Subevental structure and non-culmination

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1   Introduction: Predicate decomposition

Since Dowty (1979) accomplishments are analyzed as involving at least two components: an activity/process performed by the agent/causer and change of state of the theme induced by this activity/process. Taking a non-decompositional event-based analysis in (1) as a point of departure, in (2)-(7) I provide a few illustrations about how (the relevant part of the meaning of) the sentence *John closed the door* would be analyzed within different theories of predicate decomposition, putting tense and grammatical aspect aside.

(1) $\|$John close the door$\| = \lambda$e[agent(John)(e) $\wedge$ close(door)(e)]

   In (1), I use the neo-Davidsonian association of the external argument with events via the Agent thematic role, but the Davidsonian association of the internal argument, see Kratzer (2003) for discussion. This choice plays no role in what follows, however. For simplicity, I represent arguments as individual constants.

(2)   Dowty 1979
      [[DO (John, [close(John)])] CAUSE [BECOME [closed (door)]]]

(3)   Rappaport Hovav, Levin 1998
      [[John ACT] CAUSE [BECOME [door <*closed*>]]]

(4)   Kratzer 2000 and elsewhere, Paslawska, von Stechow, 2003
      $\|$ John close the door $\| =$
      λe$\exists$s[agent(John)(e) $\wedge$ close(e) $\wedge$ CAUSE(s)(e) $\wedge$ closed(the door)(s)]

(5)   Pylkkänen 2002
      $\|$ John close the door $\| =$
      λe[agent(John)(e) $\wedge$ $\exists$e'[closing(e') $\wedge$ Theme(the door)(e) $\wedge$CAUSE(e')(e)]]

(6) Rothstein 2004
|| John close the door || =
$\lambda e \exists e_1 \exists e_2 [e = {}^S(e_1 \cup e_2) \wedge$ Activity$(e_1) \wedge$ Agent$(e_1)=$John $\wedge$ Theme$(e_1)=$door
$\wedge$ Become$_{<closed>}(e_2) \wedge$ Arg$(e_2)=$Theme$(e_1) \wedge$ INCR$(e_1, e_2, C(e_2))]$,
where ${}^S(e_1 \cup e_2)$ is a singular entity created out of e_1 and e_2, INCR is an incremental relation between events with respect to the incremental chain C.

(7) Ramchand 2003, 2008 with a few adjustments
|| John close the door || =
$\lambda e \exists e_2 \exists e_3 \exists e_4 \exists e_5 [$close-a$(e_2) \wedge$ Causing$(e_2) \wedge e = e_2 \rightarrow e_3 \wedge$ Subject(John)(e_2)
$\wedge$ close-p$(e_4) \wedge$ Process$(e_4) \wedge e_3 = (e_4 \rightarrow e_5) \wedge$ Subject(the door)(e_4)
$\wedge$ close-s$(e_5) \wedge$ State$(e_5) \wedge$ Subject(the door)$(e_5)]$[1]
where "$\rightarrow$" is a "lead to" or "cause" relation on events, close-a, close-p, and close-s are predicates denoting closing activities, processes of getting closed, and states of being closed, respectively.

As is evident from (2)-(7), theories of predicate decomposition vary along different dimensions. Firstly, proposals represented in (4)-(7) exploit event semantics, while (2)-(3) are eventless. Secondly, the relation between components of decompositional structure in (2)-(5), (7) is causal, while that in (6) is not. The causal relation in (4), (5), (7) is a relation between events, while CAUSE in (2)-(3) is a two-place sentential operator. Thirdly, and most significantly for the purposes of this paper, (2)-(7) differ as to how many propositional/ eventive components the decompositional structure involves. Ramchand (2003, 2008) suggests that accomplishments consist of three subevents, activity (e_2), process (e_4) and result state (e_5). Other proposals offer different versions of a two-component decomposition. Dowty (1979) and Rappaport Hovav and Levin (1998) assume that the caused component is a state embedded under BECOME, while the causing component is essentially an activity. Kratzer (2000 and elsewhere) suggests that the causing activity and result state are directly connected by CAUSE with no BECOME. Pylkkänen (2002) and Rothstein (2004) develop structures with two eventive components but no result state.

In the literature, one can find extensive evidence showing that accomplishments involve **more than one** component. Essentially, most of this evidence is related to the same general observation: there exist operators that can take scope over one of the components of accomplishment structure, not affecting other component(s). Operators most thoroughly examined in this respect include negation and adverbials like *almost* and *again*. However the question of how many components accomplishments **exactly** have, two or three, has seldom been addressed (unless in relation to the problem of the intermediate scope of *again*, e.g., von Stechow 1996 and Pylkkänen 2002: 102-103).

Given this general background, in what follows I will try to construct a novel empirical argument supporting a rich predicate decomposition along the lines of (7), which is based on evidence from **non-culminating readings** of accomplishment verbs. In a

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[1]The representation in (7) contains equations of the form $e = (e' \rightarrow e'')$. Literally, the left-hand and right-hand parts of the equation do not have matching logical types (e is of type s, $e' \rightarrow e''$ is of type t), so this expression should apparently be interpreted as a shorthand for $e = e' \oplus e'' \wedge e' \rightarrow e''$, where $e' \oplus e''$ is the sum of events e' and e''.

nutshell, I will argue that in a language where accomplishments do not entail culmination (i.e., where sentences like *John opened the door for two hours* 'For two hours, John was involved in opening-the-door activity' are grammatical), the whole range of non-culminating interpretations is adequately accounted for by a three-component decompositional theory. Specifically, two subclasses of accomplishments that differ with respect to non-culmination can be kept distinct if they receive three-component, but not two-component representations.

The rest of the paper is organized as follows. In **Section 2** I introduce data on which the proposal is based. I discuss the phenomenon of non-culmination and observe that non-culminating readings of accomplishments fall into two types which I call failed attempts and partially successful actions. Accordingly, I distinguish between at least two classes of non-culminating accomplishments. In **Section 3**, I develop semantic representations of both types of non-culminating readings within three-component decompositional framework, discussing and rejecting two-component and non-decompositional alternatives. In **Section 4**, main results of Section 3 are implemented within a constructionalist theory of event structure. Finally, **Section 5** offers a few related observations on the lexical semantics of main types of accomplishments discussed in the preceding sections.

2   Non-culminating accomplishments

2.1   Basic examples

The phenomenon of non-culmination can be illustrated by examples like (8a-b) from Karachay-Balkar, a Turkic language spoken in the Caucasus.[2]

(8)   a.   kerim eki minut-xa   ešik-ni   ac-xan-dɨ.
           Kerim two minute-DAT door-ACC open-PFCT-3SG
           'Kerim opened the door in two minutes.'

      b.   kerim eki saʁat ešik-ni   ac-xan-dɨ.
           Kerim two hour door-ACC open-PFCT-3SG
           'Kerim tried to open the door for two hours'
           (lit. 'Kerim opened the door for two hours.')

As the examples in (8) illustrate, Balkar differs from languages like English in that accomplishment predicates like 'open the door' can yield two interpretations. (8a) accepts a time span adverbial, hence is telic: the opening event culminates, and the theme argument enters the result state of being open. For *Kerim opened the door*, the English counterpart of (8), this is the only available interpretation. But *ešik-ni ac-* 'open the door' in Balkar allows for another interpretation, not attested in English, as illustrated in (8b). (8b) is compatible with a measure adverbial 'for two hours', so to the extent that this co-occurrence restriction is characteristic of atelic predicates, (8b) is atelic. The event referred to in (8b) does not culminate, and all (8b) indicates is that

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[2]In the literature, a variety of other languages are mentioned in which accomplishment verbs do not entail culmination (see Ikegami 1985, Koenig and Muansuwan 2001, Tatevosov 2002, Bar-el et al. 2005, Bar-el 2006, Ivanov and Tatevosov, to appear).

the Agent performs activity that aims at changing a state of the Theme. However, this activity terminates before the culmination.

Not surprisingly, given (8b), accomplishment sentences in Balkar are positive with respect to any other tests indicating explicitly that the culmination is not attained:

(9) kerim ešik-ni   ac-xan-dɨ,   alaj boša-ma-ʁan-dɨ.
     Kerim door-ACC open-PFCT-3SG but finish-NEG-PFCT-3SG
     Lit. 'Kerim opened the door, but (he) did not finish.'

In (9), the second clause containing the aspectual verb 'finish' is negated, but this does not yield contradiction with the first clause.

The next significant characteristic of sentences like (8b) is that non-culmination does not imply imperfective grammatical (viewpoint) aspect. Right the other way round, clauses containing verbs in the Perfect form are perfective regardless of whether eventualities referred to culminate or not:

(10) a. men kel-gen-de   kerim (on minut-xa) ešik-ni   ac-xan-dɨ.
          I   come-PFCT-TEMP Kerim ten minute-DAT door-ACC open-PFCT-3SG
          1. 'When I came, Kerim opened the door (in ten minutes).'
          2. *'When I came, Kerim was opening the door'
      b. men kel-gen-de   kerim (on minut) ešik-ni   ac-xan-dɨ.
          I   come-PFCT-TEMP Kerim ten hour   door-ACC open-PFCT-3SG
          1. 'When I came, Kerim spent ten minutes trying to open the door.'
          2. *'When I came, Kerim was opening the door'

(10a-b) do not support interpretations in (10a.2) and (10b.2) in which the running time of the opening event includes that of the coming event referred to by the adverbial clause. (10a-b) are only true if coming temporally precedes opening, as in (10a.1) and (10b.1). This could not have been the case if the imperfective/progressive grammatical aspect were a part of the meaning of the main clause. In contrast, temporal sequencing of events in (10) follows naturally if *ac-xan-dɨ* 'opened' is perfective.

Bar-el et al. (2005) independently make a similar point about non-culminating predicates in St'át'imcets: the authors show that they possess perfective grammatical aspect whereby the running time of an event is included into the reference time.

These observations strongly suggest that non-culmination is distinct from imperfectivity and cannot be reduced to it. If one assumes a conceptual distinction between grammatical aspect and eventuality type, as commonly done within two-component theories of aspect (e.g., Smith 1991/1997, cf. also Depraetere 1995), non-culmination must be a part of the computation of eventuality type, not of grammatical aspect. As soon as a non-culminating eventuality description is built, it can serve as the input to the perfective aspectual operator yielding perfective non-culminating clauses like (8b), (9), and (10b). In what follows, I will pursue exactly this type of approach.

Finally, it is worth noting that the non-culminating interpretation is not restricted to the verbal form of Perfect in (8b) and (9)[3] but is readily available for any form in-

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[3]I follow the practice established by Comrie (1976) in capitalizing labels for language-specific categories. Labels for corresponding semantic entities come without capitalization. Hence "Perfect" refers to a particular verb form in –ʁan in Balkar, while "perfect" is taken to denote a (cross-linguistic) semantic category. Language-specific "Perfects" need not necessarily express the perfect meaning: labels like this may only reflect nothing but a traditional way to refer to a particular verb form in reference grammars.

volving perfective viewpoint aspect. (11a-b) illustrate this for the Preterite and Simple Future of *ac* 'open', respectively.

(11) a. kerim eki saʁat ešik-ni   ac-tɨ.
          Kerim two hour door-ACC open-PST.3SG
          Lit. 'Kerim opened the door for two hours.'

      b. kerim eki saʁat ešik-ni   ac-ar-dɨ.
          Kerim two hour door-ACC open-FUT-3SG
          Lit. 'Kerim will open the door for two hours.'

(11a-b) strongly suggest that it is not specific semantic characteristics of Perfect/Preterite/Simple Future[4] that are responsible for the non-culminating interpretation. Rather, what makes this interpretation possible should exist at the level of uninflected *v*P/VP where the eventuality type of a predicate is computed, before functional structure hosting inflectional morphemes is projected. I will return to this issue shortly, but first a finer look at the non-culminating interpretation is due.

2.2 Failed attempts and partially successful actions

In this section I will make two main observations. First, non-culminating interpretations fall into two types which I will refer to as failed attempt (FA) and partial success (PS) interpretations. Secondly, accomplishment verbs differ as to whether they only license FA, or both FA and PS.[5]

What we see in (8b) is an activity that terminates producing no change in the theme at all: attempts to make the theme enter a new state fail completely, hence the term failed attempt. Another accomplishment that patterns with 'open a door' is 'tear a thread' in (12).

(12) fatima eki minut xalɨ-nɨ   zɨrt-xan-dɨ.
      Fatima two minute thread-ACC tear-PFCT-3SG
      'Fatima tried to tear a thread for two minutes.'
      (lit. Fatima tore a thread for two minutes.)

Let us look at two tearing scenarios in (13):

(13) Scenarios for (12):

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[4]Perfect in *-ʁan* in Balkar does not contrast with Preterite in *-dɨ* as to the tests distinguishing perfects and past perfectives/simple pasts (for further details see Lyutikova et al. 2006). Specifically, Perfect accepts temporal adverbials ('At two o'clock, Kerim open-PFCT the door') and is readily available in the main line of narratives (Kibrik 2002). Overall, Perfect is much more frequent than Preterite, the latter being mostly used as a narrative tense for historical narratives and fairy tales. Apparently, this distribution is an outcome of the diachronic development extensively discussed in typological literature (e.g., Bybee et al. 1994): there is a path of development "perfect → perfective past → simple past", and Perfect in Balkar has developed along this path, entering (and winning) the competition with the older simple past category, Preterite. Therefore, the grammatical system of Balkar is comparable to that of French with its Passé Simple/Passé composé distinction. The similar development of the Perfect in *–gan* is attested in a wide variety of other Kypchak Turkic languages, especially in Siberian Turkic, e.g., Ojrot.

[5]In section 5.1 we will discuss a class of verbs that only license the PS interpretation. These verbs are not directly relevant for the argument developed in sections 3-4, however.

a. **Failed attempt**: For two minutes, Fatima was trying to tear a thread, but the thread was so firm that she was unable to tear it.

b. ****Partial success**: For two minutes, Fatima was tearing a thread, so when she stopped, the thread was partly torn.

Speakers' judgments about (12) are pretty clear: the non-culminating reading in (12) implies the **failed attempt scenario** in (13a) where no process in the thread occurs. The **partial success scenario** in (13b) whereby the thread undergoes some change yet not attaining the state of being torn does not correspond to a possible tearing event. Therefore, accomplishments like 'tear' and 'open', when referring to a non-culminating eventuality, only allow for the failed attempt interpretation. Verbs like these will be referred to as **failed attempt verbs** (FA-verbs) hereafter.

Verbs like *oj* 'destroy, crumble, take down, demolish' are different: they accept both the failed attempt and partial success scenarios, as shown in (14)-(15):

(14) išci   eki kün üj-nü   oj-ʁan-dɨ.
      worker two day house-ACC demolish-PFCT-3SG
      'The worker was involved in taking down the house for two days.' (lit. 'The worker took down the house for two days.')

(15) Scenarios for (14):
      a. **Failed attempt**: For two days, the worker was trying to took down the house, but the house was so firm that he gave up, not being able to remove a single brick.
      b. **Partial success**: For two days, the worker was taking down the house; he removed the roof and one of the walls, but then was asked to stop.

On the partial success scenario in (15b), the event does not culminate, but in a strikingly different way than in (15a): the theme is not completely destroyed when the event terminates, but it definitely undergoes some change. From now on verbs like *oj* 'demolish, take down, crumble' which are compatible with the partial success scenario, will be referred to as **partial success verbs**, or **PS-verbs**.

For PS-verbs like *oj*, it is the context that determines what kind of non-culminating interpretation we get. Imagine a big medieval house made of huge heavy rocks and a worker only equipped with a pickax. Here we are most likely to get (15a). If, on the other hand, the house is a small shack and the worker came with a pneumatic chipper, (15b) would be most probable. Crucially, FA-verbs are not dependent on the context in a comparable way: no kind of context can improve (12) under the partial success scenario.

Finally, it should be pointed out that the FA/PS contrast is not an accidental property of individual lexical entries like 'open' and 'tear' vs. 'crumble, demolish': it is characteristic of the whole class of accomplishment predicates. A few more instances of each class come in (16):

(16) a. PS-verbs: *buz* 'spoil', *quj* 'pour out', *soz* 'stretch', *tazala* 'clean', *tög* 'spill out',...
      b. FA-verbs: *ac* 'open', *ij* 'untie, release', *ujat* 'wake up', *sɨndɨr* 'break',...

Let us take stock of what we have observed so far. There are languages where accomplishment predicates do not entail culmination, and Karachay-Balkar is among them. In such languages, two types of non-culminating readings are available: the partial success reading whereby the theme undergoes a distinguishable change before the eventuality terminates, and the failed attempt reading whereby the theme undergoes no change at all. Accomplishment verbs fall into two classes as to what type of non-culminating readings they produce: FA-verbs, which are only compatible with the failed attempt reading, and PS-verbs, that can also have the partial success reading.[6]

Therefore, empirically, we have two questions to answer. First, how to capture the difference between failed attempt and partial success readings? Secondly, how to account for the difference between FA- and PS-accomplishments? In what follows, I will argue that answers to both questions rely essentially on rich predicate decomposition.

3 Approaching non-culmination

The main intuition that emerges at this point is that accomplishment predicates like 'tear' and 'destroy, take down, crumble' are to be viewed as denoting complex events consisting of a number of subevental components such as the agent's activity, process in the theme and the result state of the theme. Different types of non-culmination, then, can be related to different components. One type, the failed attempt, is, in a sense, an activity-related non-culmination: agent's activity does occur in the actual world, but the rest of the complex eventuality does not. Another type, the partial success, is process-related: the process in the theme induced by the agent's activity does exist in the actual world, but the culmination of this process as well as the result state immediately following the culmination do not. Given that the failed attempt interpretation is available for both PS- and FA-accomplishments listed in (16a-b), the activity-related non-culmination is what they share. In contrast, availability of the process- related non-culmination makes PS-accomplishments in (16a) different from FA-accomplishments in (16b), as represented in (17)-(18):

(17)   FA-accomplishments: Activity –   Process –   Result State
                                   ↑   ⇊
                               Non-culmination   Non-culmination

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[6]In Lyutikova & Tatevosov 2008 we discuss one further grammatical manifestation of PS/FA distinction — the different behavior of these two classes of accomplishments under anticausativization, as exemplified in (i)-(ii):

(i)   *xalɨ eki minut   zɨrt-ɨl-ʁan-dɨ.
        thread two minute-ACC tear-ANTICAUS-PFCT-3SG
        Lit. 'The thread tore for two minutes.'

(ii)   üj   eki zɨl oj-ul-ʁan-dɨ.
        house two year destroy-ANTICAUS-PFCT-3SG
        'The house was decaying for two years.' (lit. 'The house went into ruin for two years.')

Examples in (i)-(ii) indicate that unlike FA-verbs like 'tear', PS-verbs like 'destroy, take down' retain the non-culminating interpretation when anticausativized. Lyutikova and Tatevosov (2008) argue that this contrast can fully be reduced to different event structures of FA- and PS-accomplishments, hence accounted for.

(18) PS-accomplishments: Activity –   Process –   Result State

↑   ↑

Non-culmination   Non-culmination

The above informal outline of the analysis is summarized in (19):

(19) PRELIMINARY HYPOTHESIS

 a. Accomplishment predicates possess distinct meaning components to which failed attempt and partial success readings are related. Those are activity and process subevents of a complex event referred to by the predicate.

 b. The failed attempt is an activity-related non-culmination, available for both PS and FA-accomplishments. PS and FA-accomplishments differ as to whether they are associated with the process-related non-culmination responsible for the partial success interpretation.

In the subsequent sections, I will present this line of reasoning in more detail. But first an overview of a few current approaches to non-culmination is due.

3.1 The partitive theory

Non-culmination phenomena receive growing attention in the literature. The vast majority of current proposals in the field are spelled out within what I call a partitive approach to non-culmination. Different versions of this approach share the same basic intuition: events referred to by non-culminating accomplishments are parts or stages of events from the denotation of culminating ones. Non-culminating predicates, in other words, denote events not 'developed' enough to yield culmination. Take 'take down a house' from (14) as an example. The complete event of taking down a house involves an agent's activity, a corresponding process in the theme, and a result state of the theme being demolished. (14), however, describes a «smaller» eventuality whereby the agent does not produce sufficient efforts to bring about change in the theme, or the house does not undergo sufficient change to count as a destroyed one. Up to some point, complete and incomplete eventualities develop in exactly the same way, and the difference between them has to do with the fact that the latter stop at that point, while the former reach culmination.

 One specific realization of this approach is offered by Krifka (1998) who suggests in his brief comment on the semantics of measure adverbials like *for an hour* that in order to accept such adverbials a quantized (i.e., telic) predicate can be 'coerced' into an "imperfective" interpretation. Krifka defines the "imperfective" version of an event predicate *P* as a predicate that applies to events *e'* iff there is an event *e* such that *P(e)*, and $e' < e$.

(20) $\forall P \forall e'[\text{Ipfv}(P)(e') \leftrightarrow \exists e[P(e) \wedge e' < e]],$ where $<$ is a proper part relation.

 Application of Ipfv to a predicate *P* creates an event predicate that denotes parts of an event from the original extension of *P*. One can easily check that this new predicate is not quantized, hence not telic, and can thus be combined with measure adverbials like *for an hour*. This is a welcome prediction of the theory, because it is exactly

what happens with all non-culminating accomplishments discussed above, regardless of whether they refer to failed attempts or to partially successful actions.

(20) suggests that non-culminating event predicates denote eventualities that are literally parts of eventualities from corresponding culminating ones. However, this extensional analysis appears to run into a complication familiar from extensional analyses of the progressive. What non-culminating accomplishments and progressives have in common is the Imperfective Paradox: a proposition in, e.g., (8b) can be true in the actual world without a corresponding proposition in (8a) being true. A semantic representation of the non-culminating reading based on (20) fails to capture this characteristic, since a «complete» event, according to (20), must exist in the actual world.

This suggests that main arguments for the intensional analysis of the progressive put forward in Dowty 1977, 1979 as well as in later developments of the intensioanl approach (e.g., Landman 1992, Portner 1998) are applicable to non-culminating accomplishments, too. These (or similar) observations led Koenig and Muansuwan (2001) and Bar-el et al. (2005) to to offer analyses of non-culmination based on inertia worlds. Both proposals rely on the same idea: non-culmination implies that the complete eventuality exists in inertia worlds, that is, in all worlds which are exactly like the given world but where the future course of events develops in ways most compatible with the past course of events, to use Dowty's (1979:128) original formulation.

Specifically, Bar-el et al. (2005) analyze non-culminating event predicates occurring in sentences like (21) as in (22):

(21)   St'át'imcets (Bar-el et al. 2005)

máys-en-lhkan   ti   q'láxan-a, t'u7 cw7aoy t'u7 kw-s
fix-TRANS-1SG.SUBJ DET fence-DET but NEG   just DET-NOM
tsúkw-s-an.
finish-CAUS-1ERG

Lit. 'I fixed the fence, but I didn't finish.'

(22)   The denotation of tenseless and aspectless vP in (21):
|| máys-en-lhkan ti q'láxan-a || ^{w,g} = λe[I am the agent of e in w ∧ e is controlled by me in w ∧ ∀w'[w' is an inertia world w.r.t. w at the beginning of e → ∃e'[the fence gets fixed in w'(e') ∧ e causes e' in w']]]

(22) is (a characteristic function of) a set of events in which the speaker is an agent who exercises control over their development in the actual world. In every inertia world, these events bring about a change of state of the fence, the fence getting fixed.

Koenig and Muansuwan (2001) deal with non-culminating accomplishments in Thai, suggesting that accomplishment verb stems in Thai are fundamentally imperfective. In their system, lexical entries for all accomplishment stems contain a built-in imperfective operator, based the notion of inertia worlds, too.

(23)   Semantics for the imperfective operator (Koenig and Muansuwan 2001).
    a. a. α = Impfv(ev, ϕ)
    b. An eventuality *ev* and an event description ϕ satisfy condition α iff there is an e' which (non-necessarily properly) includes *ev* and satisfies ϕ in all inertia worlds, i. e. in all worlds compatible with what it would mean to complete *ev* without being interrupted.

Accordingly, non-culminating accomplishments would be analyzed as in (24):

(24) $\|$ John open the door $\|^{\,w,\,g}$ =
λe.Impfv(e, λe'[write(e') $\wedge$ agent(John)(e') $\wedge$ theme(door)(e')])

I suggest that an analysis along the lines of (22)-(24) is basically correct but is not sufficient by itself to capture the difference between FA- and PS- accomplishments.[7] In the next section, I will isolate the main problem for non-decompositional analyses like that in (24) as well as for the theories that assume the two-component decomposition, an instance of which is (22).

3.2   Partial success vis-à-vis failed attempt

On the modal approach to non-culmination, the informal notions of failed attempt (=activity-related non-culmination) vs. partial success (=process-related non-culmination) introduced in section 2 can be given the following sense. These two types of non-culmination are different ways of distributing subevental components of accomplishment event structure between the actual and inertia worlds, as represented in Table 1.

	Culminating	Non-culminating	
		partial success	failed attempt
Agent's activity	Actual world	Actual world	Actual world
Process in the Theme	Actual world	Actual world	**Inertia worlds**
Result state	Actual world	**Inertia worlds**	**Inertia worlds**

Table 1. Culminating and non-culminating readings

Table 1 makes the preliminary hypothesis in (19) more explicit. The culminating reading obtains if all the three components of a complex eventuality occur in the actual world. Accordingly, for an eventuality not to culminate means that at least the result state occurs in inertia worlds. The partial success and failed attempt interpretations differ in whether the process in the theme occurs in inertia worlds, too. In this way, Table 1 captures generalizations represented informally in (17)-(18).

The crucial thing to note at this point is that the distribution of subevental components between actual and inertia worlds in Table 1 cannot be easily captured either by Koenig and Muansuwan and Bar-el et al. theories of non-culmination, nor by alternative theories assuming a non-decompositional representation of accomplishments or a two-way predicate decomposition.

To see this, let us first try a non-decompositional theory along the lines of Koenig and Muansuwan (for the sake of simplicity I represent arguments as individual constants, as before). The major complication is that, given (23), PS- and FA-accomplishments are treated on a par, as in (25a-b).

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[7]Below I will not challenge Koenig and Muansuwan (2001) and Bar-el et al.'s (2005) assumption that non-culmination has to do with inertia worlds. I am aware of a variety of problems this notion introduces into the analysis of the progressive, of course. Given parallelism between non-culminating and progressive interpretations, refinements of the analysis along the lines of Landman 1992 or Portner 1998 may be in order. However, I believe that nothing in the below line of reasoning relies on any specific assumptions about what the modal analysis has to look like. It should be compatible with whatever reasonable modal theory solving the imperfective paradox.

(25) a. || John tear the thread ||$^{w, g}$
       = λe.Impfv(e, λe'[tear (e') $\wedge$ agent(John)(e') $\wedge$ theme(thead)(e')])

     b. || John take down the house ||$^{w, g}$
       = λe.Impfv(e, λe'[demolish (e') $\wedge$ agent(John)(e') $\wedge$ theme(house)(e')])

Under the non-decompositional analysis in (25a-b), events accomplishments denote are conceived of as an indivisible whole. Neither (25a) nor (25b) separate activity performed by the external argument and change of state undergone by the internal argument. As a consequence, (25a-b) do not impose any explicit restrictions on how activity is related to the change of state.

Therefore, the denotation of event predicates like *P = λe'[demolish (e') $\wedge$ agent(John)(e') $\wedge$ theme(house)(e')]* would contain different kinds of demolishing events. First, those will be events of "gradual destruction" in which the agent's activity induces a gradual change in the house such that the house finally enters the result state of being destroyed. Secondly, *P* will also denote events of "instant destruction" in which all the change of state occurs at the minimal final part of the activity, while non-final parts of the activity bring about no identifiable change of the house at all. (Imagine a worker equipped with a chopper who crashes a supporting wall for a certain time. At some point, the wall collapses all at once, and the house immediately collapses, too).

Applying Impfv to *P* in (25b) extracts (non-final) parts of events from the denotation of *P* and "moves" the remainder to inertia worlds.[8] It is not difficult to see that extracted parts denoted by (25b) will be different for the above two kinds of demolishing events. Parts of events of "gradual destruction" still involve some agent's activity and some change in the theme. This is, of course, the partial success reading discussed above. On the other hand, parts of events of "instant destruction" are those in which only agent's activity is going on: since the change of state occurs at the minimal final part of the event, and we are dealing with its proper non-final parts, the whole change of state will be forced out from the actual world. It is in this way, one can argue, that the failed attempt interpretation emerges.

The crucial problem, then, is that there is no principled explanation for why exactly the same possibilities are not available for the identical event predicate in (25a). Specifically, why should tearing events in (25a) be incompatible with the "gradual tearing" scenario whereby the agent tears a thread gradually, parts of the change of state being mapped onto parts of the activity? Common sense suggests that this would not be a possible tearing event, and (12)-(13) show that the partial success interpretation is not in fact available for 'tear a thread', but (25) where 'tear' and 'demolish' are analyzed in the same way do not tell us why this should be the case. PS- and FA- accomplishments are therefore not distinguished by the non-decompositional analysis.

Now consider Bar-el et al.'s decompositional analysis in (26). In (26), the overall eventuality is analyzed as consisting of the agent's activity and the change of state of the theme:

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[8]K&M use a part relation "$\leq$", not a proper part relation "$<$" in the semantic representation of Impfv to allow a predicate denote eventualities that culminate in the actual world. For the sake of argument I focus on the case where extracted parts are *proper* non-final parts of events from the denotation of *P* and ignore the case of identity, irrelevant for the argument.

(26) a. || John tear the thread ||^{w,g} = λe[agent(John)(e) in w $\wedge$ e is controlled by
John in w $\wedge$ $\forall$w'[w' is an inertia world w.r.t. w at the beginning of e $\rightarrow$
$\exists$e'[tear(thread)(e') in w' $\wedge$ cause(e')(e) in w']]]

b. || John take down the house ||^{w,g} = λe[agent(John)(e) in w $\wedge$ e is controlled
by John in w $\wedge$ $\forall$w'[w' is an inertia world w.r.t. w at the beginning of e $\rightarrow$
$\exists$e'[get.destroyed(house)(e') in w' $\wedge$ cause(e')(e) in w']]]

Under this analysis, uninflected *v*Ps [*John tear the thread*] and [*John take down the house*] denote events in the actual world in which John is the agent who exercises control over their development. In all inertia worlds, these events bring about the change of state of the theme, the thread getting torn, the house getting destroyed.

The problem of inseparability of PS- and FA-accomplishments we encountered above is still here, however. Let us take a closer look at the range of interpretations (26a-b) could have. Most obviously, one of these interpretations is a failed attempt: it obtains if the agent activity occurs in the actual world, whereas the rest of eventuality does not. (26a-b) therefore, correctly predict that both types of accomplishments do allow for this interpretation.

Both (26a-b), then, allow events to culminate in the actual world. This happens because Bar-el. et al. define inertia worlds with respect to the beginning of the activity. As a consequence, the actual world as it is happens to be at the end of the activity can (although need not) be identical to one of those inertia worlds, and this is how the culminating interpretation obtains.

The problem, then, still has to do with the partial success interpretation. Suppose that at the end of the activity the event did not culminate (i.e. the actual world is not in the set of inertia worlds defined with respect to the beginning of the activity). Nothing in (26a-b) suggests, however, that in such a case no process in the theme is possible. For instance, (26b) only entails that in the actual world the proposition $\exists$e'[get.destroyed(house)(e')] does not hold, that is, that the house is not completely destroyed. (26b) thus does not entail that it undergoes no change at all. (26a-b) should therefore both be compatible with the partial success interpretation. Obviously, at this point the same complication as before emerges: we do not want to have a partial success interpretation for FA-accomplishments like 'tear the thread', but the semantic representation in (26) does not offer a natural way of excluding this interpretation. Even worse: if one finds a way to guarantee that that FA-accomplishments do not have the PS-reading, it is not clear how to avoid obtaining the same result for 'take down a house'.

Abandoning the assumption that inertia worlds are defined with respect to the beginning of the activity does not solve the problem. Assume that inertia worlds are identical to the base world up to the moment where the activity stops (cf. Dowty 1979:146):

(27) a. || John tear the thread ||^{w,g} = λe[agent(John)(e) in w $\wedge$ e is controlled by John
in w $\wedge$ $\forall$w'[w' is an inertia world w.r.t. w at the end of e $\rightarrow$
$\exists$e'$\exists$e"[tear(thread)(e") in w' $\wedge$ cause(e")(e') in w' $\wedge$ e < e' in w']]]

b. || John take down the house ||^{w,g} = λe[agent(John)(e) in w $\wedge$ e is controlled
by John in w $\wedge$ $\forall$w'[w' is an inertia world w.r.t. w at the end of e $\rightarrow$
$\exists$e'$\exists$e"[get.destroyed(house)(e") in w' $\wedge$ cause(e")(e') in w' $\wedge$ e < e' in w']]]

(27a-b) denote agent's activities *e* occurring in our world. In every inertia world *w'*, identical to our world up to the moment where *e* stops, there is an activity *e'*, of which *e* is a part, and *e'* brings about a change of state, *e''*, in *w'*. In (27a-b), events culminating in the base world are no longer part of the denotation of event predicates, since worlds start branching when the activity stops. Yet, the fact that no process in the theme goes on in the base world is not guaranteed. While it cannot be the case that the house gets destroyed in the actual world, it still can be the case that it undergoes at least some change, and it still is not clear how to get rid of the same possibility for 'tear a thread'.

Generalizing over this case, one can observe that all theories involving two-component decomposition into activity and change of state (e.g., Pylkkänen 2002) inevitably run into the same problem of inseparability.

Let us try another type of the two-way decomposition whereby activity is connected to the result state directly, as in Kratzer 2000.

(28) a. kerim ešik-ni   ac-xan-dɨ.
          Kerim door-ACC open-PFCT-3SG
          'Kerim opened the door.'

  b. Agent's activity vs. result state of the theme, cf. Kratzer 2000
      $\| [_{vP}$ kerim ešik ac-$] \|^{w,g} =$
      $\lambda e \exists s[\text{agent(Kerim)}(e) \wedge \text{opening}(e) \wedge \textbf{open S(door)}(s) \wedge \text{cause}(s)(e)]$
      where **open$_s$** is a predicate denoting states of being open.

Now consider non-culminating versions of *John tear the thread* and *John take down the house*:

(29) Agent's activity vs. result state of the theme

  a. $\| [_{vP}$ fatima xalɨ zɨrt-$] \|^{w,g} = \lambda e[\text{agent(fatima)}(e)$ in w $\wedge$ tear(e) in w $\wedge \forall w'[w'$ is an i-world w.r.t. w at the end of e $\rightarrow \exists e' \exists s[\text{torn}_s(\text{thread})(s)$ in w' $\wedge \text{cause}(s)(e')$ in w' $\wedge e < e'$ in w']]]

  b. $\| [_{vP}$ išci üj oj-$] \|^{w,g} = \lambda e[\text{agent(worker)}(e)$ in w $\wedge$ demolishing(e) in w $\wedge \forall w'[w'$ is an i-world w.r.t. w at the end of e $\rightarrow \exists e' \exists s[\text{demolished}_s(\text{house})(s)$ in w' $\wedge \text{cause}(s)(e')$ in w' $\wedge e < e'$ in w']]]

(29a-b) differ from (27a-b) in that the second subevental component of a complex eventuality is a state, not a change of state. (29a-b) do not make explicit if any process happens to the theme in the actual world. Since for (29) it is only obligatory that the result state occurs in inertia worlds, (29a-b) would again be compatible with both failed attempt and partial success scenarios. As a result, if, according to (29), the partial success reading is available for *oj*, the same should hold for *zɨrt*.

To sum up, whatever strategy we adopt, the distribution in Table 1 cannot be derived, because FA-verbs like *zɨrt* 'tear' and PS-verbs like *oj* 'demolish, take down, crumble' are inevitably treated on a par: both are predicted to be compatible with both FA- and PS- readings. As we saw earlier, this prediction is not borne out.

Given the above observations, the source of the complication seems to be clear: the partial success and failed attempt interpretations are not distinguished explicitly by different semantic representations. They both "live" within the same event predicate, either non-decompositional, as in (25), or involving two-component decomposition,

as in (26), (27), (29). Therefore, neither analysis is able to capture the difference between failed attempt and partial success interpretations, hence between PA- and PS-verbs: these versions of the theory do not provide us with enough subevental structure.

3.3 Three-way decomposition

If, as I tried to show, the problem of inseparability has to do with the insufficient subevental structure, what we need is a more articulated predicate decomposition, making explicit a three-way distinction between activity, process and result state. With such a distinction, complications discussed in the previous section do not emerge. Most significantly, the difference between two non-culminating readings of the PS-accomplishment *oj* can be represented as in (30)-(31).

(30) Failed attempt
$\| [_{vP} \text{ išci üj oj-}] \|^{w,g} = \lambda e$ [agent(worker)(e) in w $\wedge$ demolish$_A$(e) in w $\wedge$ $\forall$w'[w' is an i-world for w w.r.t. e $\rightarrow$ $\exists$e'$\exists$e''$\exists$s[demolish$_P$(house)(e'') in w' $\wedge$ cause(e'')(e') in w' $\wedge$ e < e' in w' $\wedge$ demolish$_R$(house)(s) in w' $\wedge$ cause(s)(e'') in w']]]
where *demolish$_A$, demolish$_P$*, and *demolish$_S$* denote demolishing activities, processes of getting demolished, and states of being demolished, respectively.

(30) denotes the agent's demolishing activities occurring in the actual world. In all inertia worlds, the agent's activity causes a process of destruction in the theme that leads to a result state of being destroyed.

(31) Partial success
$\| [_{vP} \text{ išci üj oj-}] \|^{w,g} = \lambda e \exists e'$[agent(worker)(e) in w $\wedge$ demolish$_A$(e) in w $\wedge$ demolish$_P$(house)(e') in w $\wedge$ cause(e')(e) in w $\wedge$ $\forall$w'[w' is an i-world for w w.r.t. e' $\rightarrow$ $\exists$e''$\exists$s [demolish$_S$(house)(s) in w' $\wedge$ cause(s)(e'') in w' $\wedge$ e' < e'' in w']]]

(31) denotes the agent's demolishing activities that cause a process of destruction in the theme in the actual world. In all inertia worlds, this process leads to a result state of being destroyed.

In representations in (30)-(31) the difference between FA-verbs and PS-verbs is fully revealed: on the non-culminating interpretation, uninflected vPs based on FA-verbs can only denote events that do not cause any process in the theme in the actual world:

(32) Failed attempt
$\| [_{vP} \text{ fatima xalɨ zɨrt-}] \|^{w,g} = \lambda e$ [agent(fatima)(e) in w $\wedge$ tear$_A$(e) in w $\wedge$ $\forall$w'[w' is an inertia world for w w.r.t. e $\rightarrow$ $\exists$e'$\exists$e''$\exists$s[tear$_P$(thread)(e'') in w' $\wedge$ cause(e'')(e') in w' $\wedge$ e < e' in w' $\wedge$ tear$_R$(thread)(s) in w' $\wedge$ cause(s)(e'') in w']]]

(32) denotes the agent's tearing activities occurring in the actual world. In all inertia worlds, these activities cause a tearing process in the theme that leads to a result state of being torn. In contrast, events in which the agent's activity brings about the process in the theme in the actual worlds, with the culmination of this process as well as a subsequent result state only being moved to inertia worlds, do not fall under the denotation of vP [Fatima tear a thread]:[9]

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[9]The CSSP anonymous reviewer has suggested that a possible alternative to the analysis in (30)-(33) can look as follows. Whereas the event structure of predicates 'take down the house', which do distin-

(33) *Partial success: not available

$\lambda e \exists e'$[agent(fatima)(e) in w $\wedge$ tear$_A$(e) in w $\wedge$ tear$_P$(thread)(e') in w $\wedge$ cause(e')(e) in w $\wedge$ $\forall w'$[w' is an inertia world for w w.r.t. e$\rightarrow$ $\exists e''\exists s$ [tear$_S$(thread)(s) in w' $\wedge$ e' < e'' in w' $\wedge$ cause(s)(e') in w']]] $\not\in$ || [$_{vP}$ fatima xalɨ zɨrt-] ||$^{w, g}$

As is clear from (30)-(33), non-culmination can be introduced at different levels of subevental structure. For the failed attempt interpretation, it is a level of agent's activity, with all the rest being removed to inertia worlds. For the partial success it is a level of a process the theme undergoes, with the result state only being forced out from the actual world. In this way, the distribution in Table 1 is captured, and the first part of the preliminary hypothesis in (19) is made explicit: the failed attempt in (30) and (32) is treated as an activity-related non-culmination, while the partial success in (31) comes out as a process-related non-culmination.

I am in a position of summarizing main results of this section. Partially successful actions differ from failed attempts in how parts of eventualities are distributed between the actual and inertia worlds. This difference is successfully captured by the three-component decomposition into activity, process, and result state subevents, but not by the twocomponent decomposition, nor by a non-decompositional theory. The partial success reading obtains if the result state is attained in inertia worlds, but two other subevents occur in the actual world. The failed attempt reading obtains if both the process and result state occur in inertia worlds, while the activity still occurs in the actual world. Therefore, if an overall eventuality consists of three subevents, the difference boils down to whether a process subevent occurs in the actual world. Finally, FA-verbs are only associated with the activity-related non-culmination; for PS-verbs both sources are available.

So far, semantic representations of different readings of *v*Ps containing FA- and PS-verbs are provided but not compositionally derived. This task is accomplished in the next section.

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guish between PS and FA readings, consists of three subevents, as in (30)-(31), that of predicates like 'tear a thread', which only allow for one non-culminating interpretation, is simpler: it contains two subevents, hence only one possible source of non-culmination. In such a system the number of non-culminating interpretations reflect the number of subeventual components directly. I have two reasons to believe that the analysis of in (30)-(33) is more tenable. Firstly, if predicates like 'tear a thread' undergo two-component decomposition, the problem discussed in section 3.2 re-emerges. For a single non-culminating interpretation one gets event predicates either like (i) (cf. 27a) or like (ii) (cf. 29a), but neither tells us why this single interpretation is a failed attempt but not a partial success:

(i) a. || [$_{vP}$ fatima xalɨ zɨrt-] ||$^{w, g}$ = λe[agent(fatima)(e) in w $\wedge$ tear$_A$(e) in w $\wedge$ $\forall w'$[w' is an i-world w.r.t. w at the end of e $\rightarrow$ $\exists e'\exists e''$[tear$_P$(thread)(e'') in w' $\wedge$ cause(e'')(e') in w' $\wedge$ e < e' in w']]]

b. || [$_{vP}$ fatima xalɨ zɨrt-] ||$^{w, g}$ = λe[agent(fatima)(e) in w $\wedge$ tear$_A$(e) in w $\wedge$ $\forall w'$[w' is an i-world w.r.t. w at the end of e $\rightarrow$ $\exists e'\exists s$[torn$_S$(thread)(s) in w' $\wedge$ cause(s)(e') in w' $\wedge$ e < e' in w']]]

Secondly, putting non-culminating phenomena aside, accomplishments like 'tear a thread' and 'take down a house' pattern together as to a bulk of other semantic and syntactic characteristics (Lyutikova & Tatevosov 2008). Assuming that they are associated with different subeventual structure would inevitable miss a number of generalizations about this parallelism.

4 Implementation: a constructionalist approach

At the moment, the only fully elaborated theory I am aware of that relies explicitly on the three-component decomposition is Ramchand's (2002, 2003, 2008 and elsewhere) First Phase Syntax. In what follows, I build on and extend this theory by incorporating non-culminating eventive heads into syntactic representations.

4.1 Event structure

Ramchand assumes a radical constructionalist approach whereby the whole event structure is built syntactically, with no independent level(s) identical or comparable to lexical conceptual structure, argument structure or so. All information an individual lexical item carries is that about syntactic heads projected by that item within the vP phase. Interpretation of the event structure is determined by syntactic heads themselves: v introduces an initiation/activity subevent, V refers to a process induced by that activity, and R(esult) head denotes the result state bought about by the process. Thematic relations arguments in the specifier positions of v, V, and R bear to corresponding subevents are fully determined by their structural position: Spec, vP is a position of the initiator of the activity, spec, VP is where the undergoer of the process is located, and the spec, RP position is automatically interpreted as hosting the holder of result state. The overall architecture of the articulated vP is represented in (34):

(34)
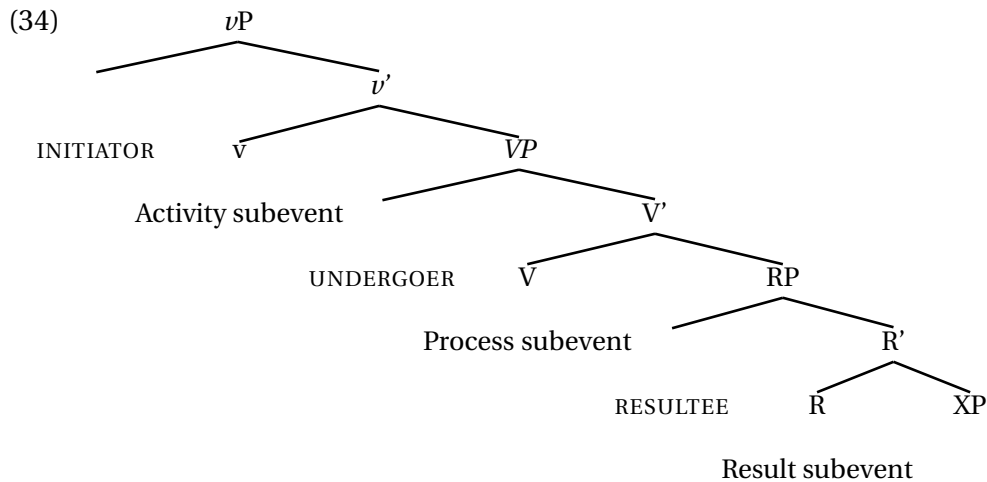
Ramchand's (2002, 2003, 2008) semantics for v, V, and R heads is given in (35a-c) with minor simplifications and adjustments:

(35) a. $\| v \| = \lambda P \lambda x \lambda e \exists e'\ [\mathbf{v}(e) \wedge \text{initiator}(x)(e) \wedge \text{cause}(e')(e) \wedge P(e')]$

   b. $\| V \| = \lambda P \lambda x \lambda e \exists s[\mathbf{V}(e) \wedge \text{undergoer}(x)(e) \wedge \text{cause}(s)(e) \wedge P(s)\ ]$

   c. $\| R \| = \lambda x \lambda s[\mathbf{R}(s) \wedge \text{resultee}(x)(s)]$
       where **v**, **V**, and **R** are event predicates associated with a given head by the Encyclopedia, and *P* is an event predicate denoted by its complement.

Examples of individual lexical entries are shown in (36), where coindexation of heads indicates that they share a participant:

(36) a. defuse: $[v, V_i, R_i]$

    b. push: [v, V]

    c. dance: [v_i, V_i]

Thus, for instance, *push* is a transitive activity verb that projects an activity event structure consisting of two subevents, activity and process, with two distinct arguments, initiator and undergoer. *Dance* creates the same event structure, the only difference being that the initiator of the activity and undergoer of the process are identical, hence the event structure is unergative. Finally, encyclopedia entries associated with lexical items like those in (36) provide descriptive content for the event structure, that is, specify event predicates involved in the interpretation (**v**, **V** and **R** in (35)).

Accomplishment verbs like 'tear' or 'destroy' are all [v, V_i, R_i] in this system. For culminating clauses like (37a) and (38a), projecting vP, saturating all argument positions, and combining denotations of eventive heads and their complements via functional application yields event predicates in (37b) and (38b).

(37) a. alim üj-nü   oj-ʁan-dɨ.
          Alim house-ACC demolish-PFCT-3SG
          'Alim took down the house.'

      b. $\| [_{v\text{P}}$ Alim take down house] $\| = \lambda e \exists e' \exists s [\text{demolish}_A(e) \wedge \text{initiator}(\text{Alim})(e) \wedge \text{cause}(e')(e) \wedge \text{demolish}_P(e') \wedge \text{undergoer}(\text{house})(e') \wedge \text{cause}(s)(e') \wedge \text{demolish}_S(s) \wedge \text{resultee}(\text{house})(s)]]$

(38) a. alim xalɨ-nɨ   zɨrt-xan-dɨ.
          Alim thread-ACC tear-PFCT-3SG
          'Alim tore a thread'

      b. $\| [_{v\text{P}}$ Alim tear thread] $\| = \lambda e \exists e' \exists s [\text{tear}_A(e) \wedge \text{initiator}(\text{Alim})(e) \wedge \text{cause}(e')(e) \wedge \text{tear}_P(e') \wedge \text{undergoer}(\text{thread})(e') \wedge \text{cause}(s)(e') \wedge \text{tear}_S(s) \wedge \text{resultee}(\text{thread})(s)]$

(37b) and (38b) only derive the culminating interpretation, however. To account for the non-culmination the theory is to be extended in a way compatible with the generalizations in (19) and results of section 2.

4.2 Non-culminating eventive heads

I see two possible directions to take at this juncture. First, one can assume that activity-related and process-related non-culmination is introduced by an operator *Op* that adjoins VP and RP respectively:

(39) a. Activity-related non-culmination (failed attempt):
         $[_{v\text{P}} \ldots \text{v} \ldots [_{\text{VP}} \text{Op} [_{\text{VP}} \ldots \text{V} \ldots [_{\text{RP}} \ldots \text{R} \ldots]]]$

      b. Process-related non-culmination (partial success):
         $[_{v\text{P}} \ldots \text{v} \ldots [_{\text{VP}} \ldots \text{V} \ldots [_{\text{RP}} \text{Op} [_{\text{RP}} \ldots \text{R} \ldots]]]$

(40) $\| \text{Op} \| = \lambda P \lambda e.\text{IM}(P)(e)$
      where IM is an inertia modality, a relation between event predicates and events such that $\| \text{IM}(P)(e) \|^{w, g} = 1$ iff in all inertia worlds w' for w w.r.t. e there is an eventuality(event or state) e' such that e causes e' and e' satisfies the event description *P* in w'.

In such a system, languages that allow for non-culminating accomplishments differ from languages that do not in that the former but non the latter possess a modifier *Op.* There is a problem with this approach, however. Look at the derivation of the process-related non-culmination in (41). If RP denotes a property of states like that in (41a), adjoining *Op* to RP yields an event predicate in (41b):

(41) a. $\| [_{RP} \text{ destroy the house}] \|^{w,g} = \lambda s[\text{destroy}_S(s) \wedge \text{resultee(the house)}(s)]$

  b. $\| [_{RP} \text{ Op } [_{RP} \text{ destroy the house}]] \|^{w,g} = \lambda e.\text{IM}(\lambda s[\text{destroy}_S(s) \wedge \text{resultee(the house)}(s)])(e)$

Merging V with RP in (41b) and applying the denotation of V in (35b) to the denotation of that RP creates an event predicate in (42). (42) is clearly not a kind of semantic representation we would like to derive, since it contains, given semantics of IM in (40), one extra subevent and one extra cause relation. We need rather something like (43), but then we have, first, to modify $\| V \|$ as in (44), and, secondly, to combine V with RP in (41b) by conjunction:

(42) $\| [_{V'} \text{ V } [_{RP} \text{ Op RP}]] = \lambda x\lambda e\exists e'[\text{destroy}_P(e) \wedge \text{undergoer}(x)(e) \wedge \text{cause}(e')(e) \wedge \text{IM}(\lambda s[\text{destroy}_S(s) \wedge \text{resultee(the house)}(s)])(e')]$

(43) $\| [_{V'} \text{ V } [_{RP} \text{ Op RP}]] = \lambda x\lambda e[\text{destroy}_P(e) \wedge \text{undergoer}(x)(e) \wedge \text{IM}(\lambda s[\text{destroy}_S(s) \wedge \text{resultee(the house)}(s)])(e)]$

(44) $\| V \| = \lambda x\lambda e[\text{destroy}_P(e) \wedge \text{undergoer}(x)(e)]$

Therefore, having assumed an adjunction approach, we end up by having different semantic representations for eventive heads entering derivations of culminating and non-culminating event structures. The source of this complication is clear: whereas in a culminating structure (e.g., (37b)) the cause relation of a higher subevent to an embedded subevent is introduced by the head itself (as, e.g., in (35b)), in non-culminating structures it has to fall under the scope of inertia modality operator, hence comes out as a part of its denotation. For these reasons, I opt for a different approach: non-culmination is a part of the denotation of eventive heads themselves. v and V thus come in two varieties: culminating, as in (35a-b), and non-culminating, as in (45a-b):

(45) a. $\| v_{\text{inertia}} \|^{w,g} = \lambda P\lambda x\lambda e \, [v'(e) \text{ in } w \wedge \text{initiator}(x)(e) \text{ in } w \wedge \forall w'[w' \text{ is an i-world for } w \text{ w.r.t. } e \rightarrow \exists e' \exists e'' [\text{cause}(e')(e'') \text{ in } w' \wedge e < e'' \text{ in } w' \wedge P(e') \text{ in } w']]]$

  b. $\| V_{\text{inertia}} \|^{w,g} = \lambda P\lambda x\lambda e \, [V'(e) \text{ in } w \wedge \text{undergoer}(x)(e) \text{ in } w \wedge \forall w'[w' \text{ is an i-world for } w \text{ w.r.t. } e \rightarrow \exists e' \exists e''[\text{cause}(e')(e'') \text{ in } w' \wedge e < e'' \text{ in } w' \wedge P(e') \text{ in } w']]]$

In (45a), the denotation of non-culminating v involves the agent's activity occurring in the actual world, while the rest of the eventuality only exists in inertia worlds; in this way, the failed attempt interpretation obtains. V_{inertia} in (45b) introduces the process occurring in the actual world, the result state only being "moved" to inertia worlds. This is represented in (46a-b) where the non-culminating part of the overall eventuality is boxed:

(46) a. failed attempts $[v_{\text{inertia}}, V_i, R_i]$

vP

v_{inertia} VP

V RP

R △
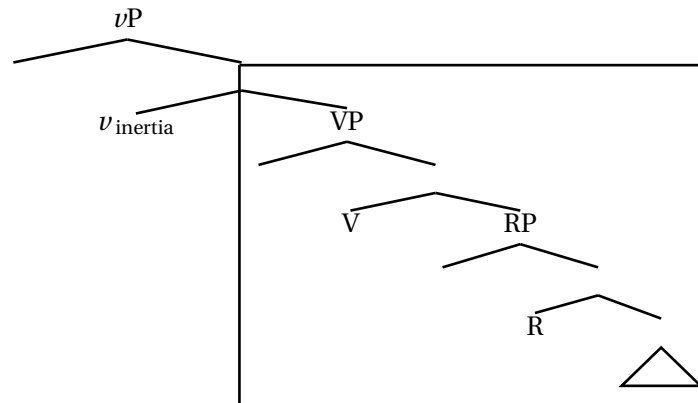
b. partially successful actions $[v, V_{i,\text{inertia}}, R_i]$

vP

v VP

V_{inertia} RP

R △
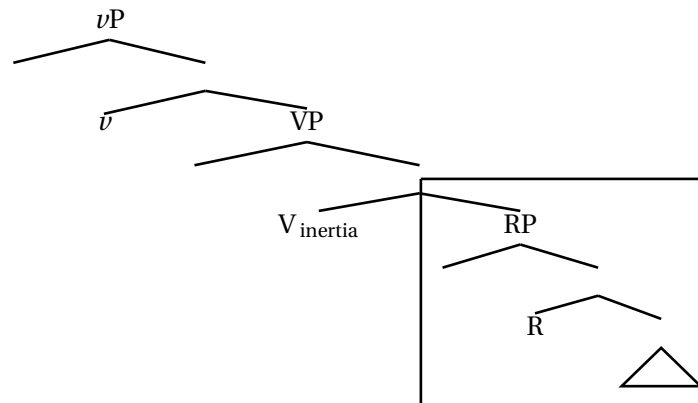
Therefore, the distribution in Table 1 is reduced to different configurations of culminating and non-culminating eventive heads, as represented in Table 2:

	CULMINATING	NON-CULMINATING	
		partial success	failed attempt
Agent's activity	Actual world	Actual world	Actual world
Process in the undergoer	Actual world	Actual world	**Inertia worlds**
Result state	Actual world	**Inertia worlds**	**Inertia worlds**
Event structure	$[v, V_i, R_i]$	$[v, V_{i\,\text{inertia}}, R_i]$	$[v_{\text{inertia}}, V_i, R_i]$

Table 2. Event structures of non-culminating accomplishments

In such a system, languages with non-culminating accomplishments (e.g., Balkar) differ from those without non-culminating accomplishments (e.g., English) as to the vocabulary of eventive heads. This difference is thus rooted at the level where the denotation of event predicates is computed, not at the higher level of aspectual and temporal functional structure. In this way, the present proposal recapitulates the fundamental insight of Koening and Muansuwan's and Bar-el et al.'s approach to non-culmination: the non-culmination is built into the semantics of uninflected verbal predicates before they combine with tense/aspect morphology.

4.3   Representing FA/PS distinction

If (45a-b) are correct, the difference between verbs like *oj* and *zïrt* can be captured by assuming the following lexical specifications:

(47)   a. oj [v $_{(\pm inertia)}$, V $_{i\,(\pm inertia)}$, R $_i$]

      b. zɨrt [v $_{(\pm inertia)}$, V $_{i\,(-inertia)}$, R $_i$]

Given (47a-b), *oj* have two possible sources of non-culmination, v $_{inertia}$ and V $_{inertia}$. For *zɨrt*, the single source, v $_{inertia}$, is only available.

    Semantic representations of two non-culminating readings of *oj* are given in (48b-c); the single non-culminating reading of *zɨrt* is represented in (49b).

(48)   a. išci   eki kün üj-nü   oj-ʁan-dɨ.
         worker two day house-ACC demolish-PFCT-3SG
         'The worker was involved in taking down the house for two days'

      b. [v $_{inertia}$, V $_i$, R $_i$] (failed attempt):
         $\|v\text{P}\|^{w,g} = \lambda e$ [demolish$_A$(e) in w $\wedge$ initiator(worker)(e) in w $\wedge$ $\forall$w'[w' is an i-world for w w.r.t. e $\rightarrow$ $\exists$e' $\exists$e'' $\exists$s[cause(e')(e'') in w' $\wedge$ demolish $_P$(e') in w' $\wedge$ undergoer(house)(e') in w' $\wedge$ e < e'' in w' $\wedge$ cause(s)(e') in w' $\wedge$ demolish $_S$(s) in w' $\wedge$ resultee(house)(s) in w']]]

      c. [v, V $_{inertia\,i}$, R $_i$] (partial success):
         $\|v\text{P}\|^{w,g} = \lambda e\exists e'$[demolish$_A$(e) in w $\wedge$ initiator(worker)(e) in w $\wedge$ cause(e')(e) in w $\wedge$ demolish $_P$(e') in w $\wedge$ undergoer(house)(e') in w $\wedge$ $\forall$w'[w' is an i-world for w w.r.t. e $\rightarrow$ $\exists$e'' $\exists$s [cause(s)(e'') in w' $\wedge$ e' < e'' in w' $\wedge$ demolish $_S$(s) in w' $\wedge$ resultee(house)(s) in w']]]

(49)   a. fatima eki minut xalɨ-nɨ   zɨrt-xan-dɨ.
         Fatima two minute thread-ACC tear-PFCT-3SG
         'Fatima tried to tear a thread for two minutes'

      b. [v $_{inertia}$, V $_i$, R $_i$] (failed attempt):
         $\|v\text{P}\|^{w,g} = \lambda e$ [tear $_A$(e) in w $\wedge$ initiator(fatima)(e) in w $\wedge$ $\forall$w'[w' is an i-world for w w.r.t. e $\rightarrow$ $\exists$e' $\exists$e''$\exists$s[cause(e')(e'') in w' $\wedge$ e < e'' in w'$\wedge$ tear $_P$(e') in w' $\wedge$ undergoer(thread)(e') in w'$\wedge$ cause(s)(e') in w' $\wedge$ tear $_S$(s) in w' $\wedge$ resultee(thread)(s) in w']]]

(48)-(49) account for the range of interpretations of PS- and FA-verbs like *oj* 'demolish, take down, crumble' and *zɨrt* 'tear'.

    Therefore, what accomplishments like 'destroy' or 'tear' in Balkar have in common is that VP can be merged with either v or v $_{inertia}$. What tells them apart is [$\pm$inertia] vs. [-inertia] specifications assigned to the V head.

4.4   Aspectual structure

So far, I have been dealing with uninflected, that is, tensless and aspectless *v*Ps. In fully inflected clauses non-culminating accomplishments occuring in the Perfect/ Prete-rite/Simple Future form (see (8b) and (11a-b)), display perfective grammatical (view-point) aspect. Following much recent literature on aspect, I assume that uniflected *v*Ps merge with the Aspect head creating AspectP, as in (50a); the Aspect head hosts aspectual operators in (50b-c):

(50)   a. [$_{AspectP}$ PFV/IPFV [$_{v\text{P}}$ ...]]

      b. $\|$ PFV $\| = \lambda$Pλt$\exists$e [t $\supset \tau$(e) $\wedge$ P(e)]

    c. $\| \text{IPFV} \| = \lambda P \lambda t \exists e \, [t \subset \tau(e) \wedge P(e)]$

As standardly assumed, aspectual operators take event predicates denoted by the complement vP and map them onto predicates over times, existentially binding the event variable. Specifically, perfective AspectPs denote times that incude the running time of an event from the denotation of vP, whereas the imperfective viewpoint aspect involves times that are included in the running time. The crucial characteristic of this architecture is that the Aspect head does not change the denotation of their vP complements, only introducing reference time and relating it to the running time of an event. The reader can easily check that combining the PFV operator in (50b) with event predicates in (48b-c) and (49b) would yield right interpretations for corresponding perfective clauses in (48a) and (48b).

    A straightforward prediction emerges at this point.[10] Since perfective and imperfective clauses share vP, one can expect that the latter exhibit exactly the same range of non-cuminating interpretations as the former. Imperfective PS-accomplishments would produce both FA and PS interpretations, while imperfective FA-accomplishments should only be compatible with failed attempt scenarios. Examples in (51a-b) show that this is indeed the case:

(51) a. išci üj-nü oj-a-dɨ.
        worker house-ACC demolish-IPFV-3SG
        'The worker is taking down the house.'
        Scenario 1 <partial success>: He has already revomed the roof.
        Scenario 2 <failed attempt>: He is striking the wall with a pick-axe but has not yet removed a single brick.

    b. fatima eki minut xalɨ-nɨ   zɨrt-a-dɨ.
        Fatima two minute thread-ACC tear-IPFV-3SG
        'Fatima is tearing a thread.'
        Only available scenario <failed attempt>: She is tugging the thread, but has not yet succeeded.

Concluding this section, I have to mention one problematic aspect of the analysis developed so far: representations in (47) are clearly a stipulation. While they do capture the difference between PS- and FA-accomplishments, one may be wondering if properties like [±inertia] can be reduced to some more basic semantic characteristics and thus receive a more fundamental explanation. In the next section, not offering a complete solution to this problem, I will present a few observations and generalizations that bear on the issue.

5 Restricting distribution of non-culminating eventive heads

A simple answer to the question asked in the previous section would be that not only [±inertia], but any lexical specification is a stipulation to some extent.

    One example of this could be thematic properties of arguments specified lexically in most theories of argument structure (see the recent survey by Levin and Rappaport

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[10]I am grateful to the CSSP anonymous reviewer who encouraged me to discuss this issue.

Hovav (2005)). For instance, we know that for some verbs the external argument must be the agent, while others allow in addition natural forces, instruments or events (cf. the celebrated distinction between *murder* and *kill*). This information, as many semanticists tend to believe, is ultimately about lexical items, not about syntactic structure they project or are inserted into. Hence thematic properties are to be specified in the lexicon in some way or other, being by no means less stipulative that the [±inertia] distinction introduced above.

Besides, on the constructionalist approach to event structure one tends to reduce information stored in the lexicon to the absolute minimum, only specifying lexical items for the properties visible in the course of the syntactic derivation. The [±inertia] specification accomplishes exactly this task. Under the present set of assumptions deriving vP and building the denotation of an event predicate it denotes only relies on two types of information: what subevents are present in the structure of this predicate and how these subevents can and cannot be distributed between actual and inertia worlds. It this respect, reducing the whole range of interpretations we observed in Sections 2-3 just to one lexical characteristic does not seem to be an undesired result.

Nevertheless, I believe that a more comprehensive answer to the question of where [±inertia] specifications come from seems to be possible, too. There are two fundamental observations about what makes [+inertia] specifications not available for certain lexical items that will be discussed in the two final subsections below.

5.1   The $v_{inertia}$ head and the incremental relation

The first observation is related to the distribution of the $v_{inertia}$ head. So far we were only dealing with accomplishment verbs that can be merged with $v_{inertia}$ freely. This not so for other verb classes, however. Specifically, incremental manner verbs like 'write', 'read', or 'plow' do not allow for the failed attempt interpretation, hence do not combine with $v_{inertia}$:

(52)   a.   alim eki saʁat-xa baxca-nɨ sür-gen-di.
       A.   two hour-DAT field-ACC plow-PFCT-3SG
       'Alim plowed a/the field in two hours.'

    b.   alim eki saʁat baxca-nɨ sür-gen-di.
       A.   two hour field-ACC plow-PFCT-3SG
       1. 'Alim was involved in plowing the field for two hours.'
       2. *'Alim tried to plow the field for two hours(, but did not make a single furrow).'

As (52b) shows, 'plow' produces the partial success interpretation in (52b.1), but not the failed attempt interpretation in (52b.2) (in addition to the telic culminating interpretation in (52a), of course). If verbs like *sür* 'plow' are analyzed as associated with accomplishment event structure, that is, are [+v], [+V], [+R], they should be specified as [$v_{inertia}$, $V_{i\,(\pm inertia)}$, R_i]. (In terms of the [±inertia] specification, such verbs are a mirror-image of FA-accomplishments like *zirt* 'tear', of type [$v_{\pm inertia}$, $V_{i\,(-inertia)}$, R_i].) One can be wondering, therefore, what restricts the distribution of $v_{inertia}$ and how the class of verbs that do not cooccur with this non-culminating head can be singled out.

First, it should be mentioned that the absence of $v_{inertia}$ characterizes a natural class of predicates in Balkar. These are verbs that denote complex eventualities where activ-

ity and process subevents necessarily coincide in time and where there a one-to-one mapping between parts of the process and parts of the activity (e.g., 'plow the field', 'read the paper', 'paint the wall', 'eat the sandwich'). For verbs like 'plow' in (52) it is necessary that for any part *e'* of the process *e* of getting plowed there be a corresponding piece of activity *f* that brings *e'* about, and that the running time of *e'* and *f* be identical. More precisely, the relation between activity and process subevents is a mapping to subordinate subevents with temporal coincidence:

(53)   The relation R on events is a mapping to subordinate subevents with temporal coincidence, MSbSE(R), iff
$\forall e \forall e' \forall e''$ [R(e')(e) $\land$ e'' < e $\rightarrow$ $\exists e'''$ [e''' < e' $\land$ R(e''')(e'') $\land$ τ(e''')= τ(e'')]]

If the relation between activity and process subevents is causative, as many semanticists including Ramchand suggest (see Rothstein 2004 for the alternative, and Ivanov, Tatevosov, to appear for discussion), one can assume a postulate in (54) associated with such verbs in the Encyclopedia:

(54)   *sür* 'plow': MSbSE(cause)

The opposite property, mapping to superordinate subevents in (55), holds for such verbs as well, as (56) makes explicit:

(55)   The relation R on events is a mapping to superordinate subevents with temporal coincidence, MSoSE(R), iff
$\forall e \forall e' \forall e''$ [R(e')(e) $\land$ e'' < e' $\rightarrow$ $\exists e'''$ [e''' < e $\land$ R(e'')(e''') $\land$ τ(e''')= τ(e'')]]

(56)   *sür* 'plow': MSoSE(cause)

(53) is of course a certain idealization. While normally any part of plowing activity induces a process in the theme, there may be eventualities that do count as components of the activity, but are not mapped onto any part of the process. For instance, in the course of plowing the plowman can spend some time fixing and adjusting his equipment, and this part of plowing activity makes no contribution to the change of state of the theme. One way of improving (53) is to assume a contextually salient function μ that picks out a set of proper parts of the superordinate event, μ(e), that does not contain subevents irrelevant for bringing about a change of state:

(57) $\forall e \forall e' \forall e''$ [R(e')(e) $\land$ e'' $\in$ μ(e) $\rightarrow$ $\exists e'''$ [e''' < e' $\land$ R(e''')(e'') $\land$ τ(e''')= τ(e'')]]

Whatever the ultimate solution for this problem is, it does not seem to affect the present line of reasoning. Assume that (54) and (56) are correct, that is, the causal relation between activity and process subevents for verbs like 'plow' satisfies both MSbSE and MSoSE. What we get is a special type of causation whereby two eventualities are causally related down to their proper parts and temporally coincident. If so, in no world any part of the activity in μ(e) is allowed to be left unassociated with a corresponding part of the process. This is exactly what makes 'plow' incompatible with $v_{inertia}$, because it is $v_{inertia}$ that creates event predicates like that in (49b), where the base world does not contain a process caused by the activity, but do contain pieces of activity that cause no process.[11]

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[11]One can claim that the above argument would actually predict that $v_{inertia}$ can combine with VPs like 'plow the field' provided that only those parts of the activity that are non members of μ(e) occur

Therefore, the fact that incremental verbs like 'plow' do not accept v $_{inertia}$ hence do not produce the failed attempt interpretation falls out from the constraints on the relation between activity and process subevents. Crucially, these (or similar) constraints are independently required for proper characterization of lexical semantics of such verbs.

5.2   The V $_{inertia}$ head and near-punctual eventualities

Now, let us look at what component of verbal lexical semantics can be incompatible with V $_{inertia}$, preventing FA-verbs from possessing the partial success interpretation. The list of FA-verbs and PS-verbs is repeated in (58):

(58)   a.   PS-verbs: *buz* 'spoil', *quj* 'pour out', *soz* 'stretch', *tazala* 'clean', *tög* 'spill out',...
       b.   FA-verbs: *ac* 'open', *ij* 'untie, release', *ujat* 'wake up', *sɨndɨr* 'break',...

The main observation here is that FA-verbs in (58b) have a property that tells them apart from PS-verbs in (58a): their change of state component is a near-punctual process. Whereas the amount of activity necessary to bring about a change of state is not determined by the lexical semantics of such verbs (in case of 'break', imagine a person who attempts to break a vase made of unbreakable glass), the change that happens to the theme is a process of extremely short (yet non-zero) duration (imagine the transition of the vase to the state of being broken). Let us take a closer look at near-punctuality, therefore.

Comrie (1976), among others, observes that near-punctual processes cannot normally be combined with the progressive. Out of the blue, sentences like *John is coughing* cannot refer to a single quantum of cough going on at the reference time; the only available interpretation involves a series of atomic coughing events. Informally, this restriction has to do with the fact that the duration of near-punctual processes (e.g., of a single quantum of cough) is too short: they do not possess identifiable phases, and their temporal progress does not involve observable change. As Comrie argues, this is what makes them incompatible with the progressive, whose function is exactly to refer to the internal developmental structure of events. Comrie's argument supporting this view is that in slowing down contexts, the single event reading of *John is coughing* becomes felicitous. The speaker watching a slowed down record can use this sentence to refer to what is going on between the temporal boundaries of a single quantum of cough. In a sense, slowing-down makes the internal structure of an atomic coughing event 'visible' for the progressive: the duration of coughing increases, its internal structure is made observable, the progressive becomes appropriate.

In Balkar, lexical verbs that denote near-punctual processes, e.g., *zötel et* 'cough', *aʁ* 'drip', *bulʁa* 'flap, flutter', *qaq* 'knock', are strictly parallel to their English counterparts. Out of the blue, their imperfective forms refer to ongoing processes like 'be coughing'

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in the actual world, while the rest of the activity along with the process it incrementally brings about is in inertia worlds. Recall, however, that $\mu(e)$ is a subset of all parts of *e*, *Part(e)*. The complement of $\mu(e)$ in *Part(e)* are exactly those parts of *e* that do not count as plowing — those are various kinds of accompanying eventualities (e.g., fixing the plow). A sequence only consisting of such eventualities in not a plowing activity, and thus does not fall under the denotation of the event predicate *plow $_A$*, which has to hold in the actual world.

that consist of sums of atomic events. In slowing down contexts they demonstrate the same effect as in English, admitting the single event reading (see Lyutikova et al. 2006: 189-190 for examples and discussion). The precise analysis of lexical near-punctuals goes beyond the scope of this paper.[12] What I am interested in for the moment is a mere descriptive generalization: near-punctuality is not semantically compatible with the progressive.

At this point, we can make two crucial observations. First, V$_{\text{inertia}}$ is an inertia modal operator whose semantics is similar to that of the progressive, hence one can expect that restrictions on their distribution are similar, too. Secondly, process subevents that are components of FA-verbs like 'open', 'untie' or 'wake up' in (58b) (i.e., transitions from being shut to being not shut, from being tied to being untied, from being asleep to being awake, etc.) are near-punctual in much the same way as events denoted by *cough* and other near-punctual lexical items. Given these observations, if it is near-punctuality that makes the progressive combined with verbs like *cough* infelicitous, we have every reason to suggest that incompatibility of V$_{\text{inertia}}$ with the process component of FA-verbs can be accounted for in a similar fashion — through the near-instantaneous character of the process and nonobservability of its internal structure. When a thread tears, we do not perceive the difference between the thread not affected by the tearing process at all and that affected to some extent, hence no partial success interpretation.

If this line of reasoning is on the right track, the question is: What does it mean for a process to have a "too short duration" and to produce "no observable effect in the actual world"?

Approaching a problem of near-punctual predicates that denote events whose duration is too short to make their internal structure observable, let us first take a look at events that possess an opposite property. Apresjan (2006) isolates a class of imperfective verbs in Russian that he calls (long-term) activities, e.g. *vospityvat'* 'bring up', *rukovodit'* 'supervise', *knjažit'* 'reign as a prince, exercise the power of prince'. A characteristic property of such verbs is that they resist adverbial modification specifying precise temporal or spatial location of a situation. Consider (59):

(59) a. $^{??}$Segodnja v 12.00   Vasja rukovodi-l
          today   at 12 o'clock V.   supervise.IPFV-PST.M
          aspirant-om.
          graduate.student-INSTR
          'Today at 12 p.m Basil was supervising his graduate student.'

      b. $^{??}$On sejčas knjaži-t   u seb-ja   v kabinet-e.
          he now reign.IPFV-PRS.3SG at REFL-GEN in office-LOC
          'He is now reigning in his office.'

Apresjan (2006) suggests that the reason for awkwardness of (59a-b) has to do with observability: events from the denotation of verbs like *rukovodit'* 'supervise' or *kniažit'* 'reign as a prince' are too protracted in time and consist of too many distinct activities, hence cannot be observed all at once. Whatever eventuality happens at a certain time

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[12]One possibility has recently been discussed by Susan Rothstein (2007) who treats verbs like 'cough' as simplex naturally atomic predicates.

and place, it is too short and too particular to be identified as a realization of supervising or reigning.

To make this intuition more precise, Apresjan introduces a notion of round of observation. If a person sits in the chair, runs in the garden, eats an apple, draws a circle, finds a wallet, all these events can be observed all at once. Things are different for long-term activities: these activities, Apresjan indicates, cannot fall within a single round of observation, they necessarily require a number of such rounds.[13]

Distinct rounds of observation necessarily occur at different times and, possibly, at different locations. But adverbials specifying the precise time or location presuppose that we are dealing with exactly one round of observation. If events in the denotation of an event predicate can be observed all at once and do not require more that one round, which is the case with most predicates, such adverbials are fine. With long term activities, however, the uniqueness-of-round-of-observation presupposition introduced by the adverbial fails, and that is the reason why (59a-b) are inappropriate.

Apresjan's (2006) view is further supported by the fact that if temporal adverbials are associated with a time measurement scale with lower density of representation points, their combinations with long-term activities improve considerably. Unlike (59a-b), (60), where the measurement scale involves years, not hours/minutes, is felicitous:

(60)   V 2004 god-u   Vasja rukovodi-l   aspirant-om.
       in   year-LOC V.   supervise.IPFV-PST.M graduate.student-INSTR
       'In 2004, Basil was supervising a graduate student.'

Measuring time in years does not presuppose the uniqueness of round of observation. On the contrary, a one-year period provides sufficient time for as many rounds as is required by the meaning of *rukovodit'* 'supervise'. Apresjan's intuition thus provides an elegant explanation for the contrast between (59) and (60).

Implicit in the above characterization of long-term activities is the notion of typical duration of events of particular event type. Indeed, the duration of individual events in the denotation of any event predicate can very substantially. What makes predicates like 'supervise a graduate student' and, say, 'eat a sandwich' different is that, typically, supervising lasts much longer than eating. Discussing coercion phenomena, Egg (2005) and Bary, Egg (2007) independently make out a case for introducing the notion of typical duration into the theory. As he shows, aspectual coercion is at least partially sensitive to mismatches between semantic requirements of aspectual operators and the typical duration of events in the denotation of event predicates these operators apply to. Let us elaborate on this in more detail.

Assume that a typical duration is an average duration. On this assumption, a typical duration function, TD, can be conceived of as a measure function of type $< <s,t>, d>$ that applies to an event predicate and yields the mean of the duration of running times of events in its extension:

(61) $\mathrm{TD}(P) = \mathrm{mean}\{n \mid \exists e[P(e) \wedge |\tau(e)| = n]\}$

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[13]Apresjan does not discuss his notion of round of observation in any detail. However, as I understand it, a metaphysical appeal behind this notion is to establish a cognitive basis for the granularity of time measurements implicit in the lexical meaning of natural language predicates. The default level of granularity is determined by the length of an abstract round-of-observation event. Events that can be observed all at once match this level of granularity, but longer events like 'supervise' or 'reign' do not.

The notions of typical duration coupled with the notion of the round of observation gives us a way of characterizing a condition necessary to single out long-term activities. Long-term activities are those activities whose typical duration exceeds the maximal duration of round-of-observation events:

(62) If *P* is a long-term activity, then
$$\text{TD(P)} > \max\{n \mid \exists e'[\text{round\_of\_observation}(e') \wedge |\tau(e')| = n]\}$$

Note that the typical duration function characterizes event predicates, not individual events in their extension. Accordingly, (62) does not exclude the possibility that an event predicate *P* contains events in its extension whose duration does match that of round-of-observation events, and this seems to be a welcome consequence of (61)-(62). Suppose that a prince is assassinated at the inauguration ceremony five minutes after he have assumed the power. In such a context (63) is felicitous, since the duration of reigning is short enough to be observed all at once:

(63) V 12.05 Vladimir knjaži-l v Kiev-e.
at 5 past 12 V. reign.IPFV-PST.M in K.-LOC
'At 12.05, Vladimir was reigning in Kiev.'

Therefore, the condition in (62) identifies the class of long-term activities in terms of their mean duration rather than in terms of the duration of a shortest event from the extension of a predicate. Typically, (62) says, long-term activities cannot fall within a single round of observation.

Having discussed how long-term processes can be treated, we can go back to short-term processes that, by hypothesis, are denoted by near-punctual lexical predicates like 'cough' and form a part of the denotation of FA-accomplishments like 'tear a thread' or 'wake up a person'. Taking the duration of the observation event as the standard against which the typical duration of events is evaluated, one can suggest that in terms of observability coughing, tearing or waking up processes are a mirror-image of long-term activities:

(64) Short-term processes:
$$\text{TD(P)} < \min\{n \mid \exists e'[\text{round\_of\_observation}(e') \wedge |\tau(e)| = n]\}$$

According to (64), short-term processes are too short to match the minimal duration of an observation event. It is in this sense that they fail to produce identifiable changes in the course of their development: while physically a thread can tear gradually, this happens too quickly for this graduality to be observable.

Among other things, (64) provides an explanation of what happens in slowing down contexts. Slowing-down contexts increase the duration of all events in the denotation of an event predicates, hence the typical duration increases, too. As a result, the typical duration associated with the predicate matches the duration of an observation event, thus becoming 'visible' for inertia modal operators like the progressive or V_{inertia}.

If these suggestions are correct and FA-accomplishments are indeed incompatible with V_{inertia} because the process component of their denotation involves near-punctual eventualities, one more expectation arises immediately. Take telic unaccusatives, i.e., intransitives that involve the process and result state components but no initiating activity ($[V_i, R_i]$ verbs in terms of the First Phase Syntax theory). If the $[\pm V_{\text{inertia}}]$

specification is sensitive to near-punctuality, we expect that just like accomplishments of type $[v, V_i, R_i]$, unaccusatives of type $[V_i, R_i]$ fall into two parts: those that can combine with $V_{inertia}$, and those that cannot. Unaccusatives of the latter type will exactly be those whose process component is near-punctual.

This prediction is borne out precisely. Compare (65a-b):

(65)   a. kusok buz eki saʁat eri-gen-di.
           piece ice two hour melt-PFCT-3SG
           'The piece of ice melted for two hours'.

      b. *illew eki minut sɨn-ʁan-dɨ.
           toy two minute break-PFCT-3SG
           'The toy broke for two minutes.'

(65a-b) contrast in that the former but not the latter allows for the non-culminating interpretation. (65a) indicates that the piece of ice has been affected by the melting process, but has not entered the result state of being melted. This interpretation is essentially a partial success, since (65a) entails that the piece of ice has partially melted. In the present system, it obtains due to $V_{inertia}$ that merges as the V head. No non-culminating interpretation is attested for (65b), however, suggesting that verbs like the intransitive 'break' are incompatible with $V_{inertia}$. Crucially, 'break' is a near punctual process (just like a tearing process that serves as a component of the FA-accomplishment 'tear a thread'), but 'melt' is not. And if it is near-punctuality that rules $V_{inertia}$ out, the pattern observed in (65) is exactly what we should find.

6 Conclusion

This study seems to achieve one main result. It contributes to a long-standing debate on how many subevents should be represented in event structures of accomplishment verbal predicates. Having identified two distinct types of non-culminating accomplishments, I argued that at least for languages like Karachay-Balkar the three-component decomposition provides significant advantages in accounting for the whole range of their interpretations.

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