Representing Accomplishments in Turkic Languages[*]

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Relying on evidence from Turkic languages, the paper argues for three threretical claims about the event structure of accomplishment predicates. First, activity and change of state subevents are to be represented independently. Secondly, accomplishments differ as to the relation between those subevents. Thirdly, there is a class of accomplishments that specify the activity component of the overall event as inherently ordered.

1. Accomplishment predicates: theoretical alternatives

Since the seminal work by David Dowty (1979), quite a number of proposals have been developed accounting for the internal constitution and interpretation of accomplishment event predicates like 'open the door' or 'break the window'. Current theories of accomplishment event structure vary along a number of dimensions, including the subevental makeup of accomplishments, sematic relations connecting components of the event structure, and internal constitution of those components. A few influential proposals (not making up an exhaustive list, of course) are represented in Table 1.

Table 1. Theories of accomplishment event structure

	Components of accomplishment structure	Relation(s) between components	Constraints on the internal structure of the components
Dowty 1979	Activity + Achievement (= become [result state])	Causal	None
Rappaport Hovav & Levin 1998 and elsewhere	Activity + Achievement (= become [result state])	Causal	Activity component is not speficied for descriptive properties, the result state is
Kratzer 2000, 2005	Activity +Result state	Causal	None
Rothstein 2004	Activity + Change of state	Incremental	Change of state subevent is partially ordered by the incremental chain
Ramchand 2008	Activity + Process + Result state	Causal	None

In this paper, I take into account evidence from non-culminating readings of accomplishment predicates in Turkic languages and argue that this evidence supports the following theoretical claims:

(i)   the activity subevent is to be represented independently from the change of state, or become subevent;

(ii)   different lexical accomplishment verbs constrain the relation between subevents in different ways;

(iii)   accomplishments differ as to the inherent orderedness of the activity subevent.

The rest of the paper is organized as follows. In Section 2, I introduce relevant material from three Turkic languages, Chuvash, Tuba Altai and Karachay-Balkar and observe that accomplishments in these languages fall into three types. Some yield *the failed attempt interpretation*, others *the partial success interpretation*, yet others do not license *non-culminating readings* at all. Section 3 offers a general survey of non-culmination phenomena and argues for a decompositional analysis of accomplishment event structure. In Section 4, two types of relations between subevents in the accomplishment structure are identified; the failed attempt and partial success readings are reduced to the properties of these relations. Section 5 argues that availability of a non-culminating interpretation is determined by a non-trivial semantic characteristic: if an activity component of accomplishment structure is partially ordered by the temporal precedence and/or causal dependence, the non-culminating readings are illicit. This information comes out as a lexical axiom constraining a denotation of the activity predicate in the decompositional accomplishment structure.

2. Non-culminating accomplishments in Turkic languages

To begin with, let us look at (1)-(6) that present two sets of observations. First, whereas some of accomplishment predicates do allow for both culminating and non-culminating interpretations, others do not. In all the sentences in (1)-(3), the event culminates, and immediately after the culmination the light is off, (1a), the person is awake, (1b), the model is assembled, (1c), and so on. These sentences are telic, as the usual test on co-occurecne with time-span adverbials indicates. In contrast, in (4)-(6) an eventuality does not reach culmination and sentences are atelic: they only entail that some amount of the agent's activity has been performed during a certain time interval. Crucially, while accomplishments in (b) and (c) examples in (4)-(6) accept the non-culminating interpretation, those in (a) examples do not.

Secondly, non-culminating readings in (b) and (c) examples in (4)-(6) are different: (b) examples refer to a *failed attempt* (FA), whereas (c) examples report on a *partial success* (PS). FA sentences in (4b)-(6b) describe an activity performed by the agent that aims at changing a state of the theme. However, this activity terminates before the change is attained, so the agent's attempts to wake up a person, tear a thread, etc., fail, and the theme remains in its initial state. In PS examples, the event does not culminate, but in a strikingly different way: each of (4c)-(6c) entails that an affected participant undergoes at least some change.

(1)   a.   vašʲa eki   šʲekunt xušănčě   šʲută sünter-č-ě.   **Chuvash**
              V.   two   second   within   light turn.off-PFV-PST
              'Basil turned the light off in two seconds.'
       b.   vašʲa eki   minut   xušănčě petuk-na   vărat-r-ě.
              V.   two   minute within   P.-ACC   wake.up-PFV-PST
              'Basil woke up Peter in two minutes.'
       c.   vašʲa šʲirěm minut xušănčě samalot matell-a   pušʲtar-č-ě.
              V.   twenty minute within   plane   model-ACC assemble-PFV-PST
              'Basil assembled a model of a plane in twenty minutes.'

(2) a. vasʲa eki čas-xa   petʲa-nɨ   köm-di. **Tuba Altai**
         V.   two hour-DAT P.-ACC   bury-PST.3SG
         'Basil buried Peter in two hours.'
     b. vasʲa on   minut-xa   ešik-ni   ač-tɨ.
         V.   ten minute-DAT door-ACC   open-PST.3SG
         'Basil opened the door in ten minutes.'
     c. vasʲa su:-nɨ   eki   minut-xa   so:t-tɨ.
         V.   water-ACC two   minute-DAT cool-PST.3SG
         'Basil cooled the water in two minutes.'

(3) a. alim eki   sekunt-xa kerim-ni attɨr-dɨ. **Karachay-Balkar**
         A.   two   second-DAT K.-ACC   shot-PST.3SG
         'Alim shot Kerim (dead) in two seconds.'
     b. kerim on   sekunt -xa xalɨ-ni   zɨrt-tɨ.
         K.   ten second-DAT thread-ACC tear-PST.3SG
         'Ќerim tore a thread in ten seconds.'
     c. išci eki   kün-ge   üj-nü   oj-dɨ.
         worker two-DAT day-DAT house-ACC demolish-PST.3SG
         'The worker took down the house in two days.'

(4) a. *vašʲa eki   minut   šʲutǎ sünter-č-ě. **Chuvash**
         V.   two   minute light turn.off-PFV-PST
         'Basil tried to turn the light off for two minutes.'
     b. vašʲa šʲirěm minut   petuk-na vărat-r-ě.
         V.   twenty minute P.-ACC   wake.up-PFV-PST
         'Basil tried to wake up Peter for two minutes.'
     c. vašʲa šʲirěm minut   samalot matell-a puš'tar-č-ě.
         V.   twenty minute plane   model-ACC assemble-PFV-PST
         'Basil was involved in assembling a model of a plane for twenty
         minutes.'

(5) a. *vasʲa eki   čas   petʲa-nɨ   köm-di. **Tuba Altai**
         V.   two   hour P.-ACC   bury-PST.3SG
         'Basil was involved in burying Peter for two hours.'
     b. vasʲa on   minut   ešik-ni   ač-tɨ.
         V.   ten   minute door-ACC open-PST.3SG
         'Basil tried to open the door for ten minutes.'
     c. vasja eki   minut   su:-nɨ   so:t-tɨ.
         V.   two   minute water-ACC cool-PST.3SG
         'Basil was involved in cooling the water for two minutes.'

(6) a. *alim eki   saʁat kerim-ni attɨr-dɨ. **Karachay-Balkar**
         A.   two   hour K.-ACC   shot-PST.3SG
         'Alim tried to shot Kerim (dead) for two hours.'
     b. kerim on   minut xalɨ-ni   zɨrt-tɨ.
         K.   ten minut thread-ACC tear-PST.3SG
         'Ќerim tried to tear a thread for ten minutes.'
     c. išci eki   kün   üj-nü   oj-dɨ.
         worker two   day   house-ACC demolish-PST.3SG
         'The worker was involved in taking down the house for two days.'

Reserving the discussion of the contrast between (a) and (b)-(c) examples for the Section 5, for the moment let us take a closer look at non-culminating predicates like 'wake up a person', 'open the door', 'tear a thread' in (4b)-(4b) and 'assemble a model', 'cool the water' and 'take down a house' in (4c)-(6c). Such predicates present two distinct questions addressed in Section 2. First, we want to know how the non-culminating interpretation in (b)-(c) examples in (4)-(6) is derived and how this interpretation is related to the telic interpretation in (b)-(c) examples in (1)-(3). Secondly, we have to determine where the difference between FA-accomplishments like 'wake up a person', 'tear a thread', etc., in (b) examples and PS-accomplishments like 'assemble a model', 'cool the water', etc., in (c) examples in (4)-(6) comes from.

3. Non-culmination

All of the non-culminating predicates in (b) and (c) examples in (4)-(6) form a natural class: all of them accept measure adverbials and are therefore atelic. Furthemore, they present the same imperfective paradox as the progressive (Dowty 1979 and huge subsequent literature): a proposition in (b)-(c) examples in (4)-(6) can be true in the base world without a corresponding proposition in (b)-(c) examples in (1)-(3) being true. This observations have lead to what I call partitive theory of non-culmination: on the non-culminating reading, a part or a stage of an eventuality from the original extension of a predicate occurs in the base world. The complete eventuality only exists in inertia worlds (Dowty 1979), in worlds in the continuation branch of the event (Landman 1992), or in whatever other possible worlds our favorite theory solving the imperfective paradox tells us; the below argument does not depend on a particualr choice. Different variants of the partitive theory can be found in Koenig and Muansuwan 2001, Bar-el et al. 2005 and Tatevosov, Ivanov 2009.

If tenseless vPs are analyzed as denoting event predicates, the vP in (1b) can be translated in the neo-Davidsonian way as in (7), and its non-culminatin variant in (3b) as in (8). In (8), CM is a continuation modality operator which can be thought of as identical to Landman's (1992) progressive (PROG) operator mapping events onto their stages, except for one thing. Since one of the stages of the event e is e itself, PROG allows e to culminate in the base world. CM, then, is like PROG, but maps events onto their *proper non-final stages*. For the moment, I am abstracting away from how (8) is compositionally derived from (7); I will return to this issue shortly.

(7) $\lambda e[\text{wake}(e) \wedge \text{agent}(\text{basil})(e) \wedge \text{theme}(\text{peter})(e)]$
(8) $\lambda e[\text{CM}(e, \lambda e'.\text{wake}(e') \wedge \text{agent}(\text{basil})(e') \wedge \text{theme}(\text{peter})(e'))]$

The crucial thing to note about (7)-(8) is that they offer a non-decompositional analysis of 'wake up a person': the waking event is regarded as an indivisible whole, and the CM operator extracts its proper non-final stages. This is where a complication lies.

To see this, let us take a closer look at the FA and PS sentences. Whereas FA sentences in (4b)-(6b) describe an event in which nothing happens to the theme, their PS counterparts in (4c)-(6c) imply that the theme undergoes

at least some change. In other words, FA and PS accomplishments differ as to whether a process in the theme occurs in the base world. What they share is that the culmination does not occur in the base world. This us summarized in Table 2.

Table 2. *Culminating and non-culminating readings*

	CULMINATING	NON-CULMINATING	
		Partial success	**Failed attempt**
Agent's activity	In the base world	In the base world	In the base world
Process in the Theme	In the base world	In the base world	Not in the base world
Culmination of the process	In the base world	Not in the base world	Not in the base world

Intuitively, what makes failed attempts like 'wake up a person' different from partially successful actions like 'assemble a model' is how the agent's activity is related to the change of state induced by that activity. PS accomplishments are construed in such a way that any contextually relevant part of the activity produce some change in the theme. Therefore, any proper non-final stage of the overall eventuality brings about some change. In contrast, in case of FA accomplishments, non-final parts of the activity do not produce any change at all. If the waking up event in (4b) had culminated, the whole change of state of the theme would have occurred at the very final part of waking activity. But the activity stops before the culmination, and at that point the theme is still in its initial state.

The problem, then, is that this intuition cannot be captured within a non-decompositional representation like (7)-(8), since waking up and assembling events will inevitably be treated on a par:

(9) $\lambda e[\text{assemble}(e) \wedge \text{agent}(\text{basil})(e) \wedge \text{theme}(\text{model})(e)]$
(10) $\lambda e[\text{CM}(e, \lambda e'.\text{assemble}(e') \wedge \text{agent}(\text{basil})(e') \wedge \text{theme}(\text{model})(e')]$

(7) and (9) do not impose any explicit restrictions on how activity is related to the change of state. Assume the event predicate in (7) denotes waking up events in which the activity immediately precedes the change of state. If so, why is the same temporal constitution not available for events in the denotation of event predicate in (9)? Why can't it be the case that (9) contains assembling events in which the whole agent's activity temporally precedes change of state of the model? Common sense suggests that this would not be a possible assembling-a-model event, but (9) does not tell us why this should be the case.

Therefore, the distribution of subevental components between actual and non-actual worlds from Table 2 is impossible to derive, because the PS and FA interpretations cannot be distinguished explicitly by the semantic representations like (8)-(10). This happens because the non-decompositional theory does not provide us with enough subevental structure. So a necessary condition for capturing the difference between 'wake up a person' in (7)-(8) and 'assemble a model' in (9)-(10) is decomposing event predicates into more articulated event structures consisting of distinct subevental components: this is the only way of making explicit that the activity subevent can occur in the base world either with or without the change of state it brings about. A decompositional theory of accomplishment event structure will be outlined in the next section.

4. Subevents and their relations

As a first try, let us assume that our predicates are now represented as in (11)-(12), where the overall eventuality consists of activity and change of state components, causally related:

(11) $\lambda e \exists e' \exists e''[e=e' \oplus e'' \wedge \text{wake}_A(e') \wedge \text{agent}(\text{basil})(e') \wedge \text{wake}_{CS}(e'') \wedge$
       $\text{theme}(\text{peter})(e'') \wedge \text{cause}(e'')(e')]$
       where wake_A denotes waking up activities and wake_{CS} events of getting awake.

(12) $\lambda e \exists e' \exists e''[e=e' \oplus e'' \wedge \text{assemble}_A(e') \wedge \text{agent}(\text{basil})(e') \wedge \text{assemble}_{CS}(e'') \wedge$
       $\text{theme}(\text{thread})(e'') \wedge \text{cause}(e'')(e')]$
       where assemble_A denotes assembling activities and assemble_{CS} events of getting assembled.

It immediately becomes clear that (11)-(12) do not give us much. Apart from other problems with the causative analysis of accomplishments (e.g., Rothstein 2004: 104; Tatevosov, Ivanov 2009), (11)-(12) present the same complication as before. Up to predicate constants, 'wake up a person' and 'assemble a model' denote the same event structure, and their different behavior with respect to the non-culminating interpretations is still a mystery.

   This means that separating activity and process components of the overall eventuality is a necessary condition for accounting for the FA and PS interpretations, not a sufficient one. To make sure that semantic peculiarities of FA and PS predicates are fully revealed, one has to say something about the relation between the activity and change of state subevents. For if this relation is conceived of as that of (immediate) causation, as in (11)-(12) (this is the most commonly accepted option in the literature, see Table 1), we are still in trouble.

   The source of the complication seems to be clear: the causal relation in (11)-(12) does not say anything about temporal relations between subevents (except that, trivially, the cause cannot occur after the effect). As a solution of this problem, Tatevosov & Ivanov (2009) develop a theory of accomplishement event structure that relies on and extends Rothstein 2004. Rothstein's theory is briefly summarized in (13):

(13) Rothstein (2004): basic definitions
   a. Accomplishment event template
     $\lambda y \lambda e \exists e_1 \exists e_2 [e = {}^S(e_1 \cup e_2) \wedge \text{ACTIVITY}(e_1) \wedge \text{agent}(e_1)=x \wedge$
     $\text{theme}(e_1)=y \wedge \text{BECOME}(e_2) \wedge \text{arg}(e_2)=\text{theme}(e_1) \wedge \text{INCR}(e_1, e_2, C(e_2))]$
     where ${}^S(e_1 \cup e_2)$ is a singular entity created out of e_1 and e_2
   b. Incremental relation between (sub)events
     $\text{INCR}(e_1, e_2, C(e_2))$ (e_1 is incrementally related to e_2 with respect to the incremental chain $C(e_2)$) iff there is a contextually available one-one function μ from $C(e_2)$ onto $\text{PART}(e_1)$ such that $\forall e \in C(e_2)$ $\tau(e)= \tau(\mu(e))$
   c. Incremental chain
     $C(e)$ is a set of parts of e such that the smallest event in $C(e)$ is the initial bound of e, for every e_1, e_2 in $C(e)$ $e_1 \leq e_2$ or $e_2 \leq e_1$, and e is in $C(e)$

In Rothstein's account, accomplishments are sums of two subevents, where the summing operation $^S(e_1 \cup e_2)$ creates a singular entity. Relevant subevents are activity (e_1 in (13a)) and become (=change of state, e_2 in (13a)). In Rothstein's system, subevents are related incrementally. The INCR(emental) relation in (13b) involves a contextually salient function that establishes a one-to-one correspondence between parts of the incremental chain, (13c), and parts of the activity. This function replaces the usual causal relation between subevents, guaranteeing that related subevents are temporally co-extensitve.

For Rothstein, the INCR relation is a defining property of accomplishments. In this way, her analysis captures characteristics of PS-verbs like 'read', 'sew', or 'plow'. However, she does not discuss in any detail predicates like 'tear a thread', 'wake up a person', etc. But for such predicates the relation between subevents cannot be incremental, since, as we saw earlier, the activity (up to its final point) does not contribute to the development of the become subevent at all. Under the FA interpretation, whatever activity is performed, the patient retains its initial state.

In Tatevosov and Ivanov 2009 we argue that INCR is only one of the possible relations between activity and change of state subevents within the accomplishment event structure. FA-predicates like 'wake up a person' are associated with the same event structure as 'assemble a model' except for one thing: the relation between subevents is not INCR, but a *Mapping to a minimal final part* (MMFP) defined in (14).

(14)   a. e_1 stands in the Mapping to a minimal final part relation to e_2, MMFP(e_2)(e_1), iff there is a contextually available function μ from e_2 onto PART(e_1) such that e_2 is mapped onto the minimal final part of e_1.

        b.   an event e' is a final part of e iff $e' \leq e \wedge \neg \exists e'' \, [e'' \leq e \wedge e' \ll e'']$ where $\ll$ is a precedence relation on events (Krifka 1998: 207)

        c.   an event e' is a minimal final part of e iff e' is a final part of $e \wedge \neg \exists e'' \, [e''$ is a final part of $e \wedge e'' < e']$

Due to MMFP, nothing in the change of state subevent is mapped onto non-final parts of the activity subevent, and this is exactly what we need to capture the intuition that non-final parts of the activity do not induce a change. Having distinguished INCR and MMPF, we can offer the following semantic representation for PS-accomplishments like 'assemble' and FA-accomplishments like 'wake up':

(15) $\lambda e \exists e' \exists e'' [e = e' \oplus e'' \wedge \text{wake}_A(e') \wedge \text{agent}(\text{basil})(e) \wedge$ $\text{theme}(\text{peter})(e') \wedge \text{wake}_{CS}(e'') \wedge \text{arg}(e'')=\text{theme}(e') \wedge$ $\text{MMFP}(e'')(e')]$

(16) $\lambda e \exists e' \exists e'' [e = e' \oplus e'' \wedge \text{assemble}_A(e') \wedge \text{agent}(\text{basil})(e') \wedge$ $\text{theme}(\text{model})(e') \wedge \text{assemble}_{CS}(e'') \wedge \text{arg}(e'')=\text{theme}(e') \wedge$ $\text{INCR}(e'')(e')(C(e''))]$

Essentially, the difference between two types of accomplishments is reduced to the relation between activity and become subevents, exactly as the intuitive characterization in Section 3 suggests. PS-accomplishments involve Rothstein's

incremental relation, whereas FA-accomplishments are constructed by mapping the whole change of state to a minimal final part of the activity.

(15)-(16) represent culminating variants of FA and PS accomplishments. The non-culminating ones are derived by applying the CM operator, as before:

(17) $\lambda e.CM(e, \lambda e_1 \exists e' \exists e''[e_1 = e' \oplus e'' \wedge wake_A(e') \wedge agent(basil)(e') \wedge theme(peter)(e') \wedge wake_{CS}(e'') \wedge arg(e'')=theme(e') \wedge MMFP(e'')(e')])$

(18) $\lambda e.CM(e, \lambda e_1 \exists e' \exists e''[e_1 = e' \oplus e'' \wedge assemble_A(e') \wedge agent(basil)(e') \wedge theme(model)(e') \wedge assemble_{CS}(e'') \wedge arg(e'')=theme(e') \wedge INCR(e'')(e')(C(e''))])$

(17) denotes events that are proper non-final stages of complete waking up events. They consist of an activity in which Basil is the agent and the door is the theme, and change of state. By definition, proper non-final stages do not contain final parts of events from the original extension of the predicate. But due to MMFP, it is exactly the final part of opening event at which the change of state occurs. Consequently, the predicate in (17) denotes events in which the agent's activity does not yield any change of state. In this way, the FA reading obtains.

If an INCR-accomplishment, e.g., 'assemble the model' undergoes the same derivation, this results in a predicate in (18). The crucial difference between (17) and (18) is that the latter contains the change of state subevent incrementally related to the activity. Accordingly, while (18) denotes not fully developed assembling-the-model events, but their proper non-final stages, any such a stage due to incrementality necessarily involves some change in the theme. This accounts for the PS interpretation of 'assemble' and other PS-accomplishments from Section 2.

If this analysis is correct, it immediately brings us in a significant advantage: being a combination of a (modalized) partitive theory of non-culmination and a decompositional theory of accomplishment event structure, it accounts for both similarities and differences between FA and PS accomplishments in a principled way. On the one hand, all non-culminating readings are uniformly derived by the same CM operator, which forces the culmination out of the base world. On the other hand, assuming different relations between subevents, INCR vs. MMFP, opens a way of capturing the distinct behavior of FA and PS prdicates with respet to non-culmination. It is these relations that are responsible for different distribution of subevental material between our world and worlds in the continuation branch of the event referred to.

Given this result, we can now go back to the contrast between (a) examples and (b)-(c) examples in (4)-(6) and address our final question: why are non-culminating interpretations (either FA or PS) available for some accomplishments but not for others?

5. Activity shift

So far I have shown that *if* an accomplishment predicate allows a non-culminating interpretation, *then* a plausible analysis would involve something like the CM operator extracting proper non-final stages of an event from the

original extension of the predicate. However, (4a)-(6a) show that accomplishments like 'shoot a person (dead)' only denote culminating events. Intuitively, 'shoot a person (dead)' in (6a) resemble MMFP accomplishments discussed so far (e.g., 'wake up a person' in (4b)) in that the change of state occurs at the minimal final part of the activity. But rather than yielding the FA-interpretation, these predicates produce no non-culminating reading at all. Why? Why is it not the case that the CM operator applying to 'shoot a person' yields a predicate that denotes non-final stages of shooting-a-person event?

To approach this question we have to make an additional observation. Non-culminating accomplishments, both FA and PS, e.g., 'wake up a person' in (4b) or 'take down a house' (6c) are construed in such a way that contextually salient subevents which their activity component consists of are not ordered by *temporal precedence* and *causal dependence*.

Imagine that the agent, who aims at waking up Peter, first calls him in a whisper, then calls him loudly, then claps hands at his ear, then shakes his shoulder. Finally, when he pours cold water on his face, Peter wakes up. This is a culminating interpretation of 'wake up Peter' in (1b). Crucially, while calling Peter loudly, clapping hands and shaking his shoulder are clearly parts of the waking up activity, they are not members of the causal chain leading Peter to being awake. Waking up does not casually depend on these (sub)events, since if they do not occur, this has no consequences for the occurrence of waking up (sub)event.

Now suppose that the agent performs all the above actions except the very final one. As soon as he sees that shaking Peter's shoulder does not yield the desired result, he gives up. This is the non-culminating FA interpretation in (4b). Now the activity occurring in the base world only contains subevents on which the change of state is not causally dependent. Nor do these subevents causally depend on each other: it is perfectly possible to shake one's shoulder without calling one in a whisper and vice versa. Temporal sequencing of these subevents is irrelevant either: regardless of the order in which they occur, their sum still counts as a waking up activity. Exactly the same is true of 'open the door' in (5b) and 'tear a thread' in (6b).

The generalization that emerges at this point is: on the FA interpretation, MMFP predicates like 'wake up' refer to activities that are not inherently ordered by the causal dependence and/or temporal precedence. This generalization extends to the activity component of INCR accomplishments: as Rothstein (2007) conclusively shows, the lexical meaning of INCR accomplishments does not impose any inherent ordering on the activity subevent.

Another piece of evidence supporting the same generalization is as follows. The continuation modality is what, by hypothesis, non-culminating accomplishments share with the progressive. But, again, the former are constrained in a way the latter is not. To see this, let us take a look at a predicate whose lexical meaning does not fix rigidly the descriptive properties of the activity component of the complex event, e.g., 'open the door' in (2b) and (5b). Progressive clauses based on 'open the door', e.g., *Vasja ešik-ni ač-ipt'it* 'Basil is opening the door', license two scenarios in (19a-b) (along with many others, of course):

(19)　　a. Scenario 1. The door is opened by entering a code that consists of a sequence of numbers, e.g., 1-2-3-5-5-6-7-8. At the reference time, the agent is entering the sixth number out of eight.

b. Scenario 2. The lock on the door is broken. The agent tries to open the door with the key, then applies a picklock, then uses a pinch bar, then tries to disassemble the lock, etc. At the reference time, she performs one of these actions.

Unlike the progressive, the non-culminating accomplishment in (5b) is compatible with the scenario 2, but not with the scenario 1. (5b) is licit if the agent performs a series of actions like those in (19b), but then stops without achieving a result. It is not felicitous if the event interrupts when the agent has introduced six numbers out of eight, as in (19a).

Again, the difference between scenarios 1 and 2 in (19) has to do with whether the series of actions that make up an opening activity is inherently ordered. Scenario 1 imposes an inherent order on the activity by sequencing the numbers which the code consists of. On the Scenario 2, relevant elements of the activity need not to occur in any particular order, since they are not causally dependent on each other (one can try to disassemble the lock regardless of whether she has already tried a pinch bar), nor has to form any specific temporal sequence (one can try a pinch bar either before or after the key).

Therefore, our observations point towards the simple conclusion. Non-culminating accomplishments require that the eventuality be not inherently ordered. Let us try to make more explicit what the inherent orderedness is. I suggest that the lack of inherent order can be captured by something like the general homogeneity property in (20):

(20) $\forall P[\text{G-HOM}(P) \leftrightarrow \text{T-HOM}(P) \wedge \text{C-HOM}(P)]$

According to (20), a predicate P is generally homogeneous if it is temporally homogeneous, T-HOM(P), and causally homogeneous, C-HOM(P). Causal homogeneity can be defined as in (21):

(21) $\forall P[\text{C-HOM}(P) \leftrightarrow \forall e[P(e) \rightarrow \forall Q[\forall e'[Q(e') \rightarrow e' \leq e] \rightarrow$
        $\forall e''\forall e''' [Q(e'') \wedge Q(e''') \rightarrow \neg\text{CDEP}(e''')(e'')]]]]$
        where "$\leq$" is the mereological part-of relation, and CDEP is a relation of causal dependence.

In prose, (21) says that the predicate P is causally homogeneous iff for any partition Q of events from the extension of P is not the case that any members of this partition causally depend on each other. I assume the standard view going back to Lewis 1973 that causal dependence is reduced to the counterfactual dependence.

Replacing the relation "be causally dependent on" with the relation "necessarily precede" gives us the notion of temporal homogeneity:

(22) $\forall P[\text{T-HOM}(P) \leftrightarrow \forall e[P(e) \rightarrow \forall Q[\forall e'[Q(e') \rightarrow e' \leq e] \rightarrow$
        $\forall e''\forall e''' [Q(e'') \wedge Q(e''') \rightarrow \neg\text{NPREC}(e''')(e'')]]]]$

The NPREC relation can be thought of as a combination of metaphysical necessity with temporal precedence. I leave the technical elaboration for a future occasion.

We have just seen that non-culminating predicates refer to generally homogeneous activities in the sense of (20). But the semantics in (17)-(18), as it

stands, does not capture this. Now we can offer am improvement. I hypothesize that the meaning of non-culmination in languages like Chuvash, Tuba and Karachay-Balkar is an outcome of an accomplishment-to-activity shift in (23):

(23) $\text{SHIFT}_{\text{ACCOMPLSHMENT}\rightarrow\text{ACTIVITY}}(P) = \lambda e.H(\lambda e'.CM(e', P))(e)$

The contribution of the $\text{SHIFT}_{\text{ACCOMPLSHMENT}\rightarrow\text{ACTIVITY}}$ operation is two-fold. First, it guarantees the event does not culminate in the base world by applying the CM operator to the set of events in the original extension of an accomplishment predicate P. Secondly, it requires that whatever proper non-final stages a P-event occurs in the base world, they must be generally homogeneous in the sense of (20). The latter characteristic is due to the H(omogeneity) operator, which has the logical type $<<v,t,>,<v,t>>$, that of predicate modifier. Here is a possible way of defining this operator:

(24) $H(P) = \{e \mid P(e) \wedge \exists Q[\text{G-HOM}(Q) \wedge Q \subseteq P \wedge Q(e)] \}$

According to (24), the result of the application of the H operator to the predicate P, H(P), is a generally homogeneous subset of events from the original extension of P, if P happens to contain such a subset. Otherwise, the extension of H(P) is empty.

With this refinement, the non-culminating predicate 'wake up Peter' in (17) now looks as in (25); the predicate 'assemble a model' in (18) can be assigned a representation along similar lines.

(25) $\text{SHIFT}_{\text{ACCOMPLSHMENT}\rightarrow\text{ACTIVITY}}(\lambda e\exists e'\exists e''[e = e' \oplus e'' \wedge \text{wake}_A(e') \wedge$ agent(basil)(e) $\wedge$ theme(peter)(e') $\wedge$ $\text{wake}_{CS}(e'') \wedge$ arg(e'')=theme(e') $\wedge$ MMFP(e'')(e')]) $= \lambda e[H(\lambda e_1.CM(e_1, \lambda e_2\exists e'\exists e''[e_2 = e' \oplus e'' \wedge \text{wake}_A(e')$ $\wedge$ agent(basil)(e') $\wedge$ theme(peter)(e') $\wedge \text{wake}_{CS}(e'') \wedge$ arg(e'')=theme(e') $\wedge$ MMFP(e'')(e')])](e)

In (25), the CM operator creates an event predicate containing proper non-final stages of waking up events in its extension. As before, since activity and change of state components are connected by the MMFP relation, those stages only contain the agent's activities but not processes in the theme induced by thsese activities. The H operator, then, identifies a homogeneous subset of waking up activities. Therefore, the outcome of the shift is not an accomplishment anymore, but an activity. The reader can check for herself that whatever reasonable conditions on activities one assumes, the resulting event predicate in (25) would satisfy them.

Now we can account for why predicates like 'shoot a person dead' disallow non-culminating interpretations. The idea is: accomplishment verbs differ as to the degree to which they fix lexically inherent orderedness of the activity subevent. While predicates over activities that are part of the denotation of 'wake up a person', etc., (e.g., wake_A in (25)) do contain homogeneous subsets of events, those associated with 'shoot a person dead', etc., do not.

Shooting-a-person activities consist of subevents like loading a bullet, taking aim, pulling a trigger, firing a shot. They are necessarily partially ordered by temporal precedence (e.g., pulling the trigger follows taking aim, and firing a shot follows pulling the trigger), and by causal dependence (e.g., it is not

possible to fire a shot without loading a bullet and to hit the target without taking aim). The same is true of activities referred to by 'turn the light off' and 'bury a person' in (4a)-(5a). They are sequences of actions such that if they are performed in incorrect temporal order or some of them are skipped, the overall sequence does not count as a turning-the-light-off or burying-a-person activity anymore. Sets of such activities do not offer homogeneous subsets to the H operator, hence applying the H operator to such activities yields an empty set of events. This is the reason why the non culminating interpretation is not available for 'shoot a person (dead)' and similar predicates.

If this generalization is correct, we can make it explicit by assigning appropriate axioms to activity predicates that are components of the complex accomplishment event structure:

(26)   a. H-SUBSET($wake_A$)   b. ¬H-SUBSET($shoot_A$)
        b. $\forall P[\text{H-SUBSET}(P) \leftrightarrow \exists Q[Q \subseteq P \wedge \text{G-HOM}(Q)]]$

The axiom in (26a) says that the set of events the predicate $wake_A$ denotes possesses a homogeneous subset. This guarantees that the extension of the shifted accomplishment in (25) is not empty. In contrast, according to (26b), the event predicate $shoot_A$ does not have a homogeneous subset, hence the event predicate in (27), derived in parallel with (25), denotes an empty set of events:

(27)   SHIFT$_{\text{ACCOMPLSHMENT}\rightarrow\text{ACTIVITY}}$($\lambda e \exists e' \exists e''[e = e' \oplus e'' \wedge shoot_A(e') \wedge$
        agent(basil)(e) $\wedge$ theme(peter)(e') $\wedge shoot_{CS}(e'') \wedge$ arg(e'')=theme(e') $\wedge$
        MMFP(e'')(e')]) = $\lambda e[\text{H}(\lambda e_1.\text{CM}(e_1, \lambda e_2 \exists e' \exists e''[e_2 = e' \oplus e'' \wedge shoot_A(e')$
        $\wedge$ agent(basil)(e') $\wedge$ theme(peter)(e') $\wedge shoot_{CS}(e'') \wedge$ arg(e'')=theme(e') $\wedge$
        MMFP(e'')(e')])](e)

Now we are in a position of summarizing main results of the study.

6.   **Summary**

I distinguished between three subclasses of accomplishments that differ as to whether they allow for the *failed attempt reading, partial success readings or none of them*. In accordance with claims independently made in the literature, I suggested that the essential part of the semantic structure of non-culminating predicates is *the continuation modality operator*. I argued that we need a decompositional analysis of accomplishments whereby activity and change of state component are represented independently. The difference between FA and PS accomplishments is determined by the relation between activity and change of state subevents. The failed attempt interpretation obtains it this relation is the mapping to a minimal final part, whereas the partial success interpretation is due to the incremental relation originally proposed by Rothstein (2004). Finally, I demonstrated that non-culminating accomplishments denote events that are not inherently ordered by temporal precedence and causal dependence. This led me to the conclusion that the derivation of non-culminating accomplishments is essentially an activity shift. The crucial characteristic of this shift is that its outcome must me temporally and causally homogeneous. This, in turn, explains why a certain class of accomplishments does not possess non-culminating

readings: if the activity component of the accomplishment is necessarily non-homogeneous (that is, inherently ordered) the non-culminating interpretation, be it FA or PS, is illicit.

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СКОРЕЕ ВСЕГО ВЕРНО ПОСЛЕДНЕЕ

$\forall Q[\text{G-HOM}(Q) \land Q \subseteq P \ Q(e) \ \forall e'[Q(e') \rightarrow P(e')] \land]$
В общем, надо сказать, что если у P есть гомогенная часть, что эта штука обозначает ее, а в противном случае пустое множество

suitable Let us call activities like these inherently ordered, or IO-activities.
Я понял, что надо делать. Надо определить, что гомогенность — это свойство некульминирующих свершений, а дальше сказать, что если исходный предикат обладает гомогенными деятельностями, то он допускает некульминацию, а если не обладает, то не допускает.

Therefore, the generalization emerging at this point is straightforward.

6. Putting ingredients together

In section ***, we have argued that non-culminating interpretations involve the continuation modality whereby the culmination occrus in worlds in the continuation branch of the the event. In section 3 we have observed that
 свойства некульминирующих свершений

is not false in this situation but rather are

Therefore, being generally homogeneous rather than being cumulative in a mereological sense is what makes the activity component of accomplishments like 'shoot a captive' different from accomplishments like 'break a vase'.
Given these observations, one can easily see that the application of the CM operator to two different types of MMPF accomplishments will have different consequences. The operator extracts non-final stages of the activity as occurring in the base world. For 'tear a thread', 'weak up Ivan', etc., the resulting event predicate in will denote activities consisting of atomic subevents on which the change of state (not occurring in the base world) is not causally dependent, that are not causally dependent on each other and allow any temporal ordering. For 'shoot a captive', 'tirn the light off', etc., this is not the case.

Надо написать, что сказанное о MMFP предикатах и их отличиях от тех, которые не имеют некульминирующих интерпретаций, распространяется и на INCR.

(28) $\text{wake}_A(e) \rightarrow \exists Q[\forall e'[Q(e') \rightarrow \ e' <_{NF} e \land \text{G-HOM}(Q)]$

ГЕНИАЛЬНО

МЫ ВВОДИМ ОГРАНИЧЕНИЯ НА СТРУКТУРУ ПРЕДИКАТОВ С ИНДЕКСОМ А.

These subevents can be arranged in any temporal order, and whatever subevent occurs, this does not contribute to the progress of the overall breaking-the-vase event, because the change of state does not causally depend on them. CM(‖break a vase‖) is thus not inherently ordered.

Applying the CM operator to 'shoot a captive', 'give out a book', etc., would also extract a proper non-final stage of the activity. However, since the whole activity is inherently ordered, the extracted part, CM(‖shoot a captive‖), CM(‖give out a book‖), etc., will be ordered, too. For CM(‖shoot a captive‖), for example, the base world can happen to contain loading a bullet and taking aim only. Still, these subevents has to occur in this exact order, and the overall shooting event will be causally dependent on both of them.

Note that the lexical meaning of INCR accomplishments, as Rothstein (2004) conclusively shows, does not impose any inherent ordering on the activity subevent. It is only structured indirectly, through the mapping from the structured become subevent to the activity, as shown in (38). Accomplishments that do combine with *po-* — MMFP predicates like 'break a vase' and INCR predicates like 'read a book' or 'assemble in the form' in (8b) — thus form a natural class: they denote complex events with the activity component not inherently ordered.

wasja kniZkane salgon
вася клал (положил) книгу

poris peDek ijeven
Boris sent a letter

      b. ¬H-PARTS(wake$_A$)