

GRADABILITY AND THE CORRECT ANALYSIS OF PROGRESSIVE ACHIEVEMENTS

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*The exit polls were clear:
Kerry was winning in a landslide.*
Thom Hartman,
CommonDreams.org 11/6/2004

OVERVIEW

- ❖ The puzzle of progressive achievements
- ❖ Verkuyl's critique
- ❖ Coercion: the standard analysis
- ❖ State change, gradability, and the achievement-accomplishment distinction
- ❖ The alternative: progressive achievements are prospective
- ❖ Conclusions

I. THE PUZZLE OF PROGRESSIVE ACHIEVEMENTS

- Vendler's (1957) "time schemata of verbs" deconstructed (cf. Mourelatos 1981; Smith 1991: 30; Van Valin & LaPolla 1997: 91-102)

	dynamic	telic	instantaneous
states	-	-	-
activities	+	-	-
accomplishments	+	+	-
achievements	+	+	+

Table 1. A decomposition of Vendler's aspectual classes

- achievements describe instantaneous events – Dowty 1979: 59

(1) entailment pattern of accomplishments (a) vs. achievements (b) w/ time span specifications¹
 a. *John painted the picture in an hour*
 ∴ *John spent an hour painting the picture*
 b. *John noticed the picture in a few minutes*
 not.: ??*John spent a few minutes noticing the picture*

¹ 'Semelfactives' such as *blink* and *jump* (cf. Jackendoff 1996; Smith 1991: 29-30) are not considered here. These have salient iterative interpretations in the progressive.

- (2) incompatibility of *stop* (except under habitual readings) and *finish* w/ achievements (b, d)
- John stopped painting the picture*
 - (*)*John stopped noticing the picture*
 - John finished painting the picture*
 - **John finished noticing the picture*

- (3) ambiguity of *almost* with accomplishments (a), but not achievements (b)
- John almost painted the picture*
'...but he never started' / '...but he never finished'
 - John almost noticed the picture*

- yet, many achievements are compatible with progressive aspect (under non-*"futate"* readings)

- (4) progressive achievements – Freed 1979: 52
- He is dying*
 - She is winning the race*
 - ?*David is forgetting the story*

- (5) progressive achievements – Rothstein 2004: 36
- Susan was arriving at the station when she heard that trains to Jerusalem had been cancelled because of the state of the line*
 - Dafna is finding her shoes*
 - Fred and Susan are finally leaving*
 - The old man is dying*
 - The plane is landing*
 - Jane is just reaching the summit*
 - ?*Jane is reaching the summit of the mountain*
 - ?*Mary is spotting her friend at the party*

- (6) progressive achievements – WWW
- Thought I **was dying**...was only Effexor withdrawals. ...*
 - By faith, Jacob, when he **was dying**, blessed each of the sons of Joseph, and worshiped, leaning on the top of his staff (Hebrews 11:21)*
 - ...I realized that this building **was collapsing**...*
 - ...crews had to rescue one resident from her burning apartment as the floor around her **was collapsing***
 - ...the outhouse that it replaced was built in 1940 and desperately needed replacing because the roof **was caving in***
 - ...either the well **was caving in**, or it was almost dry*
 - The danger of the bursting dam destroying me did not bother me so much as maybe missing the chance to know why it **was bursting***
 - This effort was pursued while the dot-com bubble **was bursting***
 - As he **was entering** into the boat, he who had been possessed by demons begged him that he might be with him (Mark 5:18)*

j. *Then boom; I **was entering** Lowell* (John Foster, "Entering Marion")

- How can this be? How is it possible to present an instantaneous event as being in progress?

(7) semantics of the imperfective function of the progressive – let

P be an event predicate

t_{TOP} range over possible 'topic times' in the sense of Klein 1994 (roughly, the time for which the truth of proposition is evaluated)

e range over events

$\tau(e)$ denote the 'run time' of even e

\subset_T be the partial order relation of proper inclusion among time intervals

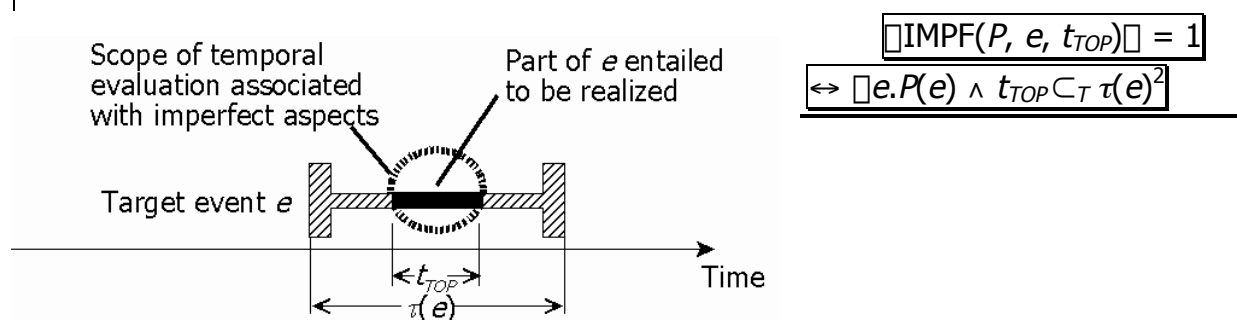


Figure 1. A Kleinian semantics of the imperfective function of the progressive

CRITIQUE

- Verkuyl 1989: the distinction between accomplishments and achievements is purely conceptual, not linguistic, and thus should be abandoned in aspectual classifications

"...there are no decisive criteria for Achievementhood ... from the point of view of language the *length* of (a time unit involved in) an event does not qualify as a meaning element that distinguishes certain verbs from others. ... Given these considerations I would conclude that there is no ground for distinguishing Achievement terms from Accomplishment terms." (Verkuyl 1989: 58)

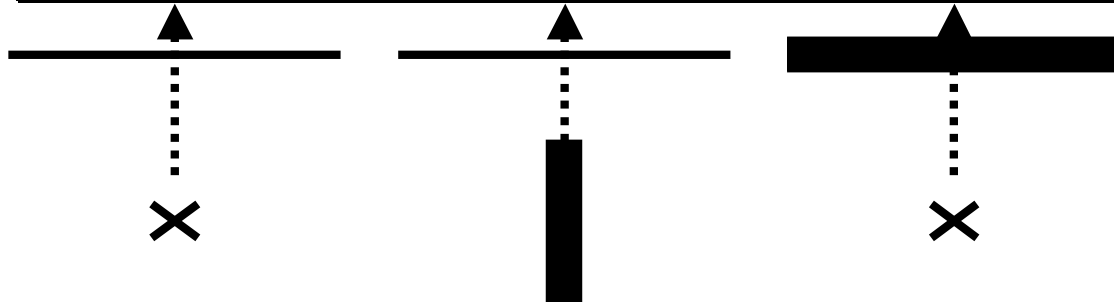
- the substance of Verkuyl's observation: many verbs are compatible with both instantaneous and durative interpretations, depending on their arguments

(8) cross with achievement (a) and accomplishment (b-c) interpretations, depending on whether Figure (c), Ground (b), or neither (a) are conceptualized as spatially extended

² This ignores the modal aspects of the imperfective. On the modal semantics proposed by Portner 1998 (cf. also Dowty 1979 and Landman 1992), for $\text{IMPF}(P, e, t_{TOP})$ to be true, $\Box e.P(e) \wedge t_{TOP} \subset_T \tau(e)$ is merely required to hold in *inertia worlds*, i.e., worlds which are optimal wrt. a modal base and ordering source in the sense of Kratzer 1977, the former capturing the "set of circumstances relevant to whether e is completed", the latter comprising the "set of propositions which assert that e does not get interrupted" (Portner 1998: 774).

II. VERKUYL'S

- a. *Floyd crossed the line in half an hour*
not ∴ ??*Floyd spent half an hour crossing the line*
- b. *Louis and Clark crossed the Mississippi in half an hour*
∴ *Louis and Clark spent half an hour crossing the Mississippi*
- c. *The Korean People's Army crossed the 38th Parallel in eight hours*
∴ *The Korean People's Army spent eight hours crossing the 38th Parallel*



point crossing line
- instantaneous

extended Figure crossing
line - durative

point crossing extended
Ground - durative

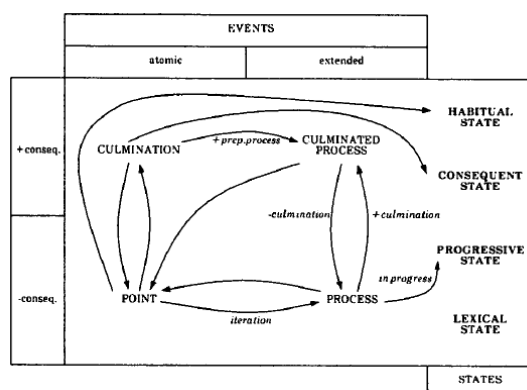
Figure 2. Compositional durativity in change of location descriptions

- Durativity is a compositional property. This aligns with Verkuyl's (1972, 1989, 1992) own findings regarding telicity. This does not mean that durativity is not a linguistic property (cf. also Mittwoch 1991).
- Progressive achievements such as those in (4)-(6) cannot be explained in this way. If they are indeed durative, it is not due to properties of their argument referents.

III. COERCION: THE STANDARD ANALYSIS

(9) assumptions of the standard coercion analysis of progressive achievements (Binnick 1991: 194-197; Brinton 1988: 173-175; Mittwoch 1991; and Moens & Steedman 1988: 19; Rothstein 2004; *inter alia*)

- event types denoted by accomplishments are composed out of instantaneous culminations (state changes) and preparatory processes or activities
- achievement readings denote the culmination only
- accomplishment readings denote both culmination and preparatory process
- apparent achievement verbs that are compatible with the progressive actually have both readings
- the progressive in combination with achievement verbs triggers an accomplishment reading



IV. STATE CHANGE, GRADABILITY, AND THE ACHIEVEMENT-ACCOMPLISHMENT DISTINCTION

- a fundamental difference between (uncoerced) accomplishments and progressive achievements: with the former, imperfective progressives scope out a part of the change phase of the event – with the latter, this is impossible

- (10) progressive accomplishments: partial change interpretations salient, arguably entailed
- At midnight, Floyd was still writing his LTE. At this point, he had written three paragraphs.*
 - Sally was eating a pastrami sandwich. When she noticed the anchovy, she had eaten about half of the sandwich.*
 - The glacier had been melting at a faster pace. When the research team returned, a chunk of several feet had melted.*
 - The train was entering the St Gotthard Tunnel when the control center stopped it. At this moment, three cars had already entered the tunnel.*

- (11) progressive achievements: partial change interpretations impossible
- Jacob, when he was dying, blessed each of the sons of Joseph. At this moment, *part of Joseph had already died.*
 - I needed to know why the dam was bursting. When I reached it, *nearly half of the dam had burst.*
 - The exit polls were clear: John Kerry was winning the election. By this time, *he had already won most of the election.*
 - Susan was arriving at the station. When she heard that trains to Jerusalem had been cancelled, *she had arrived at the station halfway.*

- this difference cannot be accounted for under the standard coercion analysis, which predicts exactly the same semantics for progressive accomplishments and progressive achievements (assumption 9a above is false)
- towards an explanation of the difference: achievements describe state changes with non-gradable end states

- (12) achievements describe state changes with non-gradable end states: assumptions
- achievements are a type of state change descriptions (Dowty 1979)
 - state changes are transitions from a source state to an end state (von Wright 1963)
 - states are linguistically described as properties of themes (Gruber 1965)
 - properties are gradable if they map into a scale that measures the degree to which they apply to the theme (Kennedy 1999)
 - the merological structure of state change events maps homomorphically into the **degree of change** of the theme (Kennedy & Levin 2001)
 - incrementality of change entails gradability of the property that characterizes the end state

- Kennedy & Levin 2001: generalizing the degree of change (DoC) across different types of state change descriptions

- (13) state change descriptions with 'incremental themes' (Dowty 1991; Krifka 1989, 1992, 1998): DoC characterizes the merological part of the theme affected by the change
- Floyd ate part/half/most/nearly all of the sandwich*
∴ *The sandwich wound up partly/half/mostly/nearly completely eaten*
 - Sally wrote part/half/most/nearly all of the letter*
∴ *The letter wound up partly/half/mostly/nearly completely written*
 - Part/half/most/nearly all of the ice melted*
∴ *The ice wound up partly/half/mostly/nearly completely melted*

- (14) location change descriptions: DoC characterizes the part of the path traversed by the Figure
- Floyd walked partway/halfway/most of the way/nearly all the way from Paris to Rouen*
∴ *Floyd ended up partway/halfway/most of the way/nearly all the way in Rouen/from Paris to Rouen*
 - The car skidded partway/halfway/most of the way/nearly all the way into the driveway*
∴ *The car ended up partway/halfway/most of the way/nearly all the way into the driveway*

- (15) degree achievements (Abusch 1985; Bertinetto & Squartini 1995; Dowty 1979: 88-91; Hay, Kennedy, & Levin 1999): DoC characterizes the theme's change on some measurement scale
- The water level rose (by) five inches*
∴ *The water level became five inches higher*
 - The mixture cooled down (by) five degrees*
∴ *The mixture became five degrees cooler*
 - The train's speed increased by five mph*
∴ *The train became five mph faster*

- state change descriptions whose end states are characterized by gradable properties are accomplishments. Achievements have non-gradable end states.

- (16) non-motion achievements: the change cannot affect proper parts of the theme because the property that characterizes the end state does not apply to proper parts of the theme
- *Part/half/most/nearly all of Josef died/was dead*
 - Part/half/most/nearly all of the ?dam/*balloon/*tire burst/was burst*
 - *John Kerry won part/half/most/nearly all of the election*
**Part/half/most/nearly all of the election was/had been won*

- (17) motion achievements: the path cannot be traversed incrementally because the event description does not entail an extended path, but merely location change wrt. a single ground
- **Susan arrived/was partway/halfway/most of the way/nearly all the way at the station*
 - **Jane reached/was at the summit partway/halfway/most of the way/nearly all the way*
 - **Floyd (had) crossed the line partway/halfway/most of the way/nearly all the way*

- the role of gradability in state change semantics can be formalized following Kennedy & Levin (2001)³

- (18) state change semantics and gradability – let
- P be a property predicate
 - x range over individuals
 - e range over events
 - $d \in [0, 1]$ ranges over real numbers that describe the degree to which property P applies to individual x at a given point in time (the degree of change DoC)
 - t_{INI} , t_{FIN} denote the lower and upper bound, respectively, of the run time interval $_ (e)$

$$\boxed{\text{CHANGE}(P, x, e, d) = 1 \leftrightarrow \neg e \sqsupset x.\text{theme}(e, x) \wedge \neg P(x, d)^{t_{INI}} = 0 \wedge \neg P(x, d)^{t_{FIN}} = 1}$$

1

- an event e can be characterized as a change of theme x in property P by degree d iff P applies to x to degree d at the end point t_{FIN} of the event, but not at the beginning t_{INI}
- if the end state P is non-gradable, d can only assume the values 0 and 1: there is no time at which the theme is in an intermediate stage – therefore, the change is necessarily instantaneous⁴
- at any moment in time: a person is either alive or dead, has or has not reached a summit or arrived at the station; a dam or balloon has or has not burst; etc. – hence, events described by *die*, *reach*, *arrive*, or *burst* are necessarily instantaneous⁵
- a wrinkle: while non-gradable properties cannot change incrementally, gradable properties can *but need not* change incrementally – hence, accomplishments may admit instantaneous interpretations

³ The CHANGE predicate in (18) is adopted from Kennedy & Levin 2001. What is new here is that the DoC is explicitly tied to the end state of the event via the theme argument.

⁴ Wechsler 2002 and Beaver 2004, in studies of the event structure of English resultative constructions, reach the same conclusion, based likewise on Kennedy & Levin 2001. Their treatment differs from mine in that they assume a homomorphism between the merological structure of the event and a literal or metaphorical path along a DoC scale, without explicit reference to the end state of the event.

⁵ If their theme/Figure argument is quantized, that is; cf. Krifka 1989, 1992, 1998.

- (19) degree achievements with durative/instantaneous interpretations
- The water level rose (by) five inches in two hours/an instant*
 - The mixture cooled down (by) five degrees in two minutes/at once*
 - The train's speed increased by five mph in two second/immediately*

V. THE ALTERNATIVE: PROGRESSIVE ACHIEVEMENTS ARE PROSPECTIVE

- the logical alternative to the coercion analysis: discard the imperfective interpretation of the progressive in combination with achievements
- Dowty (1977) was the first to explore this route. In a nutshell, Dowty proposed that progressive achievements display the futurate progressive, for whose truth conditions he hoped to account in terms of a compositional combination of the imperfective progressive and the tenseless future.

- (20) future (a), tenseless future (b), and futurate progressive (c) (Dowty 1977: 67)
- Tomorrow, the Yankees will play the Red Socks*
 - Tomorrow, the Yankees play the Red Socks*
 - Tomorrow, the Yankees are playing the Red Socks*

- Dowty noted that the futurate progressive, like the tenseless future, often involves an element of intention or planning

- (21) future (a), tenseless future (b), and futurate progressive (c) with unplanned events (Dowty 1977: 67)
- Tomorrow, the Yankees will play well*
 - ?Tomorrow, the Yankees play well*
 - ?Tomorrow, the Yankees are playing well*

- Under the present proposal, the progressive has a **prospective aspect** interpretation in addition to the imperfective interpretation. Whether this prospective reading also accounts for the futurate progressive remains open.
- Following Comrie (1976: 64-65), prospective aspect can be characterized as a mirror image of the perfect: the latter scopes into a result state of the event described by the root VP, whereas the former scopes into a pre-state of the event

"The perfect is retrospective, in that it establishes a relation between a state at one time and a situation at an earlier time. If languages were completely symmetrical, one might equally well expect to find prospective forms, where a state is related to some subsequent situation, for instance where someone is in a state of being about to do something. Many languages do have means of giving overt expression to prospective meaning ... Typical English expressions of prospective meaning are the constructions *to be going to*, *to be about to*, *to be on the point of*, as in *the ship is about to sail*, *the ship is on the point of sailing* – both of which describe the ship's present state relative to some future event, with these constructions an imminently future event – and *the ship is going to sail*, where there is again a present state related to a future event, but here without any implication of imminent futurity." (Comrie 1976: 64)

- initial evidence for the prospective analysis of progressive achievements:

progressive achievements admit paraphrases with *be about to*, though not with *be going to*

(22) prospective paraphrases of progressive achievements

- a. *Josef was dying*
 ∴ *Josef was about to die*
 not ∴ *Josef was going to die*
- b. *The dam was bursting*
 ∴ *The dam was about to burst*
 not ∴ *The dam was going to burst*
- c. *John Kerry was winning the election*
 ∴ *John Kerry was about to win the election*
 not ∴ *John Kerry was going to win the election*
- d. *Susan was arriving at the station*
 ∴ *Susan was about to arrive at the station*
 not ∴ *Susan was going to arrive at the station*

- *be going to* is not admissible as a paraphrase of progressive achievements, since it conveys an element of prediction of realization of the root VP event that is absent in progressive achievements and in the *be about to* construction
- prospective interpretations of progressive accomplishments are marginally possible as well (Dowty 1977)

(23) progressive accomplishments with prospective interpretations

- a. *At midnight, Floyd was still writing his LTE. In fact, he hadn't even really started – he was still only about to write the LTE.*
- b. *Sally was eating a pastrami sandwich. Luckily, when she noticed the anchovy, she hadn't started yet – she was merely about to eat the sandwich.*
- c. *The train was entering the St Gotthard Tunnel when the control center stopped it. At this moment, the train was about to enter the tunnel.*

- towards a formalization: prospective aspects constrain the temporal evaluation of a clause to possible 'topic times' that overlap with a state preceding the root VP event in a causal chain

(24) semantics of prospective aspect – let

P be an event predicate

t_{TOP} range over possible 'topic times' in the sense of Klein 1994⁶

e range over events

s range over states

$\tau(s)$ denote the 'run time' of state s

\subset_T be the partial order relation of proper inclusion among time intervals

⁶ The analysis of prospective semantics presented here differs from Klein's (1994: 108, 114-117) own proposal in that Klein assumes the topic time merely to precede the run time of the root VP event, not constraining it to overlap with a causal pre-state, as I do; cf. Bohnemeyer 2002: 38-44.

$$\boxed{\text{PROSP}(P, e, t_{TOP})} = 1 \leftrightarrow \exists e \exists s. P(e) \wedge \text{CAUSE}(s, e) \wedge t_{TOP} \subset_T \tau(s)^7$$

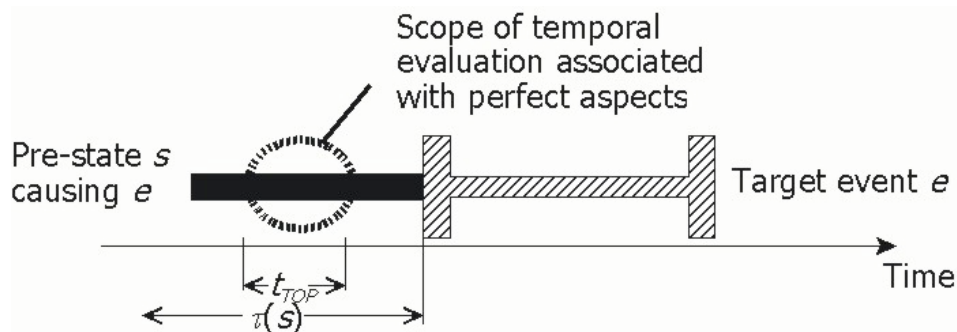


Figure 4. A Kleinian semantics for prospective aspects

- prospective and imperfective aspects (cf. Figure 1) are conceptually related in that neither entails completion of the root VP event – thus it is not surprising that both may be expressed by the same construction
- given that prospective readings of progressive accomplishments are possible (23), the most parsimonious analysis is that the English progressive is vague between an imperfective and a prospective interpretation
- on this account, the fact that imperfective interpretations are much more prominent than prospective ones with accomplishments is most likely a consequence of a stereotypicality implicature on the basis of Grice's first Quantity Maxim (Atlas & Levinson 1981)
- one issue that remains to be addressed: what counts as a causal pre-state?

(25) causal pre-states: arrive

- Susan was going to the station*
- Susan was arriving at the station*
- Susan was about to arrive at the station*

- as Rothstein (2004: 42-45) observes, (25a) is true at any moment during Susan's travel to the station – e.g., midway – whereas (25b) is not (and neither is 25c)
- however, temporal proximity is not itself part of the truth conditions of the prospective

(26) prospective aspect does not entail temporal proximity

The Leaning Tower of Pisa has been about to fall for 600 years

- assuming a standard analysis of causality in terms of counterfactual conditionals (Lewis 1973), the data can be interpreted to the effect that Susan's being on her way is not a strong enough condition on her arriving at the station to license the prospective

⁷ Again, on a modal semantics such as Portner's (1998), for $\text{PROSP}(P, e, t_{TOP})$ to be true, $\Box e.P(e)$ merely has to hold in inertia worlds.

(27) causal pre-states: find

- a. *Josef was dying*
- b. *Right now, Floyd is finding his wallet*
- c. *The exit polls were clear: John Kerry was winning the election*

- a causal pre-state that may license *be dying* is a life-threatening illness
- a possible scenario for (27b): Floyd is inspecting every piece of furniture in the room; he's now starting to inspect the piece of furniture where the speaker knows the wallet to be hidden; given Floyd's method of inspection, as evidenced by his previous activity, the speaker knows that Floyd will find the wallet unless thwarted by the unexpected intervention of another causal force
- similarly, (27c) will be interpreted to the effect that the speaker took the exit polls as evidence of JK's imminent victory at the polls *barring the unexpected intervention of some other causal force*

VI. CONCLUSIONS

- ❖ the coercion analysis of progressive achievements cannot explain why the progressive saliently scopes into the change phase with progressive accomplishments, whereas such an interpretation is impossible with progressive achievements
- ❖ the explanation for this difference is that incremental change entails gradability of the property that characterizes the end state – achievements describe changes whose end states are non-gradable
- ❖ if a coercion analysis of progressive achievements is not tenable, the imperfective interpretation of the progressive in combination with achievements must be discarded
- ❖ the most plausible alternative is that the English progressive is vague between imperfective and prospective interpretations
- ❖ under this analysis, constraints on progressive achievements are a special case of constraints on prospective interpretations – both require sufficient evidence of a state that will bring about the target event in inertia worlds (Dowty 1979; Landman 1992; Portner 1998)

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