

Multiple Incremental Themes and Figure/Path Relations

Aspectual properties of dynamic predicates are tied at least partly to the mereological properties of their incremental theme arguments (Verkuyl 1972, Dowty 1991). I examine predicates that appear to have two incremental themes, albeit two incremental themes that are interdependent and mutually constraining. I extend the model of telicity in Krifka (1998) to include three-place thematic relations that capture these interrelationships, and ultimately argue that three-place relations underlie all dynamic predicates, providing a uniform semantics for a wide range of predicates.

Typical incremental themes include patients of creation/consumption verbs, property scales of change-of-state verbs, and paths of motion verbs (Tenny 1992). A crucial property of incremental themes is that quantization/boundedness affects telicity. For example, consumption predicates are telic with definite, specific patients and atelic with bare plural/mass patients, as in (1). Likewise, motion predicates are telic when the path is bounded, but atelic when it is not, as in (2).

- (1) a. Caesar drank two beers in/?for two hours. (quantized patient)
 b. Caesar drank beer for/??in two hours. (non-quantized patient)
- (2) a. The carafe of wine flowed from the jar to the floor in/?for five minutes.(bounded path)
 b. The carafe of wine flowed for/??in five minutes. (unbounded path)

Krifka (1998) derives this from homomorphic θ -relations between the incremental theme and the event. Informally, a predicate is telic if it describe no proper, non-initial, non-final subevent of any event it describes. If the relevant θ -relation maps proper subevents to proper subparts of the incremental theme, the contrasts in (1) and (2) follow. For example, any proper subpart of beer is beer and thus an event of drinking a proper subpart of beer (qua a proper subevent of drinking beer) is an event of drinking beer, predicting (1b) is atelic. However, no proper subpart of two beers is two beers and thus no event of drinking a proper subpart of two beers (qua a proper subevent of drinking two beers) satisfies (1a), predicting (1a) is telic. The relevant homomorphism is an isomorphism between the event and incremental theme (Krifka's Incremental Relation; INC). Similarly, a proper part of a non-specific path is still a path, so an event of flowing along such a subpath is an event of flowing, predicting (2b) is atelic. However, no proper non-initial, non-final subpath from the jar to the floor is a path from the jar to the floor, so no event of flowing along such a subpath satisfies (2a), predicting (2a) is telic. The relevant homomorphism is a function from events to paths that preserves temporal/spatial boundaries and adjacency (Krifka's Movement Relation; MR).

However, it is less often noted (though see Dowty 1979:63, Filip 1999:100-101) that many predicates, including motion predicates (which I focus on here), have two incremental themes as in (3) (cp. (2a)), where a bare plural/mass figure, even with a bounded path, yields a atelicity:

- (3) Wine flowed from the jar to the floor for/??in five minutes.

On the MR account (3) should be telic for the same reason (2a) is. Yet it is atelic, suggesting that the figure is also an incremental theme. Furthermore, it is not simply that the event stands in an INC and an MR simultaneously: (a) different proper parts of the wine could move at the same point in the event (albeit with respect to different subpaths), violating the INC, and (b) non-adjacent subpaths can be traversed at temporally adjacent subevents (albeit by different parts of the wine), violating the MR. This suggests a more complex interaction between the arguments.

I propose to capture (3) by recognizing that movement relations are an inherently three-place, mutually-constraining relation between a figure x , a path p , and an event e (following a suggestion

by DeLancey 2000 that one cannot understand the notion of figure without a notion of ground and vice versa). In particular, a motion event e can be decomposed into a series of motion subevents, each of which corresponds to some proper part of x crossing the entire path p (following the multiplicity of events approach suggested by Filip 1999:141-142). For example, (3) can be decomposed into subevents of each proper subpart of wine flowing from the jar to the floor. This can be modeled via the ternary Figure/Path θ -Relation (FPR) in (4), which recursively “slices off” a unique motion subevent of e across the path p (modeled by Krifka’s MR) for each unique part of the figure x , leaving the rest of e and the rest of x to stand in an FPR with p in the recursive case (4b) (which grounds out in the base case (4a) that e is itself a motion event of x across p).

- (4) A relation θ is an Figure/Path Relation (FPR) iff for every e, x, p such that $\theta(e, x, p)$:
- a. e and p stand in an MR or
 - b. there exists proper subpart x' of x for which there exist unique proper subevent e' of e such that e' stands in an MR to p and the remainder of x and e stand in an FPR with p ($\exists x' \exists e' [x' < x \wedge e' < e \wedge MR(\{< e', p >\}) \wedge FPR(\{< e \ominus e', x \ominus x', p >\})$]).

An FPR is an isomorphism between x and e up to individual motion subevents, mirroring the INC in (1) and thus explaining the otherwise unexpected atelicity of (3): each proper subpart of wine is still wine and is associated with a subevent of crossing the entire path that also satisfies (3). Furthermore, (4) also decomposes the event in terms of the path. For any given subpath, each MR in (4b) determines a unique subevent corresponding to that subpath (for some unique part of the figure). The summation of these subevents corresponds to the entire figure crossing that subpath, effectively preserving the original MR analysis and thus predicting the atelicity of (2b) in the same fashion as before: each proper subpath of some arbitrary path is still a path and is associated with a subevent of the entire figure crossing it that also satisfies (2b). Thus (4) provides multiple ways of viewing the event: as a single event or decomposed according to the mereological properties of the figure, the path, or both. Ultimately, a predicate is telic iff quantization/boundedness constraints are placed on *both* the figure and path, predicting that only (2a) is telic. However, the constraints on each argument make reference to the other, something only possible with ternary thematic roles.

This model also has application beyond motion. Change-of-state is often analyzed as motion along an abstract path/scale (Krifka 1998, Filip 1999, Hay et al. 1999), e.g. in *wipe the table clean* the table moves along a scale of “cleanliness”. Crucially, such verbs also show double incremental theme effects, where telicity requires boundedness of the scale *and* quantization of patient:

- (5) a. Caesar wiped the table for/??in an hour. (unbounded scale, quantized patient)
 b. Caesar wiped tables clean for/??in an hour. (bounded scale, non-quantized patient)
 c. Caesar wiped the table clean in/?for an hour. (bounded scale, quantized patient)

This suggests an FPR analysis, though along a more abstract path. FPRs can even be extended to creation/consumption predicates, where the relevant scale is the existence/volume of the incremental theme (Hay et al. 1999, Wechsler 2005, Beavers 2006, 2007). Crucially, such predicates can also be atelic when the result state is compromised, e.g. in the conative alternation the “completely drunk” entailment of *drink* is eliminated, yielding atelicity despite the quantized patient:

- (6) Caesar drank at his beer (slowly) for/??in an hour. (unbounded scale, quantized patient)

Thus it appears that all dynamic predicates are amenable to the ternary figure/path analysis proposed here, tying together all such predicates under a single homomorphism, rather than the disparate set of homomorphic relationships typically assumed for different classes of predicates.