Progressive Achievements and the Intentionality Restriction

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Introduction. Achievements are often considered incompatible with the progressive, as they are instantaneous, while the progressive requires its embedded predicate to be durative (Vendler 1957). However, as many researchers have observed, some achievements can appear in the progressive (e.g., Dowty 1979). Carlson (1981) argues that the achievements that can appear in the progressive are those that involve an extended gradual change, what Bach (1986) refers to as *culminations*. Notably, unlike activities and accomplishments, achievements in the progressive do not have a *component process* reading (Kearns 2003); instead, they typically give a *preliminary process* reading (Gyarmathy 2015, also see Smith 1991; Piñón 1997; Rothstein 2004). For example, the progressive accomplishment in (1a) is true of a component part of a possible complete event of Sam building a house (the *component process* reading). In contrast, the progressive achievement in (1b) is not true of a component part of a possible complete event of Sam arriving at the station, but rather of a preparatory stage leading up to Sam's arrival (the *preliminary process* reading).

(1) a. Sam is building a house. b. Sam is arriving at the station.

A puzzle noticed in the literature but still unresolved is that progressive achievements impose an *intentionality restriction* on their subjects (Truswell 2011; Martin 2015, 2020). Consider the achievement *wake up*. With an intentional subject such as *Sam*, (2a) is true in a scenario where Sam is engaged in some activities directed towards waking up Ana; Ana may wake up either some time later (*non-imminent*) or immediately after (*imminent*). In contrast, with a non-intentional subject such as *the dishwasher' noise*, (2b) is infelicitous in a context where the dishwasher's noise is ongoing and Ana wakes up some time later; it is acceptable only when Ana's waking up is imminent. Therefore, the *non-imminent* reading is only possible with intentional subjects.

(2) a. *Intentional Subject*
Sam is waking up Ana.
Non-imminent reading **possible**

b. *Non-Intentional Subject*
The dishwasher's noise is waking up Ana.
Non-imminent reading **impossible**

However, there are exceptions to the intentionality restriction. As Martin (2015) observes, *machine* subjects pattern with intentional subjects in allowing the non-imminent reading for progressive achievements (see (3a)). Building on this, I add that *instruments*, namely objects that move or act only when manipulated by an intentional participant, also pattern with intentional subjects (see (3b)). In what follows, I provide a causal-model account of this restriction.

(3) a. *Machine Subject*
The alarm clock is waking up Ana.
Non-imminent reading **possible**

b. *Instrument Subject*
The plane is landing.
Non-imminent reading **possible**

Aspectual shift. Following Moens & Steedman (1988), Rothstein (2004), among others, I argue that achievements are coerced into durative predicates under the progressive. Specifically, I argue with Gyarmathy (2015) that the progressive operator requires its embedded predicate to be associated with a *complex* scale. Since achievements involve *simplex* scales, they violate this felicity requirement. One possible repair strategy is the following: the predicate undergoes a meaning shift so that it denotes a different set of events naturally associated with a complex scale. I argue that this strategy is implemented via an *aspectual shift operation* (see (4)). Here, P' denotes an activity predicate closely related to P, an achievement. A scale is defined as an ordered set $\langle S,$

≤⟩, where S is a nonempty set of states, and ≤ is a linear order over S. A scale may be *complex* (*CMP*) (associated with more than two subparts) or *simplex* (*SMP*) (associated with exactly two subparts). *INCR* stands for an incremental relation, and R stands for either an incremental or non-incremental relation. Under this view, the progressive can be analyzed as an *extensional* partitive operator (see (5a)), which is the mirror image of the perfective aspect (see (5b)).

(4) SHIFT($\lambda e.[P(e) \wedge SMP(S) \wedge INCR(e, S)]$) = $\lambda e.[P'(e) \wedge CMP(S) \wedge R(e, S)]$

(5) a. $[\![\text{PROG}]\!] = \lambda w \lambda t \lambda P.\exists e.[\tau(e) \supseteq t \wedge P(e)(w)]$ b. $[\![\text{PFV}]\!] = \lambda w \lambda t \lambda P.\exists e.[\tau(e) \subseteq t \wedge P(e)(w)]$

Account in a nutshell. I argue that an achievement predicate P is conceptually related to its activity counterpart P' (P-in-progress). P is conceptually basic, while P' derives from P and must satisfy two causal-model-based conditions which specify the relationship between them. These conditions are satisfied by both intentional and non-intentional subjects under the *imminent* reading of P', but are more readily met by intentional than non-intentional subjects under the *non-imminent* reading of P'. Therefore, the *non-imminent* reading is *typically* possible only with intentional subjects.

A probabilistic causal-model. Causal models, given their influential formalization in Pearl (2000), have found fruitful applications in linguistics (Schulz 2011; Kaufmann 2013; Lassiter 2017; Nadathur & Bar-Asher Siegal 2024). Following Lassiter (2017), I adopt a *probabilistic causal model*, which is a quadruple $\langle W, D, F, \mu \rangle$, where W is a set of possible worlds; D is a causal structure $\langle \boldsymbol{V}, \Rightarrow \rangle$, where $\boldsymbol{V}$ is a set of variables and ⇒ encodes direct causal relations among them; F is a set of functions that assign each variable in $\boldsymbol{V}$ a value in {0, 1} based on the values of its parents; μ is a probability measure. I argue that the constraints on P' can be defined as two conditions on the relationship between P and P'. I propose that P' denotes a set of events such that they meet **1)** the *causal relevance condition* (an event causally relevant to the culmination of P has occurred at the reference time) and **2)** the *probabilistic bias condition* (given the situation (a set of events), the culmination of P is likely (>0.5) but not guaranteed (<1) to occur in the actual world).

Deriving the intentionality restriction. While derived activities allow both intentional and non-intentional subjects under the *imminent* reading, they *typically* occur only with intentional ones under the *non-imminent* reading. I propose that this restriction arises because non-intentional subjects generally fail to satisfy the *probabilistic bias condition*, except when P' is *imminent* or in cases like (3). Consider (2) first. Knowing that Sam wants to wake up Ana and is engaged in some activities carried out to achieve this goal, the probability that Ana wakes up some time later is close to certainty, making the *non-imminent* reading possible. Knowing that the dishwasher is making noise does not predict whether Ana wakes up some time later, making the *non-imminent* reading infelicitous. However, if we notice that there are signs that Ana is about to wake up, then the probability that Ana wakes up will be significantly raised, making the *imminent* reading available. Now consider (3). For *instruments*, although they lack intention themselves, they presuppose the presence of an intentional manipulator. From the instrument, we can infer relevant facts about this implicit participant, such as their intention, plan, or desire, which strongly predict the future development of the event. In (3b), the plane is operated by a pilot. If the plane starts to lose altitude, it can be inferred that the pilot has initiated and intends to complete the landing process, making the culmination highly probable and thus licensing the *non-imminent* reading. *Machines* require a different account. Unlike instruments, they can act on their own, yet their functions are the result of prior human design. Machines are engineered so that their intended function will be reliably realized when in use. For example, alarm clocks are designed to wake sleepers by producing loud

noise, which typically achieves the desired effect. Observing an alarm clock sounding makes it highly probable that the sleeper will wake, hence the acceptability of the *non-imminent* reading.

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