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Progressive achievements in English

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ABSTRACT

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This paper explores the preliminary process reading that arises from achievements in the progressive. The meaning of the progressive as a partitive operator poses challenges in the formalization of its occurrence with punctual predicates like achievements. I discuss problems with prior proposals (Rothstein 2004, Bohnemeyer 2005), and argue that the preliminary process reading should be accounted for in terms of the meaning of achievements rather than the meaning of the progressive. Based on Bach's (1981) subdivision of achievements, I propose to analyze culmination-achievements as denoting a set of complex events which consist of a preliminary process and its culmination, while analyzing happening-achievements as a set of simple events of culmination. I show how the lexical specifications of the two subtypes of achievements result in the different patterns in the progressive. Furthermore, I argue that culmination-achievements differ from accomplishments in terms of the discourse statuses of the implications which are associated with their two subevents. Building on previous studies on projective contents (e.g. Simons et al. 2011, Tonhauser et al. 2013, 2018), I take a close look at the properties of the process implication triggered by culmination-achievements, and show that it is projective content.

KEYWORDS

achievements, progressive, imperfective paradox, culmination, happening, projective content

1. Introduction

According to Vendler's (1967) classification of Aktionsarten, achievements such as *recognize, notice, realize, win, arrive, find, die* are characterized as being dynamic, telic, and punctual. Their occurrence in the progressive is often taken as unacceptable in a normal context, as illustrated in (1a). This contrasts with progressive sentences with accomplishments and processes such as (1b-c).

(1) a. #John was recognizing Mary when I stopped by his office.
b. John was writing an essay when I entered the room.
c. John was swimming when I saw him.

However, it has been observed that some achievements like *win, arrive, find, die* can occur in the progressive, as illustrated in (2). They give rise to a *preliminary process reading*, according to which an instantaneous event described does not culminate but its preparatory stage is in progress, e.g. a train was moving toward the station in (2b).[1]

(2) a. John was winning the game when I went to sleep.
b. A train was arriving at the station when I left for the concert.
c. Amy was dying when I visited her.

Previous authors (e.g. Carlson 1981, Filip 1999, Martin 2011, Gyarmathy 2015) have noted that the preliminary process reading arises from a subclass of achievements called *culminations* (e.g. *win, arrive, find, die*) in Bach's (1981) subdivision of achievements; I call this subclass *culmination-achievements* and the other *happening-achievements* (e.g. *realize, recognize, notice*), henceforth.

This paper explores how culmination-achievements in the progressive give rise to the preliminary process reading while happening-achievements do not. A significant challenge in the analysis of the preliminary process reading is concerned with the meaning of the progressive. A progressive sentence asserts that a part of a described event is in progress. For example, (3) asserts that the event of John's building a house has not been completed, but its subpart is ongoing at the utterance time. That is, (3) is true iff there exists a part of the described event.

(3) John is building a house.

Given the meaning of the progressive as a partitive operator, achievements are predicted *not* to occur in the progressive since it is inconceivable that there is a subpart of an instantaneous event.[2] That is, the unacceptability of sentences like (1a) is straightforwardly predicted, but the preliminary process reading in examples like (2) calls for further analysis, particularly how the reading arises from the interaction between achievements and the progressive.

[1] This reading has also been referred to as the *preliminary stage-focusing reading* (Smith 1991) and the *preliminary circumstance reading* (Kearns 2003).

[2] This analysis of the progressive as a partitive operator is based on Link's (1983) proposal on nominal semantics. In his theory, the nominal domain consists of at least two sub-domains, i.e. the count domain and the mass domain, and each domain is highly structured. This view is carried over to the partitive analysis of a progressive sentence, whereby its semantics is analyzed in terms of a mereological relations among events.

We can consider two possible ways to address this problem. One is to connect the preliminary process reading to the meaning of achievements, and the other approach is to attribute the reading to the meaning of the progressive. I review two different prior approaches to the preliminary process reading along these lines. First, Rothstein (2004) argues that achievements are lexically specified as denoting an instantaneous event, but the progressive coerces them into having a durative meaning via a type shifting operation. In contrast, Bohnemeyer (2005) argues that the meaning of the progressive is not restricted to the imperfective meaning, but it has the prospective meaning as well. He accounts for the preliminary process reading in terms of the prospective meaning of the progressive. I discuss problems with these analyses and argue that the preliminary process reading must be accounted for in terms of the meaning of achievements, but not in terms of the meaning of the progressive.

In this paper, adopting Bach's (1981) classification of achievements into two subtypes, I argue that each subtype has a different lexical specification; while happening-achievements (e.g. *realize, notice, recognize*) denote a set of simple event of culmination as in Vendler's characterization of achievements, culmination-achievements (e.g. *win, arrive, find, die*) denote a set of complex events that are composed of two subevents, i.e. a preparatory process and its culmination (cf. Piñón 1997, 2008). I empirically motivate this proposal from different patterns of inference, known as the *Imperfective Paradox*, between happening-achievements and culmination-achievements. I assume the uniform semantics of the progressive as having the imperfective meaning, and account for the preliminary process reading in terms of the relation between the whole event and its non-final subevent. The proposed lexical specification of culmination-achievements is analogous to that of accomplishments in terms of their event structures comprising two subevents, but I argue that they differ in terms of the discourse statuses of the implications which are associated with the two subevents. I focus on the properties of the process implication (associated with the process subevent of culmination-achievements), which is analyzed as presupposed content in the literature (e.g. Piñón 1997, Heyde-Zybatow 2008, Martin 2011, Gyarmathy 2015). Building on recent research on projective content (e.g. Simons et al. 2011, Tonhauser et al. 2013, 2018), I examine the properties of the process implication, and show that it is projective content which is not part of the common ground but its local anchoring is obligatory in attitude contexts.

This paper is organized as follows: I first review previous proposals on the preliminary process reading in §2. §3 provides the proposed analysis, and §4 concludes the paper.

2. Previous Studies

This section reviews prior works on progressive achievements: Rothstein's (2004) proposal on a derived accomplishment meaning via coercion operation (§ 2.1), and Bohnemeyer's (2005) proposal on the progressive as prospective aspect (§ 2.2).

2.1 Rothstein's (2004) Coercion Analysis

In the literature, a coercion analysis has been regarded as a standard approach to progressive achievements (e.g. Mittwoch 1991, Moens and Steedman 1988, Rothstein 2004, See more references in Bohnemeyer 2005). Rothstein's (2004) type shifting operation represents these coercion analyses. Assuming different lexical specifications of achievements and accomplishments as in (4), she argues that the progressive triggers a type shifting operation by which achievements are coerced to have an accomplishment meaning. More specifically, achievements denote a set of simple events of culmination whereas accomplishments denote a set of complex

events which are the sum of an activity subevent e_1 and a culmination subevent e_2.[3] According to the shifting rule in (5), the derived accomplishment is the sum of two subevents like a lexical accomplishment, but the activity subevent remains to be contextually determined, by having a free variable α as the complement of the DO operator.

(4) a. Achievements $\lambda e.(\text{BECOME}(P))(e)$
b. Accomplishments $\lambda e.\exists e_1\ \exists e_2\ [e = {}^{S}(e_1 \cup e_2) \wedge (\text{DO}(P))(e_1) \wedge \text{Cul}(e) = e_2\ ]$

(5) SHIFT ($\text{VP}_{\text{punctual}}$):
$\lambda e.(\text{BECOME})(e) \rightarrow \lambda e.\exists e_1 \exists e_2\ [e = {}^{S}(e_1 \cup e_2) \wedge (\text{DO}(\alpha))(e_1) \wedge\ (\text{BECOME}(P))(e_2) \wedge \text{Cul}(e) = e_2\ ]$
(Rothstein 2004: 48)

Rothstein's (2004) shifting operation in (5), however, does not account for why progressive sentences with achievements like *realize, notice, recognize*, etc. do not yield a preliminary process reading, but they are judged to be unacceptable, as shown in (1a).[4]

2.2 Bohnemeyer's (2005) Prospective Aspect Analysis

Bohnemeyer (2005) provides an alternative analysis of the preliminary process reading with progressive achievements. He argues for the vagueness of the English progressive between imperfective and prospective interpretations. That is, the progressive typically has an imperfective aspectual meaning, thereby the event time of a described event is constrained to extend over the contextually given topic time.[5] He analyzes the English progressive as having a prospective meaning as well; it locates the event time of a described event after the topic time, and thus its pre-state overlaps the topic time. Bohnemeyer (2005) attributes the preliminary process reading of progressive achievements to the prospective meaning of the progressive, which is formalized as in (6).

(6) $[\![\ \text{PROSP}\ (P, e, t_{TOP}\ )]\!] = 1 \leftrightarrow\ \exists e\ \exists s.\ P(e) \wedge\ \text{CAUSE}(s, e)\ \wedge\ t_{TOP} \subset_{\text{T}} \tau(s)$

In (6), the CAUSE operator combines with *e* (for a described event) and *s* (for its pre-state). Crucially, the topic

[3] The DO operator and the BECOME operator (Dowty 1979) are utilized in (4) and (5).

[4] These predicates are known to give rise to the so-called *slow-motion reading* in a particular context like a film commentary. Under such contexts, an instantaneous event can be construed as being stretched over the utterance time.

(i) [Context: While watching a movie, the speaker is describing some scenes to his girlfriend on the phone:]
a. John is noticing the mark on the wall.
b. John is realizing the fact that he left the map at home.
c. John is recognizing his old friend sitting right next to him.

Rothstein (2004) proposes a shifting operation in (ii) for the slow-motion reading; it coerces achievements to have an activity meaning, as formulated by means of the DO operator.

(ii) SHIFT($\text{VP}_{\text{punctual}}$): $\lambda e.(\text{BECOME}(P))(e) \rightarrow \lambda e.(\text{DO}(\text{BECOME}(P)))(e)$ (Rothstein 2004: 57)

However, note that (ii) also applies to $\text{VP}_{\text{punctual}}$ in the same fashion as (5), and hence it remains unexplained why some predicates like *arrive, win, find, die* give rise to the preliminary process reading and others like *realize, recognize, notice* yield the slow-motion reading.

[5] See Klein (1994) for the notion of topic time, which refers to the time span about which the speaker makes a statement.

time t_{TOP} is included within the run-time of the pre-state *s*, and thus the preliminary process reading is correctly predicted by this analysis.

This vagueness analysis, however, cannot account for why a preliminary process reading is exclusively yielded by achievements while other Aktionsarten give rise to an imperfective reading in the progressive. As we have seen in examples like (1) and (2), progressive sentences with activities and accomplishments have an imperfective reading while those with achievements like *win, arrive, find, die* have a preliminary process reading. Merely assuming a vague meaning of the progressive is not sufficient to correctly capture the interpretation of progressive sentences with different Aktionsarten.

Also, it is crucial to note that a preliminary process reading arises from other constructions as well. For example, in *how long* questions like (7), which force a described event to be construed as being durative, achievements give rise to a preliminary process reading; that is, in (7b), the speaker is inquiring about the time span of the process that took place before John reached the summit. Their occurrence in the *take* time construction or with *in*-adverbials results in the preliminary process reading as well; in (8b) and (9b), the temporal expression *three days* specifies the time span before John reached the summit. This differs from accomplishments which yield the event duration reading such that the entire event described takes some time from the start to the end; that is, the relevant time span in (7a), (8a), and (9a) is from the moment that John started building the barn to the moment that he finished it.

(7) a. How long did it take John to build the barn? [accomplishment]
b. How long did it take John to reach the summit? [achievement]

(8) a. It took two days for John to build the barn. [accomplishment]
b. It took three days for John to reach the summit. [achievement]

(9) a. John built the barn in two days. [accomplishment]
b. John reached the summit in three days. [achievement]

Examples like (7b), (8b), and (9b) independently motivate that the preliminary process reading must be accounted for in terms of the meaning of achievements, rather than the meaning of the progressive.

Furthermore, Bohnemeyer (2005) attempts to empirically support his analysis by observing the parallels between the preliminary process reading and the futurate progressive like (10).

(10) Tomorrow, the Yankees are playing the Red Socks. (Bohnemeyer 2005: 8)

However, the futurate progressive, which was first noted by Dowty (1977), does not necessitate positing a prospective meaning on the progressive. The temporal interpretation of examples like (10) can be straightforwardly captured by assuming two different types of lexical aspects, i.e. ordering aspect and inclusion aspect. I follow Rullmann and Matthewson's (2018) assumption on their hierarchical order in (11) and the denotations in (12)-(13):

(11) tense > modal > ordering aspect > inclusion aspect > VP

(12) a. $[\![\text{PERF}]\!]^{g,t0,w0,f,h} = \lambda P_{<i,st>}\, \lambda t\, \lambda w.\exists t'\, [t' < t \;\&\; P(t')(w)]$

b. $[\![\text{NONPERF}]\!]^{g,t0,w0,f,h} = \lambda P_{<i,st>}\, \lambda t\, \lambda w.\exists t'\, [t \leq t' \;\&\; P(t')(w)]$

(13) a. $[\![\text{PFV}]\!]^{g,t0,w0,f,h} = \lambda P_{<l,st>}\, \lambda t\, \lambda w.\exists e\, [P(e)(w) \;\&\; \tau(e) \subseteq t]$

b. $[\![\text{IPFV}]\!]^{g,t0,w0,f,h} = \lambda P_{<l,st>}\, \lambda t\, \lambda w.\exists e\, [P(e)(w) \;\&\; t \subseteq \tau(e)]$

(Rullmann and Matthewson 2018: 287)

We can analyze (10) as containing a phonologically null non-perfect aspect as well as an overt imperfective aspect. The former locates the run-time of the event of the Yankees playing the Red Socks in the nonpast time of the utterance time, and the latter constrains the run-time to include the topic time. That is, the futurate meaning of present progressive sentences like (10) is derived from the aspectual meaning of the non-perfect. In fact, Bohnemeyer (2005) quotes Comrie (1976) that 'prospective aspect can be characterized as a mirror image of the perfect'. Under the assumption on the presence of non-perfect aspect, which is independently motivated for the temporal interpretation of English sentences (Rullmann and Matthewson 2018), we do not need to stipulate a prospective meaning on the progressive for sentences like (10) as well as for sentences with culmination-achievements.

3. Proposed Analysis

I present a proposed analysis in this section. I first show that happening-achievements (e.g. *realize, notice, recognize*) and culmination-achievements (e.g. *win, arrive, find, die*) exhibit different patterns of Imperfective Paradox, and it poses a problem for the characterization of achievements as an instantaneous event (§ 3.1). I propose that the two subtypes of achievements have different lexical specifications; culmination-achievements denote a set of complex events comprising a culmination and its preparatory process, while happening-achievements denote a set of simple events of culmination (§ 3.2). Assuming the uniform semantics of the progressive, I account for how its interaction with culmination-achievements gives rise to the preliminary process reading, whereas its occurrence with happening-achievements is unacceptable (§ 3.3). The proposed analysis of culmination-achievements is reminiscent of the event structure of accomplishments consisting of two subevents, but I argue for the different discourse statuses of the implications that are associated with the two subevents. I focus on the properties of the process implication arising from culmination-achievements and show that it is projective content which does not impose a requirement on the common ground but is obligatorily anchored to a local individual in attitude contexts (§ 3.4).

3.1 Subinterval Property and Imperfective Paradox

An atelic eventuality is distinguished from a telic eventuality by its subinterval property. For example, in the case of atelic eventualities such as the state of John's being asleep, if John was asleep from 1pm to 2pm, then he was asleep at all subintervals of the time span. In contrast, telic eventualities such as John's building a bridge does not have this subinterval property; that is, if John built a bridge from January 1st, 2020 through June 1st, 2020, it is

not true that he built a bridge at any subinterval of this time span.[6]

The discrepancy in the subinterval property gives rise to different inference patterns between telic and atelic predicates when they occur in the progressive. With atelic predicates like activities, the truth of a simple past tensed sentence can be inferred from its corresponding past progressive sentence as in (14a), or the truth of a present perfect sentence is inferable from its corresponding present progressive sentence as in (14b). However, this kind of inference is impossible with telic predicates like accomplishments, as shown in (15); this phenomenon was dubbed *Imperfective Paradox* (Dowty 1977).

(14) a. John was watching TV. [activity]
→ John watched TV.
b. John is watching TV.
→ John has watched TV.

(15) a. John was building a house. [accomplishment]
↛ John built a house.
b. John is building a house.
↛ John has built a house.

It has long been held that achievements display the imperfective paradox like accomplishments (e.g. Dowty 1979), but Rothstein (2004) makes an important observation that the two subtypes of achievements exhibit different inference patterns in the progressive. The following examples from Rothstein (2004) show that culmination-achievements induce the imperfective paradox (like accomplishments), but happening-achievements do not (like activities).

(16) Culmination-achievements
a. He was dying of disease X when they discovered the new wonder drug (so he didn't die of disease X).
b. The plane was landing when it exploded in midair (so it didn't land).
c. Jane was just reaching the summit when there was an avalanche (so she didn't reach it).
(Rothstein 2004: 39)

(17) Happening-achievements
a. #Mary is spotting her arch enemy at the party, but she hasn't yet spotted her.
b. #The critic is noticing the new picture, but she hasn't noticed it yet.
c. #Dafna is realizing that her mother has come to pick her up from kindergarten, but she hasn't realized it yet. (Rothstein 2004: 57)

[6] Instead of the term 'subinterval property', the more general term 'homogeneity' has also been used in the literature (e.g. Rothstein 2004). Note that the latter can be applied to nominals as well, such as *fence*, *wall* and *lawn*. Crucially, however, the two terms are conceptually equivalent, as shown below:

(i) If a predicate is homogeneous then *x P-ed for y time* ENTAILS that at any time during *y*, *x P-ed* was true.
(Rothstein 2004: 14)

In Vendler's (1967) classification of Aktionsarten, achievements are telic just like accomplishments, but they differ in terms of durativity. A crucial question that arises from the above patterns of the imperfective paradox is how we can apply the notion of subinterval property to non-durative events like achievements. Under the assumption that achievements denote an instantaneous event, we cannot analyze them as having a subinterval property, and hence the different patterns between (16) and (17) are left unexplained.

3.2 Culmination-Achievements as Denoting a Set of Complex Events

Vendler (1967) classifies achievements and accomplishments as expressing a dynamic eventuality which has a culmination point. This dynamic meaning is often explained in terms of the concept of change of state. Although 'change-of-state' eventualities usually take time up to the culmination point, achievements have been conceptualized as being instantaneous; that is, its denotation does not include the prior process leading up to a culmination point, but it is a simple punctual event merely consisting of a culmination point. In this paper, I follow Bach's (1981) subdivision of achievements into two subtypes, and propose to analyze culmination-achievements as denoting a set of complex events like accomplishments; that is, they are composed of two subevents, i.e. a culmination and its preparatory process, whereas happening-achievements denote a set of simple events of culmination as in Vendler's characterization of achievements.

The proposed view on culmination-achievements builds on previous studies (e.g. Verkuyl 1989, Piñón 1997, 2008). Verkuyl (1989) points out the lack of 'decisive criteria for achievementhood', particularly in comparison with accomplishments. Piñón's (1997, 2008) analysis is also in this line. Assuming two different sorts of eventualities (called happenings and boundary happenings), he analyzes an achievement event as a right-boundary happening, and thus it ontologically presupposes its preparatory process. For example, a finding event presupposes a searching event, because the former is the right boundary of the latter, as represented by the following axiom.

(18) $\forall e\, \forall t_r\, [(\mathbf{find}(e) \wedge \tau(e) \subseteq t_r) \rightarrow \exists e'\, [\mathbf{search}(e') \wedge t_r \subseteq \tau(e') \wedge \mathbf{right\text{-}boundary\text{-}of}(e, e')]]$
(Piñón 2008: 171)

Following these analyses, I formalize the aspectual meaning of two different types of achievements in terms of Condoravdi's (2002) AT-predicate; it reflects the long-standing empirical findings that events and states have a different temporal relationship between event time and reference time (e.g. Kamp and Rohrer 1983; Partee 1984; Dowty 1986; Hinrichs 1986; Klein 1994), as follows:

(19) AT(t, w, P)
$= \exists e\, [P(w)(e) \wedge \tau(e, w) \subset t]$ if P is eventive.
$= \exists e\, [P(w)(e) \wedge t \subseteq \tau(e, w)]$ if P is stative.

According to (19), when the property P of the eventuality e is instantiated at t in w, its run-time at w is included in t with events, but the reversed inclusion relationship holds with states.

I make use of the BECOME-operator in the formalization of happening-achievements. Also, following Bohnemeyer (2005), I employ the CAUSE-operator for the relationship between the two subevents of culmination-achievements. The underlined parts represent (i) the temporal contiguity between the two subevents, and (ii) the

temporal location of subevent e_2 which is constrained to be included in the given reference time t.[7]

(20) AT(t, w, P)
= $\exists e$ [BECOME(P(w)(e)) $\wedge$ τ(e, w) $\subset$ t] if P is a happening-achievement.
= $\exists e_1.\exists e_2$ [CAUSE(e_1, BECOME(P(w)(e_2))) $\wedge$ $\underline{\tau(e_1, w) \ll \tau(e_2, w)}$ $\wedge$ $\underline{\tau(e_2, w) \subset t}$] if P is a culmination-achievement.

Under the proposed analysis, we do not need to posit a particular coercion operation only for culmination-achievements that give rise to the preliminary process reading in the progressive. Instead, culmination-achievements are lexically specified as denoting a set of complex events of two subevents just like accomplishments. Despite the similar lexical specifications between culmination-achievements and accomplishments, I argue that their subevents have a different discourse status. In §3.4, I examine the properties of the implication associated with the process subevent of culmination-achievements and show that it is not asserted but it is projective content. Before moving on to this discourse-related issue, the next section discusses the semantics of the progressive and presents my proposal on how it interacts with the two subtypes of achievements.

3.3 The Progressive as a Partitive Operator

I adopt Portner's (1998) analysis of the progressive; it builds on Kratzer's (1977, 1981) modal theory, and makes use of events in the formalization, as follows:[8]

(21) PROG(e, P) is true at a world w iff for all worlds w' in BEST(Circ, NI, e, P), there is an event e' which includes e as a nonfinal subpart, such that $P(w')(e')$ is true. (Portner 1998:782)

In (21), the progressive is a modal operator with a circumstantial (Circ) modal base and a non-interruption (NI) ordering source, each of which is a function from events and event descriptions to sets of propositions. More specifically, Circ determines the set of accessible worlds as those in which certain contextually specified facts hold, and NI ranks the worlds where the event does not get interrupted more highly than those in which it does. That is, a progressive sentence asserts that given the circumstantial facts relevant to the event e, if it is not interrupted, it will become an event described by P.[9]

Crucially, (21) reflects the partitive analysis of the progressive, by specifying that e is a 'non-final' subpart of e'. This 'non-final' relation between the entire event and its subpart originates from Bennett and Partee's (1972) analysis in (22). The formalization in (22) is couched within interval-based semantics, but the relation between the two intervals I and I' is analogous to that between e and e' in (21).

[7] The symbol $\ll$ stands for an immediate precedence relation between two intervals, which is defined as follows:

(i) $t' \ll t \leftrightarrow t' < t \wedge \neg\exists t''[\, t' < t'' \wedge t'' < t\,]$

[8] See, e.g. Dowty (1972, 1977, 1979), Asher (1992), Landman (1992), Bonomi (1997), for other modal analyses of the meaning of the progressive.

[9] See Portner (1998) for further discussion on why the modal base is sensitive not only to the event described but also to the way it is described.

(22) [Prog ϕ] is true at interval I iff there exists an interval I' such that $I \subset I'$, I is not a final subinterval of I', and ϕ is true at I'.

I argue that the preliminary process reading arises from a progressive sentence with culmination-achievements because of the 'non-final' relation between an event and its subpart (or an interval and its subpart). Recall that culmination-achievements denote a set of complex event e which consists of a process subevent e_1 and its culmination subevent e_2. Given that e_2 is near instantaneous, the non-final subevent of e, to which the progressive operator is applied, necessarily concerns the process subevent e_1. That is, whenever a culmination-achievement occurs in the progressive, it is construed as e_1 being in progress, yielding a preliminary process reading.

This contrasts with the cases where happening-achievements like *realize, notice, recognize* occur in the progressive; such sentences are judged to be unacceptable, as we have seen in (1a). In the proposed analysis, happening-achievements denote a set of simple events which consist of only a culmination point, and thus a partitive meaning of the progressive cannot be applied to them. This results in the unacceptability of sentences like (1a) unless a particular discourse context like a film commentary is assumed.

3.4 Two Subevents of Culmination-Achievements in Different Discourse Statuses

The central part of the proposed analysis is that culmination-achievements denote a set of complex events consisting of a process subevent and a culmination subevent as accomplishments do. In this section, I argue that despite this commonality, culmination-achievements differ from accomplishments in terms of the discourse statuses of the implications pertaining to their subevents; while both subevents of accomplishments are associated with asserted content, those of achievements are not. For instance, utterances with culmination-achievements like (23) give rise to at least two implications each of which pertains to a subevent of the winning event, i.e. John's participating in the game and his winning it. This is the same as utterances with accomplishments like (24), i.e. the process of John's building a barn, and its culmination.

(23) John won the game.
→ John was participating in the game. [process implication]
→ The game ended up with John's winning it. [climax implication]

(24) John built a barn.
→ John was building a barn. [process implication]
→ John completed building a barn. [climax implication]

Crucially, in the case of culmination-achievements, the climax implication (associated with the culmination subevent) is asserted content, but the process implication (associated with the process subevent) is not. When the culmination-achievement sentence in (23) is negated, it still gives rise to the process implication, as shown in (25). In contrast, the process implication does not arise from the negative version of (24) with accomplishments, as shown in (26).

(25) John did **not** win the game.
→ John was participating in the game. [process implication]
↛ The game ended up with John's winning it. [climax implication]

(26) John did **not** build a barn.
↛ John was building a barn. [process implication]
↛ John completed building a barn. [climax implication]

Previous researchers such as Piñón (1997), Heyde-Zybatow (2008), Martin (2011), and Gyarmathy (2015), for example, analyze the occurrence of a process subevent of culmination-achievements as presupposed content. In recent studies on projective content (e.g. Simons et al. 2011, Tonhauser et al. 2013, 2018), what have been classically analyzed as presupposed contents are explored in terms of their projective behaviors and some other relevant properties. More specifically, Tonhauser et al. (2013) show that the pre-state implication triggered by *stop* is projective content, and examine the two relevant properties, i.e. STRONG CONTEXTUAL FELICITY and OBLIGATORY LOCAL EFFECT. They explore a variety of expressions or constructions that have been observed to give rise to an unasserted meaning such as classical presuppositions and Potts's (2005) conventional implicatures. In this section, I focus on the projective behaviors of the process implications that arise from utterances with culmination-achievements like the following:

(27) a. John won/lost the game.
→ John was participating in the game. [process implication]
b. John reached/arrived at the station.
→ John was moving toward the station. [process implication]
c. John found/discovered the book.
→ John was looking for the book. [process implication]
d. John died of liver cancer.
→ John was dying of liver cancer. [process implication]

3.4.1 Projectivity

Projectivity concerns whether the speaker is committed to the implication although its triggering expression/construction occurs under the scope of operators such as negation; these operators prevent the implication triggered by the expressions/constructions in their scope from projecting globally. For example, the climax implication in (23) does not project under negation, as we have seen in (25); that is, the speaker of (25) cannot be understood as being committed to the climax implication. Given the entailment-canceling properties of operators like negation, projectivity is diagnosed by checking whether the target implication survives under their scope. When we apply the diagnostics, often called the Family-of-Sentences diagnostics (e.g. Chierchia & McConnell-Ginet 1990, Geurts 1999, Beaver & Geurts 2013), the process implications in (27) are projective, as shown in (28)-(31), where the culmination-achievements occur under negation or modal, or in the antecedent of a conditional or in a polar question. In other words, uttering the following sentences with entailment-cancelling operators still commits the speaker to the process implication.

(28) a. John did not win/lose the game. [negation]
b. If John won/lost the game, Mary will get very excited/sad. [conditional antecedent]
c. It is possible that John won/lost the game. [modal]
d. Did John win/lose the game? [question]

(29) a. John did not reach/arrive at the station. [negation]
b. If John reached/arrived at the station, Mary will get very excited. [conditional antecedent]
c. It is possible that John reached/arrived at the station. [modal]
d. Did John reach/arrive at the station? [question]

(30) a. John did not find/discover the book. [negation]
b. If John found/discovered the book, Mary will get very excited. [conditional antecedent]
c. It is possible that John found/discovered the book. [modal]
d. Did John find/discover the book? [question]

(31) a. John did not die of liver cancer. [negation]
b. If John died of liver cancer, Mary will get very sad. [conditional antecedent]
c. It is possible that John died of liver cancer. [modal]
d. Did John die of liver cancer? [question]

While the above Family-of-Sentences diagnostics show the projectivity of a process implication, it is worthwhile to note that there is some variation in their projectivity. The projective behavior of the process implication triggered by some culmination-achievement is less robust than that of implications from other triggers. My informants report that the process implication triggered by *win* and *lose* is stronger than those from other culmination-achievements like *find, die, arrive*. This kind of variability in projection behaviors has long been observed in the literature. For example, expressions like *win* and *discover* are considered 'soft triggers' while factive verbs like *know* are typically regarded as 'hard triggers' (e.g. Abusch 2010, Abrusán 2016, Jayez et al. 2015). Previous experimental studies (e.g. Xue and Onea 2011, Smith and Hall 2011, Tonhauser et al. 2018) provide strong support for such variability in projectivity. Although a quantitative experiment has not been conducted for this work, I take the informants' responses to lend further support for the previous claim on projectivity variability.[10]

3.4.2 Not part of the common ground

Typical presuppositional contents have been known to impose a constraint on the common ground. For example, the expression *too* gives rise to the implication on the existence of contextually salient alternative(s), as follows:

(32) John went to the library, too.
→ Someone other than John went to the library. [implication on existence of alternative]

[10] Projectivity is affected by our world knowledge (Tonhauser et al. 2018). To illustrate, consider the following examples that contain the culmination-achievement *die*.

(i) John died of a heart attack.
→ John was dying of a heart attack. [process implication]

The process implication in (i) is projective, but again it seems to be less robust than the sentence with *die* in (31). Our world knowledge on whether the eventuality described is likely to have a temporal extent or not significantly affects projectivity. For example, the event of someone dying of cancer is often assumed to have a more temporal extent than that of someone dying of a heart attack, and thus a sentence describing the former event seems to be more projective than that describing the latter event.

Unlike classical presuppositions like (32), some presuppositional contents are known not to be part of the common ground, but they offer new information for the addressee (e.g. Karttunen 1974, Stalnaker 1998, 2008, Abbott 2000, 2008, Tonhauser 2015). To take an example, an utterance with the factive verb *know* gives rise to an implication associated with the content of its complement, but it is felicitous although the implication has not been already established among the interlocutors.

(33) I know that John passed the exam.
→ John passed the exam. [implication on the complement]

Tonhauser et al. (2013) distinguish these two types of projective contents in terms of STRONG CONTEXTUAL FELICITY constraint, which is meant to diagnose whether the projective content under investigation must be entailed or implied by an utterance context to be felicitous. When we apply the diagnostic to the process implication, it is observed not to be subject to the constraint. In (34), for example, the speaker has no clue whether the addressee is committed to the process implication or not, i.e. the utterance context is neutral with respect to this implication.

(34) [Context: The speaker ran across her old friend at the museum. They graduated from the same elementary school, but they have not met each other for the past 20 years. Now, they are talking about their classmates;]
a. Jenny became a pianist, and she won the first prize at the national competition last month.
b. Mary arrived at the airport a few minutes ago, and I will be meeting with her tonight.
c. David found a gold mine in Africa a few years ago, and he became a billionaire.
d. Amy died of liver cancer last year.

The utterances in (34) are felicitous in the given context, which indicates that the process implication triggered by a culmination-achievement is not part of the common ground.

3.4.3 Obligatory local anchoring

The other property that Tonhauser et al. (2013) utilize in the taxonomy of projective contents is concerned with their behaviors with respect to embedding operators such as propositional attitude predicates; they call this property OBLIGATORY LOCAL EFFECT. More specifically, when a trigger is embedded under predicates like *believe* or *think*, the triggered implication can be anchored to the attitude holder (denoted by a matrix clause subject) or the speaker. For example, in (35), the existence implication triggered by *too* is anchored to Mary, as shown by the two (in)felicitous continuations. In contrast, the implication triggered by the expressive *bastard* in (36) is necessarily anchored to the speaker; that is, (36) cannot be construed as Sue having a negative emotion on Kresge, but it conveys that the speaker dislikes Kresge, as shown by the continuations.

(35) Mary_i believes that John failed the exam, too.
a. #She_i doesn't think that someone other than John failed the exam.
b. I don't think that someone other than John failed the exam.

(36) Sue$_i$ believes that that bastard Kresge should not be fired.
a. She$_i$ thinks he's a good guy.
b. #I think he's a good guy. (adapted from Potts 2007: 170)

We now turn to the process implication triggered by culmination-achievements. When they are embedded in attitude contexts, the process implication is necessarily anchored to the attitude holder. This is again indicated by the (in)felicitous continuations below:

(37) Mary$_i$ believes that John won the race.
a. #She$_i$ doesn't think that he participated in the race.
b. I don't think that he participated in the race.

(38) Mary$_i$ believes that John arrived at the station.
a. #She$_i$ doesn't think that he moved toward the station.
b. I don't think that he moved toward the station.

(39) Mary$_i$ believes that John found the book.
a. #She$_i$ doesn't think that he looked for the book.
b. I don't think that he looked for the book.

(40) Mary$_i$ believes that John died of liver cancer.
a. #She$_i$ doesn't think that he was dying of liver cancer.
b. I don't think that he was dying of liver cancer.

In these examples, the process implication cannot be interpreted outside the scope of the attitude predicate, but it is construed as involving Mary's belief. That is, the process implication is subject to the OBLIGATORY LOCAL EFFECT.

4. Summary and Conclusion

This paper investigated the preliminary process reading with progressive achievements. I followed the prior observation that a subclass of achievements such as *win, arrive, find, die* is available with the preliminary process reading; they belong to culmination-achievements in Bach's (1981) classification of Aktionsarten. I argued that they denote a set of complex events consisting of two subevents, i.e. a preparatory process and its culmination (cf. Piñón 1997, Piñón 2008) while the other subclass called happening-achievements (e.g. *realize, notice, recognize*) denotes a set of simple event of culmination as in Vendler's characterization of achievements. This differs from Rothstein's (2004) coercion analysis which derives the durative meaning from achievements via a type shifting operation. I also discussed the problems with Bohnemeyer (2005), which argues for the non-uniform semantics of the progressive; he maintains that the progressive has the prospective meaning as well as the imperfective meaning, and accounts for the preliminary process reading in terms of its prospective meaning. I provided pieces of empirical evidence indicating that the preliminary process reading must be accounted for in terms of the meaning of achievements instead of the meaning of the progressive.

Assuming the uniform semantics of the progressive as a partitive operator, I accounted for the preliminary process reading in terms of the 'non-final' relation between the whole event and its subevent. The unacceptability of happening-achievements in the progressive is straightforwardly predicted as well, because the partitive meaning of the progressive cannot be applied to happening-achievements which denote a set of simple instantaneous events. In the proposed analysis, achievements are the same as accomplishments in that they denote a set of complex events. But I argued that they differ in terms of the discourse statuses of the implications which are associated with the two subevents. I focused on the properties of the process implication associated with the process subevent of culmination-achievements, which was analyzed as presupposed content in the literature (e.g. Piñón 1997, Heyde-Zybatow 2008, Martin 2011, Gyarmathy 2015). Building on the previous studies on projective contents (e.g. Simons et al. 2011, Tonhauser et al. 2013, 2018), I examined the properties of the process implication triggered by culmination-achievements, and showed that it is projective content which does not impose a STRONG CONTEXTUAL FELICITY constraint on the common ground but has an OBLIGATORY LOCAL EFFECT under attitude predicates.

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Examples in: English
Applicable Languages: English
Applicable Level: All

