

Deriving Aspectual Classes from Scales of Change

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Aspectual classes (e.g. accomplishments, achievements, activities) are often modeled via event decompositions (Dowty 1979) or featural breakdowns (Olsen 1994). However, decompositions often do not correspond to appropriate aspectual properties (Rappaport Hovav 2005), while binary features typically produce more or fewer classes than actually attested, and often are not precisely defined enough to predict significant interactions. Likewise, predicate classes such as semelfactives (Rothstein 2004) and degree achievements (Hay et al. 1999) tend to defy standard classification schemes. I offer a new view on (non-stative) aspectual classes building on scalar models of change-of-state as a transition a theme x for predicate P makes along a property scale s_P (Krifka 1998, Hay et al. 1999, Beavers 2008), where a homomorphism θ between s_P and e preserves the mereological properties of adjacency and number of subparts. I show that a constrained set of aspectual classes emerges from cross-classifying predicates by two previously, independently motivated factors: how specific P is about the endpoints of s_P (relevant for objecthood; Beavers 2006) and the mereological complexity of s_P (relevant for resultatives; Wechsler 2005). This in turn predicts significant interactions between aspectual classes and other motivating phenomena, especially argument realization.

Specificity of the endpoints of s_P corresponds to the degree of affectedness of x . Consider (1), in which intuitively *the apple* is decreasingly less affected from (1a) to (1d).

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|-----|---------------------|---|
| (1) | a. peel the apple | (Apple is completely de-skinned) |
| | b. cut the apple | (Apple cut, not necessarily to a particular degree) |
| | c. kick the apple | (Apple impinged, not necessarily affected) |
| | d. caress the apple | (Apple manipulated, not necessarily impinged) |

The change is *quantized* if x reaches a specific, unique result state g_P on s_P in e (i.e. $result(x, s_P, e, g_P)$ obtains; cf. (1a)). Quantized changes determine telicity (Hay et al. 1999): e ends when x reaches g_P . The change is *non-quantized* if a result is entailed to exist, but is not uniquely specified (cf. (1b)). A *potential for change* is a non-quantized change at some possible world (cf. (1c)). Being *unspecified* for a change is where no transition is necessarily possible (cf. (1d)). These degrees of affectedness form an implicational hierarchy (for all P, x, e) through existential generalizations (over results, worlds, and thematic roles respectively):

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|-----|--------------------------------------|---|--|-------------------------------------|
| (2) | $result(x, s_P, e, g_P) \rightarrow$ | $\exists g[result(x, s_P, e, g)] \rightarrow$ | $\Diamond \exists g[result(x, s_P, e, g)] \rightarrow$ | $\exists \theta[\theta(x, s_P, e)]$ |
| | (quantized) | (non-quantized) | (potential) | (unspecified) |

This hierarchy is relevant for object realization. For example, the conative alternation can be modeled as minimal decreases in the affectedness of x for different verb classes (Beavers 2006):

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|-----|--|--------------------------------|
| (3) | Alternation | Object/Oblique Contrast |
| | a. Consumption verbs: <i>Marie ate (at) her cake.</i> | (quantized/non-quantized) |
| | b. Cutting verbs: <i>Marie cut/sliced (at) the rope.</i> | (non-quantized/potential) |
| | c. Impact verbs: <i>Marie hit/kicked (at) Defarge.</i> | (potential/unspecified) |

Turning to mereological complexity, scales come in two types: binary (non-gradable; *dead, pregnant*) and >binary (gradable; *flat, to death*) (Kennedy and McNally 2005). Beavers (2008)

shows that the θ -relation between e and s_P ensures that there are thus only two types of dynamic events: binary (punctual) and $>$ binary (durative). Preservation of this distinction from s_P to e explains the fact that punctual predicates only allow non-gradable result phrases and durative predicates only allow gradable ones (Wechsler 2005):

- (4) a. With six well-placed shots, Wyatt shot the outlaw to death/#dead.
b. With one well-placed shot, Wyatt shot the outlaw dead/#to death.

Crucially, cross-classifying predicates by these two independently motivated factors produces the extended version of the traditional Vendler classes in (5) (with one additional class ruled out, discussed below).

(5)	<i>binary/punctual</i>	<i>>binary/durative</i>
<i>unspecified</i>	Semelfactives <i>blink (once)</i>	Activities <i>caress the apple</i>
.....
<i>potential</i>	Semelfactives <i>slap the apple (once)</i>	Activities <i>beat the apple (drunkenly)</i>
<i>non-quantized</i>	N/A	Degree achievements <i>cool the soup, cut the apple</i>
<i>quantized</i>	Achievements <i>shatter the vase</i>	Accomplishments <i>eat the apple</i>

Many predicates fall into multiple classes, e.g. semelfactives are activities when iterative (Rothstein 2004), degree achievements are achievements when punctual and accomplishments when bounded (as in a resultative; Hay et al. 1999). By the above definitions of affectedness and mereological complexity, each class corresponds to a unique cluster of appropriate linguistic properties: only durative predicates pass durativity tests, only punctual predicates and accomplishments pass telicity tests, only (non-)quantized change predicates pass affectedness tests (e.g. result entailments), and only non-unspecified predicates pass impingement tests (e.g. *What happened to X is Y*; Cruse 1973). Thus each class shows a unique cluster of identifying properties, all of which independently fall out of how mereological complexity and affectedness are defined.

These two factors also interact significantly to make interesting predictions about argument realization. Beavers's (2006) analysis of the conative can alternatively be viewed as an aspectual class shift, mapping a predicate in one class in (5) to the class above it. This rules out conatives for unspecified changes (cf. **John touched at the apple*). However, achievements also do not undergo the conative:

- (6) John broke/punctured/pricked/shattered/splintered (*at) the vase.

This is due to the missing class in (5). Non-quantized, punctual predicates are semantically vacuous, since on a binary scale (from $\neg\phi$ to ϕ) the result state is always uniquely specified (ϕ). Thus this class is indistinguishable from achievements. This predicts (6), since the resultant aspectual type of applying the conative to an achievement is ruled out, making dyadic achievements categorical transitives. This correlation of achievements to transitivity is supported cross-linguistically: Tsunoda (1981) shows that punctual predicates entailing high affectedness are core transitive and often admit no alternations. Thus this analysis links aspectual classes, argument realization, and transitivity together in terms of shared sets of precisely-defined primitives that interact to predict the right clusters of properties and to rule out certain predicate types.

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