

D. Altshuler’s “A Typology of Partitive Aspectual Operators” (Natural Language Linguistic Theory (2014) 32: 735-775).

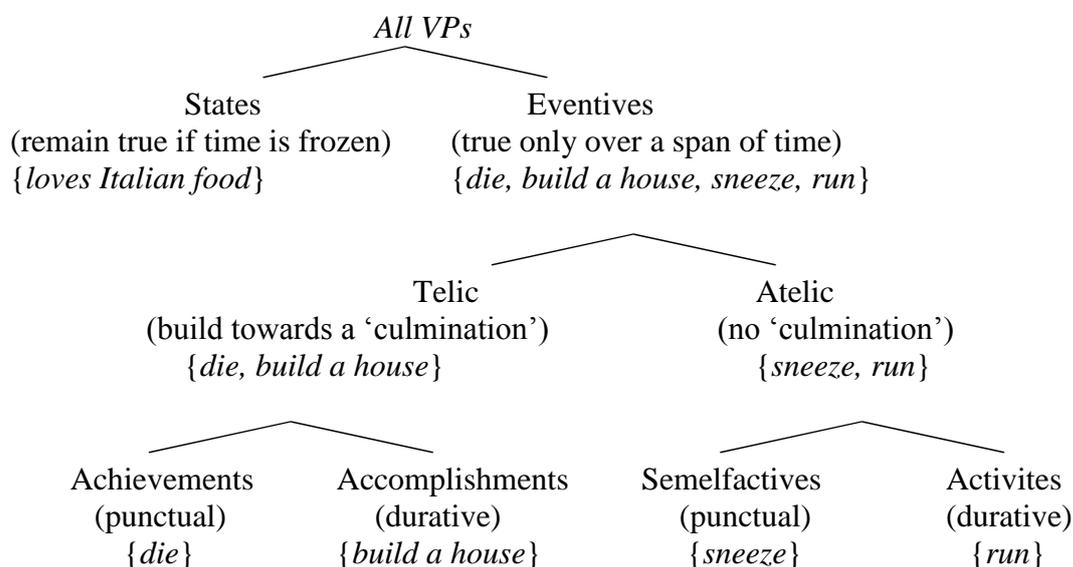
Altshuler (2014) discusses issues related to the interaction of viewpoint aspect and aktionsart, in particular how this interaction helps us understand the nature of PFV and IMPF. So, at the beginning let’s have a brief look at what they are.

1. Aktionsart and viewpoint aspect (short overview)

1.1 Aktionsart (also sometimes referred to as “lexical aspect”)

A grammatically relevant semantic property of a VP (in many languages, e.g. in English) related to the specifics of the eventuality described by the VP:

Categorization of VPs w.r.t to their Aktionsart (*Seth’s handout 3, p. 13*)



1.2 Viewpoint aspect (Perfective, Imperfective, Perfect)

Locates the time of event described by the VP (ET) in relation to the topic (or reference) time (TT) introduced by tense:

- IMPF → ET surrounds TT (TT ⊆ ET)
- PFV → TT surrounds ET (ET ⊆ TT)
- PERF → ET precedes TT (ET < TT)

But, before we look at real problems, let’s review some common approaches to the formal compositional semantics of viewpoint aspect.

2. The semantics of perfective and imperfective aspect (the standard (Kleinian) account):

Consider the following sentences from Russian

- (1) Maša dočítala poslednie stročki pis'ma.
Masha finish-reading.PFV.PAST last lines letter.Gen.

‘Masha finished reading the last lines of the letter’.

- (1') ... #no ne pročítala ih do konca.
... but not read.PFV.PAST them till end.

‘... #but did not read them to the end’.

- (2) Maša dočítывala poslednie stročki pis'ma.
Masha finish-reading.IMPF.PAST last lines letter.Gen.

‘Masha was finishing reading the last lines of the letter’.

- (2') ... none pročítala ih do konca.
... but not read.PFV.PAST them till end.

‘...but did not read them to the end’.

In (1) the verb *dočítala* (finish reading) is perfective. (1) entails that the described eventuality culminated. This is why (1) cannot be continued with (1').

In (2), on the other hand, the verb *dočítывala* (finish reading) is imperfective. (2) does not entail that the described event culminated. This is why (2) can have (2') as its continuation.

The standard Kleinian semantics can capture these observations.

$$(3) \|\text{PFV}\|^{w,t,g} = [\lambda P_{\langle e,t \rangle} . \lambda t' . \exists e (P(e) \wedge \tau(e) \subseteq t')]$$

$$(4) \|\text{IMPF}\|^{w,t,g} = [\lambda P_{\langle e,t \rangle} . \lambda t' . \forall w' (w' \in \text{INERTIA}(w,t') \rightarrow \exists e (P(e,w') \wedge t' \subseteq \tau(e)))]$$

In a perfective sentence like (1) the event has to occur within the topic time interval introduced by tense, hence a culmination entailment.

In an imperfective sentence like (2) ET surrounds TT, the event has to culminate in the inertia worlds of w but can cease to develop in w . Hence, no culmination entailment.

3. Problems for the standard account

Russian has imperfective sentences which entail event culmination:

- (5) K nam priezžal otec.
To us come-to-visit.IMPF.PAST father

‘Father came to visit us’

- (5') ...#no tak i ne priehal.
...but so and not come.PFV.PAST

‘... but in the end he didn’t make it’.

Hindi has perfective sentences which entail event culmination (as it should be expected):

- (6) pitaa-jii hamaare ghar aa-ye
father our house come.PFV

‘Father came to our house’

- (6') #lekin hamaara ghar nahiiN DhuunD sake
but our house not find could

‘...but was unable to find our house’.

but it also has perfective sentences which do not:

- (7) maayaa-ne biskuT-ko khaa-**yaa**
Maya-ERG cookie-ACC eat.PFV

‘Maya ate the cookie’

- (7') par use puuraa nahiin khaa-yaa
but it.ACC finish not eat.PFV

‘but did not finish it’

We, thus, find ourselves in a situation where IMPF sometimes entails event culmination, and PFV sometimes does not. And these facts do not seem to be accounted for by the semantics in (3) and (4).

A move that has often been taken in order to deal with such treatments was to introduce a so-called *neutral aspect* compatible with an event culmination and its non-culmination, as it is the case with the Russian suffix **-yva** as in (2) (without the continuation in (2')) or with the suffix **-yaa** in Hindi).

We can, thus, find ourselves in a jungle filled with all kinds of beasts whose nature is not clear. And all this talk of special kinds of IMPF and PFV is obviously problematic because we are losing a clear understanding of what is happening in the semantics of aspect and why exactly it is happening. But, crucially, we are also losing an understanding of what PFV and IMPF really stand for.

The Russian suffix *-yva* is called (secondary) imperfective. When applied to accomplishment verbs (as in (2)) it does not entail event culmination. However, if a secondary imperfective is an achievement the culmination is entailed (as in (5)¹).

The Hindi suffix *-yaa* is called perfective. When applied to an accomplishment verb it does not entail culmination (as in (7)). When applied to an achievement verb (as in (6)² the culmination is entailed.

PROBLEM: how can this identical logical behavior be associated with a something PFV in one language and something IMPF in another?

4. The main objective of Altshuler (2014)

The main objective is to provide a uniform explanation of the semantic contribution of imperfective and perfective aspectual morphology (aspectual operators) in such unrelated languages as Russian and Hindi. This uniform treatment aims to account for simple as well as for the well-known problematic cases in both languages. The treatment does not appeal to a so-called neutral aspect.

That is: show how the facts about the PFV and IMPF above can be accounted for without appealing to such things as the neutral aspect (and other ‘suspicious’ creatures) and with preserving a clear definition of PFV and IMPF which would be in accordance with the popular view: the *-yva* in Russian will remain an imperfective operator, whereas the *-yaa* in Hindi will remain a perfective operator.

Moreover, the proposed story will have implications outside Russian and Hindi. It will provide us with a means to explain why, unlike IMPF in Russian which can be associated with completive readings, PROG in English, which is often regarded as a version of IMPF, can never yield culminations.

Altshuler (2014) shows us

- (a) why Russian IMPF and Hindi PFV *-yaa* can imply culmination with accomplishments
- (b) why English PROG, unlike Russian IMPF, can never entail or even imply a culmination
- (c) why a Russian IMPF can entail event culmination with achievements
- (d) what it means for an operator to be perfective

But before we see how Altshuler (2014) does it, we need to take a brief look at some more facts about Russian and Hindi.

¹ No suffix *-yva* here, but the verb is secondary imperfective (derived from a perfective).

² No suffix *-yaa* here, but *-ye* is a variant of *-yaa*.

5. A closer look at the data in Russian and Hindi

5.1 Russian

5.1.1 Aspectual system of Russian: brief overview

Every verbal form in Russian is either perfective or imperfective. Imperfective verbs can be made perfective by adding a perfective prefix:

delat'	→	sdelat'
do.IMPF		[PFV[do.IMPF]]
'to be doing'		'to have done'

Perfective verbs turn into imperfective ones when they combine with the suffix –yva or its phonological variants:

vsplyt'	→	vsplyvat'
surface.PFV		[[surface.PFV]IMPF]
'to have surfaced'		'to be surfacing'

The function of the suffix –yva is often referred to as the *secondary imperfectivization* because it is considered to make an initially imperfective form which was made perfective again imperfective. Altshuler (2014) lists some examples like the following one:

pisat'	za-pisat'	za-pis-yva-t'
write.IMPF	[PFV-[write.IMPF]]	[[PFV-[write.IMPF]]-IMPF]
'to write'	'to write down'	'to be writing down'

5.1.2 Factual imperfective in Russian – imperfective with associated (entailed or implied) culmination:

Consider the verb *čital* (read.IMPF.PAST) and *priežžal* from (5) above

- *čital* is an activity verb, *priežžal* is an achievement verb
- both are associated with culmination: *priežžal* in (5) entails it, but *čital* in

(8) Ja čital "Vojnu i mir"
I read.IMPF.PAST "War and Peace"

'I've read *War and Peace*'

is said to merely imply it (by implicature).

- *čital* – primary IMPF, *priežžal* – secondary IMPF

- Hypothesis about IMPF achievements: they are all derived secondary IMPF

- Culmination entailment hypothesis for Russian: achievements in IMPF entail culmination

- Therefore: IMPF (-yva) entails culmination if it is derived from a PFV which describes a culmination (achievements) – (see more on p. 745 on the specifics of achievements); primary IMPF (like *čital*) do not entail, but only pragmatically implicate a culmination.

To conclude: among all IMPF VPs only IMPF achievements (derived from telic perfectives and being secondary imperfectives) entail culminations.

5.2 Hindi

- Hindi has simplex (SV) and complex (CV) perfectives (p. 746). Example (7) above is an example of an SV. CVs contain an additional light verb and are never compatible with incomplete events.

- SVs, as we saw in (6) entail culmination with achievement verbs.

Hence,

Culmination entailment hypothesis for Hindi: if an application of a ^{SV}PFV to an achievement predicate entails culmination.

6. Partitive aspectual operators in Russian and Hindi and the semantics of PROG in English

6.1 Stages vs. parts of events:

- events can be ordered by a part-of relation and by a stage-of relation (Landman (1992))
- all stages are also parts of events: “to be a stage, a part has to be big enough and share enough with [an event] e so that we can call it a less developed version of e”
- Rothstein (1999): “My frying onions and my listening to the radio may both be part of the event of my making fried rice, but only the first is a stage of it”.

6.2 Landman (1992) on PROG:

- PROG as a function from sets of events to sets of their stages (not parts)
- Entailments: no problem for activities but problems for accomplishments – *imperfective paradox* (no culmination entailed)
- Culmination in inertia worlds as part of a T-conditions of a sentence with PROG
- * Note on reasonable options for inertia worlds.

Meaning of PROG in Landman (1992) (Altshuler (2014: 752):

- (9) a. $\text{PROG} \sim \lambda P \lambda e' \exists e \exists w [\text{STAGE}(e', e, w^*, w, P)]$
 b. $\| \text{STAGE}(e', e, w^*, w, P) \|^{M,g} = 1$ iff (i)-(iv) holds:
 (i) the history of $g(w)$ is the same as the history of $g(w^*)$ up to and including $\tau(g(e'))$
 (ii) $g(w)$ is a reasonable option for $g(e')$ in $g(w^*)$
 (iii) $\| P \|^{M,g}(e, w) = 1$
 (iv) $g(e') \subseteq g(e)$

Observation: PROG and achievements do not combine:

(10) *Mary is spotting her friend at the party.

- Rothstein (2004): PROG with achievements
 - o achievements do not have stages
 - o only via coercion of achievements into accomplishments
- Alshuler (2014): achievements do have stages, but their only (atomic) stage is identical to the event itself.

6.3 Semantics for the Russian IMPF and the PFV –yaa in Hindi

The semantics in (8) is rather a semantics for the Russian IMPF and the PFV –yaa in Hindi:

- (11) a. $\text{Op} \sim \lambda P \lambda e' \exists e \exists w [STAGE(e', e, w^*, w, P)]$
b. $\|STAGE(e', e, w^*, w, P)\|^{M,g} = 1$ iff (i)-(iv) holds:
(i) the history of $g(w)$ is the same as the history of $g(w^*)$ up to and including $\tau(g(e'))$
(ii) $g(w)$ is a reasonable option for $g(e')$ in $g(w^*)$
(iii) $\|P\|^{M,g}(e,w) = 1$
(iv) $g(e') \subseteq g(e)$

This means that the Russian IMPF and the PFV –yaa in Hindi

- are partitive aspectual operators (combine with stages of events)
- can be compatible with complete events (due to the substage relation \subseteq)
- in case of an accomplishment VP apply to the only substage it has (which is the event itself)

6.4 The semantics for PROG in English

- has to account for the incompatibility of PROG with achievements
- its incompatibility with completed events

Solution: have PROG apply only to the *proper* substages of the events described by the VP

- (12) a. $\text{PROG} \sim \lambda P \lambda e' \exists e \exists w [STAGE(e', e, w^*, w, P)]$
b. $\|STAGE(e', e, w^*, w, P)\|^{M,g} = 1$ iff (i)-(iv) holds:
(i) the history of $g(w)$ is the same as the history of $g(w^*)$ up to and including $\tau(g(e'))$
(ii) $g(w)$ is a reasonable option for $g(e')$ in $g(w^*)$
(iii) $\|P\|^{M,g}(e,w) = 1$
(iv) $g(e') \subset g(e)$

6.5 What does this all mean?

The differences in the semantics of PROG and the partitive aspectual operators in Russian and Hindi can be captured in the following table:

<i>Partitive operator</i>	<i>Proper VP-event stage?</i>
Hindi ^{SV} PFV	No
RussianIMPF	No
EnglishPROG	Yes

This typology explains (a) and (b) on p. 4 above.

Together with the fact the proposed analysis of achievement verbs Altshuler explains (c).

WE HAVE, THUS, COVERED (a), (b), (c) ABOVE. IT REMAINS TO COVER (d).

7. What makes an operator perfective is the maximal stage requirement

We saw above that IMPF in Russian, as well as PFV –yaa in Hindi do not entail event culmination when applied to non-achievement verbs. But, interestingly, Russian IMPF can be used with the meaning of PROG and Hindi –yaa cannot (from Altshuler’s (2014) examples (66) and (68)):

- (13) Ja el tort, i sejčas prodolžaju ego est’
I eat.IMPF.PST cake and now continue it eat.INF.

‘I was eating the cake and now I am still eating it’

- (14) #maayaa-ne biskuT-ko khaa-yaa aur use ab tak khaa hahii hai.
Maya-ERG cookie eat.PFV.PAST and it still eat Prog be.PRS

Intended: ‘Maya was eating the cookie, and is still eating it’.

If so, there has to be some restriction that –yaa obeys and which disallows its use with a progressive meaning.

Maximal stage requirement: if a VP denotes an event in w such that P , there can be event e' in w such that e is a subevent of e' and e' is also P . Whatever an operator with MAXSTAGE requirement applies to must be either completed or not developing further.

More formally: for all events e'' , if e'' properly contains the VP-event part denoted by e' and is at least a sub-part of the VP-event denoted by e , then e'' does not satisfy the description denoted by the VP in w^* .

Even more formally:

- (15) a. PFV (-yaa) $\sim \lambda P \lambda e' \exists e \exists w [MAXSTAGE(e', e, w^*, w, P)]$
 b. $\|MAXSTAGE(e', e, w^*, w, P)\|^{M,g} = 1$ iff (i)-(v) holds:
 (i) the history of $g(w)$ is the same as the history of $g(w^*)$ up to and including $\tau(g(e'))$
 (ii) $g(w)$ is a reasonable option for $g(e')$ in $g(w^*)$
 (iii) $\|P\|^{M,g}(e, w) = 1$
 (iv) $g(e') \subset g(e)$
 (v) $\forall e'' [(g(e') \subseteq e'' \wedge e'' \subset g(e)) \rightarrow \|P\|^{M,g}(e'', w^*) = 0]$

It turns out that an operator perfective is the maximal stage requirement. –yaa in Hindi does have this requirement and it is therefore perfective. Russian IMPF does not have it and it is, thus, imperfective. This is expressed in

(16)

<i>Partitive operator</i>	<i>Maximal stage?</i>
Hindi ^{SV} PFV	Yes
RussianIMPF	No
EnglishPROG	No

This definition of PFV and IMPF allows us to account for why Hindi^{SV}PFV and RussianIMPF both are compatible with a culminating and non-culminating readings: neither requires culmination, and neither (unlike English PROG) applies only to proper substages. But, at the same time, the Hindi –yaa is be perfective because it contains the Maximal stage requirement.

We, thus, get an explanation for (d) on p. 4 above and the following typology:

From Fig. 2, p. 762

<i>Partitive operator</i>	<i>Proper VP-event stage?</i>	<i>Maximal stage?</i>
Hindi ^{SV} PFV	No	Yes
RussianIMPF	No	No
EnglishPROG	Yes	No

8. The Culmination implicature puzzle

- Discussion of the question why IMPF in Russian (and PFV-SV in Hindi) implicate culmination to begin with.
- Two reasons:
 - o PFV is ruled out
 - PFV has a resultative meaning (the window has to be still open)
 - PFV moves the narrative forward
 - o Discourse coherence
 - Elaboration in example 97ab: since PFV and IMPF describe the same event IMPF is treated as being associated with a culminated event

9. Some issues and questions for critical discussion:

- Achievement verbs can be used in Present tense...
- Cancellation of a culmination with a verb like *čital* work only if *čital* is interpreted duratively, which changes its original factual meaning. How can this be a test for implicature?
- It seems to me that *Neg+čital* doesn't always have to entail no reading whatsoever...
- On p. 763 the formulation of hypothesis of (im)perfective operators suggests that an imperfective operator requires a part of an event. Problem – the lobster apron counterexample.
- Discussion of resultative meaning of PFV and a resulting pragmatic strengthening of IMPF seems problematic because (i) PFV is also OK in contexts when the window is already closed.
- Moving the narrative forward: compatible with ambiguity of IMPF between durative and factual meaning with the latter being incompatible with non-quantificational temporal adverbial modifiers.