Towards a unified semantics of Russian aspect

Introduction. There exists an immense amount of work done on Russian aspectology, and I do not wish to meaninglessly increase it. However, of all the analyses of the Russian perfective and imperfective, not one has left linguists satisfied. Most work is descriptive (for a good example, see Forsyth 1970), and the best attempts of formal analyses seem to be fatally flawed in one way or another (see Klein 1995, Padućeva 1996, Gronn 2003, and Altschuler 2014).

In this work, I propose an analysis that successfully defines Russian imperfective and perfective operators, albeit for a restricted linguistic environment: accomplishments in the past tense. This restriction, however, is strategic: accomplishments exhibit the clearest examples of what makes Russian aspect problematic, and the past tense avoids extra problems such as modality to come interfere with the analysis. Since this restricted analysis describes a subphenomenon of the global Russian imperfective and perfective, it is my hope that it will extend to other situation types and tenses with at most minor revisions.

Background. Russian encodes aspect under two morphological forms, typically associated with perfective and imperfective. We generally observe pairs of morphologically linked verbs describing the same or similar situation types. For example:

ˇcitat’ (IPF) - proˇcitat’ (PF)
to read - to read all of

Russian perfective and imperfective display properties observed cross-linguistically:

<table>
<thead>
<tr>
<th>Perfective</th>
<th>Imperfective</th>
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<tbody>
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<td>boundedness, completion, punctuality</td>
<td>unboundedness, processuality, repetition</td>
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(1) Ya pro-ˇcital Annu Kareninu.  
I all-read\(^{PF}\) Anna Karenina.  
I read Anna Karenina.

(2) Včera ya čital Annu Kareninu.  
Yesterday I read\(^{IPF}\) Anna Karenina.  
Yesterday, I was reading Anna Karenina.

There have been many popular cross-linguistic analyses that satisfying account for these characteristics (for example, ‘viewpoint aspect’, popularized by Smith 1990). What is it, then, that makes Russian so problematic? The answer is: factual imperfective. Along with the usages mentioned above, Russian imperfective is commonly used to refer to an event in its totality. This is puzzling, because it is a characteristic that is usually attributed to the perfective, both in Russian and cross-linguistically. In fact, as in the following, imperfective can even have a past perfect interpretation:

(3) Ya čital Annu Kareninu.  
I read\(^{IPF}\) Anna Karenina.  
I (have) read Anna Karenina.

This ‘factual’ usage of the imperfective raises two main questions:
1. the relationship between factual imperfective and the other meanings of imperfective: are there two distinct operators or can their semantics be merged, and how?
2. the relationship between factual imperfective and perfective: why use one instead of the other, when both seem to be able to refer to an event in its totality?

Analysis. I propose an imperfective operator IPF that unifies the factual and conventional usages of the imperfective, as well as a perfective operator PF that brings out the contrast between factual imperfective and perfective.

1. Imperfective: the accommodating aspect. The Russian imperfective is an operator that takes an eventuality description \(P\) and a reference time \(t\) as input, and tries to fit in as much of a maximal eventuality described by \(P\) as possible within the given reference time.

\[
\text{IPF} = \lambda P \lambda t [e_0 \subseteq e | P_m(e), \tau(e_0) \subseteq t]
\]

where \(P_m(e)\) is the set of maximal eventualities described by the predicate \(P\); and \(\tau(e)\) is the temporal trace of an eventuality \(e\) (i.e. the time for which \(e\) occurs).
Let us check IPF’s concrete action. Since we restrict our analysis to accomplishments, \( P \) will be the description of an accomplishment, that we can abstractly represent as such: \( \bullet \rightarrow \bullet \), where the starting point of the event is \( \bullet \) and the culmination of the event is \( \bullet \). As for the reference time \( t \), it can either be a point in time (eg: ‘when he entered’; ‘at noon’), or an interval in time (eg: ‘yesterday’; ‘when I was a child’; all past time from evaluation time, which can be implicit, or introduced, for example, by ‘already’). Entering these reference times combined with the accomplishment in the IPF operator:

\[
\begin{align*}
\text{a) } & \text{IPF}(\bullet \rightarrow \bullet, [t > \tau(\bullet \rightarrow \bullet)]) = \bullet \rightarrow \bullet \Rightarrow \text{factual} \\
\text{b) } & \text{IPF}(\bullet \rightarrow \bullet, [t < \tau(\bullet \rightarrow \bullet)]) = \bullet \Rightarrow \text{processual} \\
\text{c) } & \text{IPF}(\bullet \rightarrow \bullet, t = \text{point}) = \bullet \Rightarrow \bullet \Rightarrow \text{processual}
\end{align*}
\]

Explanation for these derivations:

a) The reference time is an interval bigger than the temporal trace of the accomplishment. IPF thus allows the whole eventuality to be asserted. This is factual imperfective. For example:

\[\text{Ya čitala}^{IPF} \text{ Anna Kareninu v prošlom godu.} \]

‘I read Anna Karenina last year.’

This sentence entails that the reading of Anna Karenina was completed, because a year is presumably enough to read a book.

b) The reference time is an interval smaller than the temporal trace of the accomplishment. IPF cannot fit the whole accomplishment into the interval, but accommodates part of it. This entails a processual reading. For example:

\[\text{Ya čitala}^{IPF} \text{ Anna Kareninu včera.} \]

‘I was reading Anna Karenina yesterday.’

One day is presumably not enough to read all of Anna Karenina, thus the reading is processual.

c) The reference time is a point. Only one point of the accomplishment can fit in the reference time. It will pick a random point (thus not an endpoint), which will be a point taken from the interior of the accomplishment, which will be processual. A process, by definition, cannot be reduced to a single point, thus, from one process point we can infer a process interval. The resulting meaning will thus be processual.

\[\text{Kogda on voshol, ya čitala}^{IPF} \text{ Anna Kareninu.} \]

‘When he entered, I was reading Anna Karenina.’

2. Perfective: the aggressive aspect. Russian perfective operators also take an eventuality description and a reference time as input. Instead of depending on the size of the interval only for the inclusion of the event, perfective coerces the whole event into the input reference time (no matter how small it is). The lexical entry of for the Russian perfective operator:

\[PF = \lambda P \lambda t [e[P_m(e), \tau(e) \subseteq t]]\]

I will not go into the details of the action of PF here, but here is a paradigmatic example:

\[\text{Ya pročitala}^{PF} \text{ Anna Kareninu včera.} \]

‘I read (all of) Anna Karenina yesterday.’

Despite the small reference time, we understand that the whole event of reading Anna Karenina was completed within a day, thanks to the action of the perfective operator.

Conclusions. This work proposes a way of formally unifying the different usages of the Russian imperfective, while contrasting them with the usages of the perfective. While I have limited my research for now to accomplishments in the past tense, it forges the way for further investigation towards formally defining Russian IPF and PF operators that extend to all situations, and will hopefully also provide insights about aspect cross-linguistically.