic domains due to its cross-categorical nature, combined with Dowty's (1979) observation about its ambiguity with telic predicates *vis à vis* atelic predicates.

We show that Dowty's observation does not always hold: some telic prepositions do not exhibit the ambiguity expected with *almost*. Using the analysis in Rotstein and Winter (2004, henceforth *R&W*), we conclude that ambiguity of *almost* in verbal forms is caused by *closure* of the structure it modifies, and not by telicity *per se*. This unified account of *almost* with verbs, prepositions and adjectives is used for generalizing *HKL*'s mapping from scales to temporal structures. Against *HKL*'s claim, and in agreement with Kearns (2005), we show that contextual information only affects open structures, but not closed structures. Based on the *subinterval property* of Bennett and Partee (1978), we provide a characteristic of atelicity, which we call *weak downward monotonicity*. We show that this condition immediately accounts for the correlation between the a/telicity of deadjectival verbs and the closure properties of scales associated with the corresponding adjectives.

Almost and telicity Consider *almost* with a telic predicate, as in *Dan almost drew a circle*. This sentence either means that Dan started to draw a circle and got close to finishing it, or that Dan got close to starting a drawing of a circle but didn't actually start. Rapp and Von Stechow (1999) refer to these interpretations as *scalar* (S) and *counterfactual* (C), respectively. By contrast, Dowty (1979) points out that *almost* with atelic predicates, e.g. *Dan almost pushed a cart*, only leads to the C-interpretation.

Almost and path structure Zwarts (2005) uses examples like *Dan ran around/to the lake in three hours* to characterize prepositions like *around* and *to* as telic (at least in these examples). Unexpectedly, however, the same examples do not easily show C/S ambiguities with *almost*. Consider (1a) below, as opposed to (1b).

- (1) a. Dan almost ran around the lake. b. Dan almost circled the lake.

The prominent interpretation of (1a) is the C-interpretation. By contrast, (1b) clearly shows the C/S ambiguity. Similar contrasts are notable with *to* in languages that have spatial usages for a telic preposition parallel to *until*. Examples are French *jusque* (see Bonami 1997), Dutch *tot* and Hebrew *@ad*. Compare for instance the Hebrew sentences in (2a) and (2b).

- (2) a. dan kim@at rac la'agam. b. dan kim@at rac @ad ha'agam.

Dan almost ran to-the-lake Dan almost ran until the-lake

The preposition *la* ("to-the") in (2a), like the English *to*, strongly prefers the C-interpretation (Dan didn't start running, or ran but not to the lake). By contrast, with *@ad* ("until"), (2b) is ambiguous, and also has the S-interpretation: "Dan ran and almost reached the lake".

Why do prepositions like *to* and *around* interact with *almost* differently than other telic predicates? Our answer is quite simple: the paths that these prepositions describe, although telic, are topologically *open* – they do not contain their endpoint. By contrast, prepositions like *until* or verbs like *circle* describe *closed* paths containing their endpoint. As in *R&W*'s account of *almost* with adjectives, we claim that the scalar semantics of *almost* requires the structure it modifies to be closed. Telicity of verbal structures where *almost* exhibits the S-interpretation only follows from their closure. To establish this claim, we turn to the closure properties of adjectival scale structures, and their relations with telicity of "degree achievement" (DA) verbs.

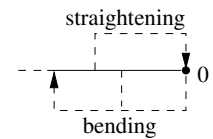
Almost and scale structure Total adjectives (cf. Yoon 1996) like *straight*, *clean* and *dry* describe lack of curvedness, dirt or moisture, and are uniformly acceptable with *almost*. Their antonyms (e.g. *bent*, *dirty*, *moist*) are called *partial*, and describe a non-zero degree of the relevant property. Partial adjectives are felicitous with *almost* only when the context specifies a minimal degree: e.g. *almost dirty* is unacceptable out of the blue, and only ameliorates in contexts specifying some minimal degree of dirtiness. In this respect partial adjectives are like *relative* adjective pairs such as *tall-short* and *expensive-cheap*, whose acceptability with *almost* is also context-dependent. R&W propose three kinds of scale structures: 1. Total scales, with a standard value that is fixed on the zero degree, creating a *closed* interval. 2. Partial scales, where the standard value's default is the zero degree, creating an *open* interval. This default can be overridden by context. 3. Relative scales are like partial scales, but they lack a default standard. Their standard can *only* be contextually specified. R&W account for the distribution of *almost* with adjectives using these structures and a semantics for *almost* that requires a closed interval.

Scale structure and telicity Like HKL, we aim to account for the telicity of DA verbs using the scale structure of the corresponding adjectives. HKL show that without contextual information, total DAs (e.g. *straighten*) are telic whereas partial and relative DAs (e.g. *bend* and *lengthen*) are atelic. Further, without contextual information, total and partial DAs entail their adjective whereas relative DAs don't: witness (3) and (4) as opposed to (5).

(3) Dan straightened/dried the rod/towel \Rightarrow The rod/towel is straight/dry.

(4) Dan bent/moistened the rod/towel \Rightarrow The rod/towel is bent/moist.

(5) Dan lengthened/shortened the rope \nRightarrow The rope is long/short.



Moving on to contextual effects on closure properties, HKL show that relative DAs may become telic when a standard is contextually salient (e.g. *the tailor lengthened my pants in five minutes*). R&W account for a similar effect with relative adjectives: *almost long* ameliorates when a length standard is salient. Similarly for partial DAs and adjectives. However, the opposite does not hold for total scales: there is little context can do to worsen expressions like *almost straight*. Accordingly we argue, against HKL and in agreement with Kearns (2005), that total DAs like *straighten* are univocally telic and entail their adjective as in (3) independently of context.¹ We conclude that context can make open scales closed by fixing the standard, hence the possible telicity of relative and partial DAs. But closure of a scale is context-independent, hence the impossibility of atelicity with total DAs.

We account for these observations using a general mapping from any adjective *A*, possibly with a standard *d*, to the corresponding DA verb *V*: for any theme *x*, *V(x)* denotes a set of intervals \mathcal{J} such that at the end of each $I \in \mathcal{J}$, *x* has a degree of *A*-ness that is acceptable for *A* (relative to *d*, if *d* is given). Consider the figure above. A *straightening* invariably ends with zero curvedness, since this is the only degree for *straight*.² By contrast, with a partial/relative DA like *bend/lengthen*, the endpoint depends on the salient standard. When the context doesn't fix a standard, the contrast (4)-(5) follows from the zero default of partial scales, and the lack of default for relative scales, which allows the process in (5) to end at any point on the scale.

Back to telicity: Telicity properties of DAs follow from a formal observation on the above mapping: the set of intervals in a DA verb *V* is *weakly downward monotone* ($WM\downarrow$) when the scale of the corresponding adjective *A* is open; but *V* is not $WM\downarrow$ when the scale is closed.

¹One piece of evidence for HKL's assumption that total DAs can become atelic comes from the fact that they, like all DAs, accept *for* adverbials. But these are unreliable for testing atelicity: as Dowty (1979) points out, *for* often turns a (telic) accomplishment into an (atelic) activity. Further, HKL's example *I straightened the rope, but not completely* relies on the *completely* adverbial: $\#I$ straightened the rope, but it isn't straight is odd. This contrast, which was also pointed out by Kearns, follows from R&W's distinction (see note 2) between *straight(en)* and *completely straight(en)*.

²R&W argue that less-than-zero degrees are needed for distinguishing *straight* from *completely straight*. This doesn't affect our results, but for sake of exposition, *straight* is here only associated with the zero degree.

Weak downward monotonicity is defined as follows:

Let \mathcal{I} be the (open and closed) intervals over \mathbf{R} . A set $\mathcal{J} \subseteq \mathcal{I}$ is $\mathbf{WM}\downarrow$ iff for every $I \in \mathcal{J}$ there is $I' \in \mathcal{I}$ s.t. I' is properly within³ I , and for every $I'' \in \mathcal{I}$: if $I' \subsetneq I'' \subseteq I$ then $I'' \in \mathcal{J}$.

Weak downward monotonicity is proposed as a necessary and sufficient condition for atelicity of predicates in natural language, under the following hypothesis:

For any natural language predicate P : P is atelic iff the set of intervals it describes is $\mathbf{WM}\downarrow$; otherwise P is telic.

Intuitively, a set of intervals \mathcal{J} is $\mathbf{WM}\downarrow$ if each I in \mathcal{J} can be approximated by proper subintervals of I in \mathcal{J} . For instance, *bending* or *lengthening* intervals can be approximated by similar intervals properly within them. Thus, the respective DAs are $\mathbf{WM}\downarrow$ (hence atelic). By contrast, a *straightening* interval does not have to properly contain any other such interval, and *straighten* is therefore non- $\mathbf{WM}\downarrow$ (hence telic).

The $\mathbf{WM}\downarrow$ characterization mends the “Sorites paradox” (cf. Kennedy 2005) for the subinterval definition of atelicity in Bennett and Partee (1978) – an atelic verb like *walk* does not necessarily require that if I is an interval of walking then every subinterval of I is an interval of walking as well. The $\mathbf{WM}\downarrow$ property does not require that either.⁴

Getting back to prepositions, following Zwarts (2005) and others, directional prepositions like *around* and *to* are described as sets of *paths*: functions from intervals to locations. Assume that *around* is a set of path functions \mathbf{p} from the *half-open* interval $[0, 1)$ to locations. An object x is then said to be in the extension of the predicate *run around the lake* at an interval I iff I is a half open (temporal) interval $[t_0, t_1)$ s.t. x ran at I and the following path \mathbf{p}' is *around the lake*: \mathbf{p}' maps every $i \in [0, 1)$ to the location l of x at time $t_0 + i \cdot (t_1 - t_0)$.

By contrast, an object x is in the extension of the predicate *circled the lake* at an interval I iff I is a *closed* (temporal) interval $[t_0, t_1]$ s.t. x ran at I and the following path \mathbf{p}'' describes a closed circle that surrounds the lake:

\mathbf{p}'' maps every $i \in [0, 1]$ to the location l of x at time $t_0 + i \cdot (t_1 - t_0)$.

Thus, the paths \mathbf{p}' and \mathbf{p}'' both record the change in location of x in the interval of time I , but their topology around the lake is different: \mathbf{p}' is an *open* circle, whereas \mathbf{p}'' is a closed cycle.

It is easy to verify that both sets of intervals generated in this way for the statements *x ran around the lake/circled the lake* are not $\mathbf{WM}\downarrow$, hence both predicates are telic. However, the intervals in the latter case are closed, hence the S-interpretation of *almost* in sentences like (1b), as opposed to (1a).

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³ I' is properly within I iff $\text{supremum}(I') < \text{supremum}(I)$ and $\text{infimum}(I') > \text{infimum}(I)$.

⁴ Note that not any $\mathbf{WM}\downarrow$ set of intervals is required to be a possible set of intervals associated with an atelic predicate in natural language – atelicity in natural language may have stronger implications than what $\mathbf{WM}\downarrow$ requires. Some sort of homogeneity weaker than Bennett and Partee’s subinterval property may be needed on top of the $\mathbf{WM}\downarrow$ requirement. See also Borik (2002) for a relevant proposal following Reinhart (1986).