Chapter 23

The morphosemantics of Russian aspect

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Compositional semantic analyses of Slavic aspect face the challenge that no clear morphological exponents of perfective or imperfective can be identified on the verb. Against this background, the present article, concentrating on the case of Russian, pursues two goals. The first is to provide an overview of formal semantic analyses that answer the question of which parts of verbal morphology carry which meaning. The second aim is to present a new formal semantic analysis, stated within the theoretical framework of discourse representation theory (DRT), which makes do with a single aspectual null operator. Unlike previous theories of this kind, the new approach relies on state change (rather than quantisation) as the relevant lexical aspectual feature, and it presupposes time intervals (rather than time points) as relevant temporal units in the model. It is shown in detail how the new proposal can explain the range of (im)perfective readings identified in traditional Russian aspectology.

1 Introduction

A lot of literature has been devoted to the form and function of Russian verbal aspect.[1] Let me therefore emphasise that in this chapter, I will be concerned with the relationship between morphology and semantics of Russian aspect exclusively from a compositional semantic perspective. The following discussion will concentrate only on studies that approach the topic from this theoretical

[1]This chapter is about theories on Russian aspect only. Whether and in how far the results of the discussion presented below take over to other Slavic languages remains to be seen. Although the aspectual systems of the Slavic languages resemble each other from a coarse-grained perspective, they differ in many relevant details. Inner-Slavic aspectual variation can be found in semantics as well as in morphosyntax (e.g. Dickey 2000, Petruchina 2012).

Olav Mueller-Reichau. The morphosemantics of Russian aspect. To appear in: Change Volume Editor & in localcommands.tex Change volume title in localcommands.tex Berlin: Language Science Press. [preliminary page numbering]

perspective. Even with this confinement, such a survey must necessarily be selective.

Within formal (compositional) semantics, Russian aspect is usually modelled as an operation over verbal meanings. Approaches disagree as to whether the syntactic constituent carrying the "verbal meaning" is a VP or a V (see Rothstein (2020) for recent discussion). Another parameter with respect to which theories differ from each other relates to morphology. As is well-known, there are no uncontroversial perfective or imperfective morphemes in Russian, that is to say, there are no necessary and sufficient markers of perfective or imperfective meaning.[2] Prefixes, which are not infrequently associated with perfectvity, appear also in imperfective forms (1a), and the secondary imperfective suffix, which seems to suggest itself as exponent of imperfectivity, shows up in perfective forms as well (1b).

(1) a. ***ot**kryt'*^{PF} 'open' – ***ot**kryvat'*^{IPF} 'open'
b. *otkry**vat'***^{IPF} – *zaotkry**vat'***^{PF} 'start opening'

From a formal semantic perspective, the frequently made assumption that verbal prefixes mark perfectvity faces the problem of how to deal with imperfective verbs like *otkryvat'* in (1). To claim for these that the prefix does not introduce the perfective meaning that it carries in *otkryt'* would run against basic assumptions of compositionality. This problem is maybe even more apparent in aspectual triplets such as (2):

(2) a. *čitat'*^{IPF} 'read' – ***pro**čitat'*^{PF} 'read (through)'
b. ***pro**čitat'*^{PF} – ***pro**čity**vat'***^{IPF} 'read (through)'

If one wanted to maintain that prefixes introduce perfective operators, one would have to come up with a semantics for the imperfective suffix YVA, that, operating on a perfective meaning as input, somehow gets rid of the completedness entailment added by the prefix beforehand.[3] As we will see below, proposals along these lines have been made, notably by Zucchi (1999) and Grønn (2004).

The alternative is to free prefixes from expressing perfectivity. This position, which has first been argued for in Filip (1992), has widely become accepted in formal Slavic linguistics, and it is also prominently advocated in non-formal aspectology (e.g. Plungjan 2011). If prefixes cannot be considered as exponents of

[2] To the exception of semelfactive *nu*, from which I abstract away here.

[3] I use "YVA" as a handy term to refer to the operator the application of which manifests itself morphologically as suffixation. Subject to laws of morphonology, it can show up as *-yva, -iva, -va, -á*, among further options (e.g. Švedova et al. 1980, Zaliznjak & Šmelev 1997).

perfectivity, no overt structure will be left that could serve this function, and there seems to be no way around the conclusion that perfectivity has zero exponence.

A second often made assumption is that the secondary imperfective suffix be a marker of imperfectivity, hence its name. This position faces two theoretical challenges. The first relates to verbs like *zaotkryvat'* in (1b). Why should a perfective form contain an imperfective marker? The second is the absence of imperfectives like *zakrikivat'*:

(3) a. *kričat'*^{IPF} 'scream' – *zakričat'*^{PF} 'start screaming'
b. *zakričat'*^{PF} – **zakrikivat'*^{IPF} 'start screaming'

If the secondary imperfective suffix was an imperfectivity marker, why should it not be used to form an imperfective form of the perfective *zakričat'*? Even if one could somehow show that the meaning 'to be starting to scream' was semantically ill-formed (which I believe it is not), there is definitely no conceptual obstacle for an iterative construal, i.e. for a meaning like 'to repeatedly start screaming'. Yet the form *zakrikivat'* is ungrammatical (Tatevosov 2013: 63). In contrast to that, the imperfective form *zapevat'* from perfective *zapet'* ('start singing') is perfectly fine.

To sum up so far, every compositional semantic approach to Russian aspect has to address the problem that Russian verb morphology does not seem to provide clear markers that could be made responsible for introducing perfective or imperfective meaning components into semantic structure. As Schoorlemmer (1995: 153) puts it: "aspectual morphology in Russian presents a problem from whatever angle you look at it".

In the sections to follow, I will briefly recapitulate formal semantic approaches that explicitly address the "aspectual morphology problem". Given this scope, I have to set aside a lot of important work in Russian aspectology. This concerns not only the whole cosmos of non-formal theories, but also those formal semantic studies that present meanings for perfective and imperfective aspect, but remain silent as to the morphological source of aspect information.

As for the latter, to name just two, I will not go into the details of Borik (2006) and Paslawska & von Stechow (2003). Borik (2006: 166-167) arrives at the conclusion that a Russian perfective form expresses the two conditions of (i) non-overlap of reference time[4] and speech time, and (ii) inclusion of event time in reference time. The Russian verb is thereby treated as a ready-made word, which

[4]Different authors use different terminology to designate what Borik (2006), following the tradition of Reichenbach (1947), refers to as reference time. In the exposition below, I will use "topic

the author acknowledges right from the start: "issues of aspectual morphology [...] will not be thoroughly discussed in this work" (Borik 2006: 3). The same could be said about Paslawska & von Stechow (2003). In their seminal study, the authors take it as given that Russian verbs bear morphological aspects, perfective or imperfective, that license semantic aspects. Perfective verbs license INCLUDES, which requires that the run time of the event must fall into (or equal) the topic time interval, or POST, which says that the topic time interval has to start after the event time is over (cf. Paslawska & von Stechow 2003: 322). Both these works consider the imperfective to be semantically unmarked, standing in a privative opposition to the perfective (cf. Paslawska & von Stechow 2003: 336, Borik 2006: 186).

The "aspectual morphology problem" does not imply that it would be difficult to establish the aspect of a given verb. There is a long-standing set of diagnostics, which I reproduce here in the version of Ramchand (2008: 1698). As pointed out in Zinova (2021: 22), most of these tests provide contexts from which perfectives are excluded:[5]

(4) A perfective predicate...
   a. ... cannot get simple ongoing interpretations in the present tense
   b. ... cannot be used as the complement of a phasal verb such as *načat'* ('to begin'), *prodolžat'* ('to continue') or *končit'* ('to finish')
   c. ... cannot form a present present participle
   d. ... combines with another perfective predicate to form non-overlapping events in narrative discourse

The present paper consists of two parts. In the first (§2) I will discuss different proposals that have been made to deal with the morphosemantics of Russian aspect. Specifically, I will present (hopefully fair) summaries of the studies Zucchi (1999), Grønn (2008b), Filip (2000; 2008), Altshuler (2014), Tatevosov (2011; 2015; 2017), Bohnemeyer & Swift (2004) and Ramchand (2004; 2008).

time" throughout, indicating where the authors discussed themselves say "reference time" or "assertion time".

[5]Note that generalization (4d) seems premature in view of examples like (i), where the three events do overlap (they start simultaneously), see Dickey (2000: 224):

(i) *Zagudeli, zavorčali, zakričali.*
start_hooting.PST.PFV start_grumbling.PST.PFV start_shouting.PST.PFV
'They started hooting, grumbling and shouting.'

In the second part (§3) I will outline my own proposal, which combines insights from the theories discussed before. In a nutshell, my approach is time-relational with topic times (aka reference times, see fn. 4) being modelled as intervals, it relies on the notion of state change, it makes do with a single default aspect operator, and it treats YVA as applying below the aspect operator. It should be noted that I will exclude semelfactives from consideration, that I will not say much about habituals and that I will only scratch the surface of external prefixation toward the end of this paper.

2 Theories of Russian aspect

2.1 Zucchi (1999)

The examples that Zucchi (1999) uses to explain his theory are the simple imperfective *pisat'* ('write'), the prefixed perfectives *napisat'* ('write down') and *vypisat'* ('write out'), and the suffixed imperfective *vypisyvat'* ('write out').[6] In a nutshell, the semantics of a prefix (like *na-* in *napisat'* or *vy-* in *vypisat'*) is a function mapping a predicate of complete and incomplete events onto a predicate of complete events, while the imperfective suffix *-yva-* (in *vypisyvat'*) semantically maps a predicate of complete events onto a predicate of complete and incomplete events.

Zucchi (1999) demonstrates that, in principle, both Landman's (1992) and Parsons's (1990) theories may be used to formalise this basic idea. Whichever theory one chooses, however, at a certain point it will be necessary to adopt some component of the opposing theory in order to arrive at a proper account of the Russian facts. Below I will recapitulate the Parsons-style semantic translations, indicating where the Landman-component must be added.

The semantics assumed for the imperfective verb *pisat'* is given in (5).[7]

(5) $[_{V[+imperfv]}\ \text{pisat'}] \Longrightarrow \lambda Q \lambda x \lambda e[writing(e) \wedge Agent(e, x) \wedge Theme'(e, Q)]$

The prefix *na-* translates as follows:

[6] Zucchi's (1999) analysis of Russian aspect serves to illustrate the more general theoretical point that the proper modeling of imperfectivity calls for the integration of two competing theories in the field, Landman (1992) and Parsons (1990). Here is not the space to go into this. Instead, I will only give an outline of the specific proposal regarding Russian aspect semantics.

[7] The variable Q denotes a generalised quantifier intension. The reason is that "if John is writing a letter, the letter comes into existence only when the writing event is completed" (Zucchi 1999: 198). Since the events described by the imperfective form *pisat'* need not be complete, the direct object of *pisat'* should be assigned an intensional meaning.

(6) $[_{V[+pfv]}$ na- $[_{V[+impfv]}\alpha\ ]]$
$\Rightarrow \lambda Q \lambda x \lambda e \lambda t[\alpha'(Q)(x)(e) \wedge Cul(e, t, ^\wedge \alpha'(Q)(x))]$

Applying this meaning of *na-* to the meaning of *pisat'* will yield (7).

(7) $[_{V[+pfv]}$ napisat'$] \Rightarrow \lambda Q \lambda x \lambda e \lambda t$[writing($e$)$\wedge$Agent($e$, x)$\wedge$Theme'(e, Q)$\wedge$
Cul(e, t,$^\wedge$ λe[writing(e)$\wedge$Agent(e, x)$\wedge$Theme'(e, Q)])]

As can be seen, the meaning of *napisat'* is correctly derived as perfective, for which in Parsons's (1990) theory the predicate Cul is responsible.[8] The culmination condition is fed into semantic composition by the prefix *na-*.

So far, a sentence with *napisat'* will come out as having an intensional theme participant. This is incorrect, however, because culminated writing events entail the existence of a specific product of writing. To close this gap, Zucchi (1999) adds the following meaning postulate ("The Writing Principle"):

(8) $\forall e \forall t \forall x \forall Q$[Cul($e$, t, $^\wedge \lambda e$[writing(e)$\wedge$Agent(e, x)$\wedge$Theme'(e, Q)])
$\rightarrow$ (Theme'(e, Q) $\leftrightarrow$ $^\vee Q\, \lambda y$(Theme*(e, y)))]

As for *vy-* and *vypisat'*, Zucchi (1999) refrains from giving precise semantic translations, being aware of the complexity of the task. Instead, he only presents the meaning postulate in (9). It tells us that the truth of a sentence with *vypisat'* as predicate will always entail the culmination of an event at t relative to the event type of writing-out:

(9) $\forall e \forall x \forall Q$[write-out($Q$)($x$)($e$) $\rightarrow$Cul(e, t, $^\wedge$write-out'(Q)(x))]]

Thus, *vypisat'* will impose on interpretation the culmination condition, which was added to the meaning of *vypisat'* by the prefix *vy-*. Now the question arises: how to state the semantics of the suffix *-yva* such that it will, so to speak, get rid of the culmination interpretation again. A sentence based on the predicate *vypisyvat'* does not require the event to culminate, after all. The solution is found in the theory of Landman (1992), whose imperfective operator PROG relates actual events to possible events. Zucchi (1999) proposes to incorporate this feature into Parsons's (1990) theory. Specifically, since imperfectivity is taken care of by the predicate Hold in Parsons (1990), it is the content of Hold that has to be redefined accordingly (cf. Zucchi 1999: 194):

[8] Zucchi (1999) argues that Cul expresses the requirement of an eventuality e culminating at a time t relative to an eventuality type. On Parsons's (1990) original account, Cul is merely a binary relation between e and t.

(10) $[\![Hold(e, t, {}^{\wedge}P)]\!]_{w,g} = 1$ iff $\exists e' \exists w' \exists t'$ such that
$\langle e', w' \rangle \in CON(g(e), w, [\![{}^{\wedge}P]\!]_{w,g})$ and $[\![Cul(e, t, {}^{\wedge}P)]\!]_{w',g[e/e',t/t']} = 1$

This says, roughly, that the relation Hold will hold of an event e, a time t and a property in some world w if e culminates at t relative to some other world w' in which there is an event e' that traverses along a continuation branch of e.[9]

With this recalibration of Hold, the meaning of *-yva* is now stated as follows:

(11) $[_{V[+impfv]}[_{V[+pfv]}\alpha]$ -yva-$] \Longrightarrow \lambda Q \lambda x \lambda e \lambda t[Hold(e, t, {}^{\wedge}\alpha'(Q)(x))]$

Zucchi (1999: 197) writes that "the absence of isolated forms like *pisyvat'* tells us that the imperfective suffix *-yva* takes perfective forms like *vy-pisat'* as inputs". This is, in fact, not true, as *pisyvat'* does exist in Russian, see (50) below. In defence of his analysis the author could argue that *-yva* in *pisyvat'* is not the same as *-yva* in *vypisyvat'*, despite their homonomy. A more serious issue arises in view of perfective verbs that result from further prefixing an already prefixed perfective. Examples are *perezapisat'* ('rerecord'), *podrastajat'* ('melt away a little bit') or *donapisat'* ('finish writing down'), see Tatevosov (2013: 52). Without further modification, Zucchi's (1999) theory would predict such forms to be impossible, because the output of the first prefixation yields the wrong input for the second prefixation.

2.2 Grønn (2004)

Grønn (2004) subscribes to the common view that aspect operates over verbal meanings to relate the topic time (which he calls assertion time) to the time of the event. In his particular proposal there are two aspectual operators, PF and IPF, that map the set of events delivered by the VP onto a set of (topic) times.[10]

(12) a. $PF \Longrightarrow \lambda P \lambda t[e|P(e), e \subseteq t]$
b. $IPF \Longrightarrow \lambda P \lambda t[e|P(e), e \circ t]$

Perhaps most innovative is Grønn's (2004) underspecification analysis of the IPF as introducing the overlap relation $e \circ t$, which is inspired by Klein (1995). This

[9] Here I will not go into the complicated issue of how a continuation branch is to be defined, but see Zucchi (1999: 214) and, of course, Landman (1992).

[10] Letting PF introduce the relation $e \subseteq t$ is nowadays standard (Klein 1994). It is "the notion of temporal inclusion, the central concept for the correct temporal interpretation of perfective morphology, as many researchers believe" (Paslawska & von Stechow 2003: 314). But see Borik (2006) for an entirely different solution.

relation is general enough to subsume the event time being included in the topic time (e ⊆ t) and the event time including the topic time (t ⊆ e) as special cases. In this way, it is warranted that the theory allows for interpretations ranging from progressive readings ($t \subset e$) to general-factual readings ($e \subset t$). More on that below.

As far as aspectual coding is concerned, Grønn (2004) takes on the following stand. At the level of VP, which in this conception includes internal as well as external nominal arguments, the (projection of the) simplex verb *čitat'* is still void of aspectual meaning (13a). It may get "aspectualised" by the zero operator "Ipf$_\emptyset$" (Grønn 2004: 53), consider (13b). Alternatively, it may undergo prefixation by the perfective operator *pro-*, as shown in (13c). Secondary imperfective *-yva* is treated as an operator that takes a set of times, declares a topic time as existing and requires it to overlap a new (topic) time. This way it produces a new property of (topic) times (13d). The input set of times may be provided by (13c), for instance. This will result in (13e) as the meaning of *pročityvat'*.

(13) a. $[\![\text{čitat'}]\!] = \lambda e[\,|read(e)]$
b. $\text{Ipf}_\emptyset([\![\text{čitat'}]\!]) = \lambda t[e|read(e), e \circ t]$
c. $[\![\text{pro-}]\!]([\![\text{čitat'}]\!]) = \lambda t[e|read(e), e \subseteq t]$
d. $[\![\text{-yva}]\!] = \lambda Q \lambda t_1[t_2|Q(t_2), t_1 \circ t_2]$
e. $[\![\text{pročityvat'}]\!] = \lambda t_1[t_2, e|read(e), e \subseteq t_2, t_1 \circ t_2]$

Taken together this means that, in Grønn's system, semantic perfectivity ($e \subseteq t$) is carried by overt morphemes (verbal prefixes), while semantic imperfectivity ($e \circ t$) is signaled by a zero morpheme or, in the case of secondary imperfectives, by an overt morpheme (*-yva*), which in effect returns $e \subseteq t$ to $e \circ t$.[11]

Grønn's (2004) main goal is to develop an analysis that is capable of dealing with general-factual imperfectives. (14) is the prime example to illustrate what general-factuals are (e.g. Forsyth 1970, Comrie 1976, Klein 1995). While the perfective (14a) will obligatorily refer to a completed event of reading "War and Peace", the imperfective (14b) may, depending on context, be read as referring to an ongoing event (i) or as likewise reporting on a completed reading of "War

[11] To complete the picture of Russian aspectual morphology, only two additional assumptions need to be made: (i) Certain prefixes, such as *vy-* in *vygljadet'* or *za-* in *zaviset'*, do not participate in the aspectual coding system; (ii) Certain roots, such as *bros-* or *reš-* have the perfective operator built into their lexical meaning. These additions can clearly not be counted as a drawback because every theory of aspectual coding in Russian has to live with these two limited sets of exceptions (cf. Zaliznjak & Šmelev 1997).

and Peace" (ii). The latter reading is a general-factual.[12]

(14) a. *Ja pročital Vojnu i mir.*
I read.PST.PFV war and peace
'I read "War and Peace" through.'

b. *Ja čital Vojnu i mir.*
I read.PST.IPFV war and peace
(i) 'I was reading "War and Peace".'
(ii) 'I read "War and Peace".'

Given the way perfective and imperfective operators are set up above in (12), the VP headed by the perfective verb in (14a) will give rise to the AspP in (15a), whereas the VP headed by the imperfective verb in (14b) will result in (15b).

(15) a. $AspP \Longrightarrow \lambda t[e|\text{speaker's reading of War and Peace}(e), e \subseteq t]$
b. $AspP \Longrightarrow \lambda t[e|\text{speaker's reading of War and Peace}(e), e \circ t]$

If reference to an ongoing (incomplete at topic time) event is intended, the imperfective will be the only choice because ongoingness is incompatible with the "perfective condition" $e \subseteq t$, but compatible with the the "imperfective condition" $e \circ t$. When reference to a completed event is intended, however, both aspects compete for being used, because completedness is semantically reconcilable with both $e \subseteq t$ and $e \circ t$. Here the question arises as to which form speakers should choose in the particular case.

According to Grønn (2004), the possibility of factual imperfectives arises from a division of labour between the two aspectual categories, whereby "Pf is drawn towards the culmination of the event" (Grønn 2004: 61).[13] But just why is perfective aspect drawn toward the culmination? Grønn offers a partial answer that captures "some core cases of aspectual competition" (Grønn 2004: 234). These core cases are those where the VP supplies a target state in the sense of Parsons (1990) and Kratzer (2000). The idea is that in these particular cases the semantics of the perfective strengthens to a more specific meaning: "Perfective morphology instructs us to invoke the inclusion relation $e \subseteq t$, while the presence of a well-defined target state actualises an additional condition: $f_{end}(t) \subseteq f_{target}(e)$"

[12] (14b) still allows for other readings, which I ignore here. The completed event interpretation will actualise if sentence stress falls on the verb, for instance.

[13] The reader should note that Grønn's (2004) approach is actually much more complex than I can do justice to in this paper. For instance, I ignore the important case of presuppositional imperfectives and the way the author accounts for them.

(Grønn 2004: 234). Thus, the perfective operator (12a) is flanked by the one in (16):

(16) $PF \Longrightarrow \lambda P \lambda t[e|P(e), f_{\text{end}}(t) \subseteq f_{\text{target}}(e)/\text{if defined}]$

Accordingly, if the VP-property provides a well-defined target state ("if defined"), the topic time will have to end when the target state is in force. This aspectual configuration is called "target state validity".

Associating the condition of target state validity with perfective aspect formalises the traditional view of perfectivity as resultativity, making a number of correct predictions. For instance, the proposal explains bidirectional imperfectives (also called "annulment of result" in the literature): the non-use of perfective aspect signals that target state validity is not what the speaker wants to convey, triggering the implicature on the side of the hearer that the topic time extends beyond the end of the target state; the topic time ends at some point of time when the target state is no longer in force. A prerequisite for this implicature to arise is that the target state as described by the predicate is reversible. Consider (17). This dialogue comes from a web forum where foreign language learners ask questions to native speakers. Here, a Japanese Russian learner (A) asks and a speaker of Russian (B) answers her question.

(17) A: *"Ne otkryvaj okno. Ja uže otkryvala ego 5 minut*
not open.IMP.IPFV window I already open.PST.IPFV it 5 minutes
nazad." Počemu "otkryvala" a ne "otkryla"??
before why open.PST.IPFV but not open.PST.PFV
'*Ne otkryvaj okno. Ja uže otkryvala ego 5 minut nazad* (= Don't open the window. I already opened it five minutes ago) – why *otkryvala* and not *otkryla*??'

B: *Otkryla – okno vse ešče otkryto. Otkryvala – okno bylo*
open.PST.PFV window all still open open.PST.IPFV window was
otkryto kakoe-to vremja, no uže zakryto.
open some time but already closed
'Otkryla – the window is still open. Otryvala – the window was open for some time but is already closed again' ru.hinative.com

Sometimes, the imperfective can even be found in examples where the target state *is* in force at evaluation time. Such cases are covered by Grønn's (2004) explanation, because here too, the particular conditions of the target state, although valid, are irrelevant to the speaker's communicative goal. The following example

is illustrative. What the speaker is primarily interested in communicating is not that the pancake is flipped to the other side (which it is, the result has not been annuled), but rather that the addressee does not need to spring into action (see Mueller-Reichau 2018: 289 for some discussion):

(18) *Ne nado, ja uže perevoračival blin.*
not necessary I already turn.PST.IPFV pancake
'No need. I already turned the pancake.' constructed

What the theory cannot explain is the use of general-factual imperfectives outside of the "core cases", that is to say, when the event denoted by the VP involves no target state in the sense of Kratzer and Parsons. A case in point is (14b), because the state of having read a book does not count as a target state in this strict sense (cf. Grønn 2004: 232).[14] Since the VP-predicate does not have a target state, the alternative meanings that the two aspectual operators make available are those stated in (12). Now, given these two options, Grician reasoning suggests that the semantically more specific perfective operator is to be preferred over the imperfective one. This pragmatic tie-breaker is sometimes called "semantic blocking" (Kiparsky 2005, Deo 2012). Here is how it is stated in Dowty (1980: 32):

(19) **Semantic blocking**: If a language has two (equally simple) types of syntactic structures A and B, such that A is ambiguous between meanings X and Y while B has only meaning X, speakers should reserve structure A for communicating meaning Y (since B would have been available for communicating X unambiguously and would have been chosen if X is what was intended).

Imagine Ivan wanted to tell Mary that he is one who read Tolstoy's "War and Peace". His language, Russian, makes available the two alternative syntactic structures in (15). According to (19), (15a) should win over (15b). We would expect Ivan to pronounce (14a). In fact, however, Ivan will utter (14b). Thus, the classic example is left unexplained.

It should be noted that this critical remark relates only to Grønn (2004). In a series of subsequent papers, the author developed a pragmatic account to fill

[14] A reviewer doubts that the predicate *read "War and Peace"* does not qualify as a target state predicate in Parsons's (1990) conception. Consider the following quote, however: "If I throw a ball onto the roof, the target state of this event is the ball's being on the roof, a state that may or may not last for a long time. What I am calling the Resultant-state is different; [...] it is a state that cannot cease holding at some later time" (Parsons 1990: 235). The state of me having read "War and Peace" is not a "state that may or may not last for a long time", but one that will necessarily hold forever after.

exactly this gap. For reasons of space, I cannot discuss this add-on analysis, but simply refer the reader to Grønn (2006; 2008a,b).

2.3 Filip (2000; 2008; 2017)

According to Filip (2008), for a verb to be perfective means that it involves in its semantics a covert operator called MAX_E. The effect of MAX_E is to narrow down the set of events in the denotation of the verbal predicate to a subset of it, i.e. to the set of maximal events in the predicate's denotation. The maximalization operator has first been introduced in Filip & Rothstein (2006), with central assumptions foreshadowed by Filip (2000).[15]

Technically, MAX_E "is a monadic operator, such that $\text{MAX}_E(\sum) \subset \sum$, which maps sets of partially ordered events $\sum$ onto sets of maximal events" (Filip 2008: 219). The events in the input set of MAX_E have to be partially ordered, because were it otherwise, i.e. within a set of unordered events, no maximal events could be determined.

To model the partial ordering of the events, Filip exploits the stage-of relation between events proposed in Landman (1992). The basic idea is that events may be ordered with respect to whether they constitute developmental stages of each other. All those events that are stages of each other will automatically form a partial order.

The formal definition of the stage-of relation is as follows (after Filip & Rothstein 2006):

(20) If e_1 and e_2 are events and e_1 is a stage of e_2 ($e_1 \preccurlyeq e_2$) then:
i. 'Part-of': $e_1 \leq e_2$, e_1 is part of e_2 (and hence $\tau(e_1) \subseteq \tau(e_2)$).
ii. Cross-temporal identity: e_1 and e_2 share the same essence: they count intuitively as the same event or process at different times.
iii. Kinesis: e_1 and e_2 are qualitatively distinguishable, e_1 is an earlier version of e_2, e_1 grows into e_2.

[15] Filip (2017: 182) claims "to individuate what is intuitively 'a single event seen as an unanalysed whole' (Comrie 1976, Dahl 1985) relative to a predicate P and a particular context". Indeed, given that "MAX_E singles out the largest unique event stage in a poset of eventuality stages in the denotation of P" (Filip 2017: 182), the asserted P-event cannot be but "whole" because only largest event stages are fed to the existential quantifier, which in Filip's system is introduced by tense operators applying later on, i.e. after the aspectual operator. Moreover, the asserted event will be "unanalyzed" in the sense that the issue of whether an existential claim is made about developmental substages of the event does not arise because non-maximal stages have been filtered out beforehand.

As can be seen, for the stage-of relation to hold among events, there has to be a criterion for "sameness at different times"; there has to be something that supplies a common identity to let one event be an "earlier version" of another. This something is a scale, relative to which the events are measured.[16]

The scale on which events are ordered as stages of each other has to have an upper bound – otherwise the operator MAX_E would lack the criterion of what event stage to count as maximal. Which bounded scale is relevant for interpretation in a particular case is the result of the interplay of lexical semantics, semantic composition and context, with verbal prefixes playing a central role. In the following brief recapitulation of what is outlined in that respect in Filip (2008), I will focus exclusively on Russian data.

Simplex perfective verbs like Russian *dat'* ('give'), *kupit'* ('buy') or *skazat'* ('say') have MAX_E built in their semantic representation. This implies that these verbs lexically provide some criterion of what counts as a maximal giving, buying or saying event. Simple perfectives, in other words, supply an upper-bounded scale by themselves. The provided criterion ("maximality condition") is not absolute, however, because which point on the scale serves the upper bound in a given case may still be subject to some variation. Since they provide a maximality condition, the lexical meanings of these verbs are possible inputs for MAX_E, which applies to turn the maximality condition into a maximality requirement.

Simple imperfective verbs like *pisat'* or *govorit'*, by contrast, provide no maximality condition. As a consequence, their lexical meanings do not lend themselves as inputs to MAX_E. To adopt to the input requirements of MAX_E, these verbs typically undergo prefixation:

> When applied to verb predicates at a lexical ('pre-functional') level, prefixes add meaning components that contribute to specifying a criterion for ordering of events in their denotation. In this way, prefixes contribute to licensing the application of MAX_E (Filip 2008: 244).

Thus, prefixes do not mark perfectivity, but prepare verbal meanings for the possibility of being perfective.

Pay attention to that there is no imperfective operator in Filip's system, which is made explicit in the following quote:[17]

[16] This aspect of Filip's theory, scalarity, has been elaborated on in Kagan (2012; 2015).

[17] The author seems to have changed her mind on that issue, as in Filip (2000), the perfective operator $\lambda P \lambda e[P(e) \wedge TOT(P)]$ still has an imperfective counterpart (TOT is the precursor of MAX_E) in $\lambda P \lambda e[P(e) \wedge PART(P)]$. Also in Braginsky & Rothstein (2005: 12) we read that "following Filip (2000) and Filip & Rothstein (2006), the perfective/imperfective distinction is a

> [W]e assume that only the perfective verb has MAX_E in its logical representation, while the imperfective verb […] lacks it. Implicit in this proposal is the traditional Jakobsonian view on which perfectivity is the marked category in the privative aspectual opposition, and imperfective unmarked. (Filip 2008: 247)

Recall that MAX_E is conceived of as an operator that maps sets of (partially ordered) events onto sets of (maximal) events. It follows that MAX_E does not change the semantic type of its input meaning. Accordingly, there is indeed no need to come up with an imperfective aspect operator in addition to MAX_E. Perfective verbs denote sets of maximal event stages, whereas imperfective verbs denote sets of all kinds of event stages, including maximal stages.

One prediction that follows from Filip's (2008) assumptions is that the use of a perfective will always be preferred over the use of an imperfective form if reference to a maximal event is intended by the speaker. This follows from (19), which would be violated otherwise. The prediction does not seem to be borne out by the Russian data, however. Recall (18) from above. It appears difficult to argue that the speaker in (18) did not want to remind of a complete turning of the pancake, so we may safely conclude that maximality is intended. The verb, nevertheless, is imperfective. How is this possible, given that perfectives are specialised in expressing maximality? In other words, why should the form denoting maximal events be dispreferred in a context like (18)? As far as I can see, the theory of Filip (2008) leaves this question open.[18]

2.4 Altshuler (2014)

Altshuler's (2014) theory builds on Filip (2008), but unlike her (see above 2.3) Altshuler posits two covert aspectual operators for Russian.[19] Both the imperfective and the perfective operator are modelled as partitive operators denoting functions from events to event stages (Altshuler 2014: 738). What distinguishes

non-privative distinction, with both aspects introduc[ing] grammatical operators", a passage missing in Braginsky & Rothstein (2008).

[18] Note that if the semantic content of perfective aspect was resultativity, however spelled out formally, the non-use of a perfective verb in (18) would find a quite natural explanation: focus on the result would lead to a conflict because the speaker intends to focus on polarity. The point behind is that the notion of maximality does not by itself imply emphasis on the result, which is why maximality is in harmony with a context like (18).

[19] Altshuler's (2014) conclusions about Russian are part of a broader typology of aspectual operators that aims at accounting for cross-linguistic variation in what perfective and imperfective aspects may convey.

the perfective operator from the imperfective one is that the former produces forms denoting maximal stages of events described by the VP, whereas the latter produces forms that denote arbitrary stages of events described by the VP, including maximal and non-maximal stages. This matches with Zucchi's (1999) proposal for the Russian secondary imperfective suffix (see section 2.1). Limitation to maximal stages is what characterises perfective operators. Let us have a look at the details of the proposal.

Altshuler's theoretical point of departure is Landman (1992). In that work, the English progressive aspect is analyzed as imposing on sentence interpretation the requirement that the event referred to in the actual world w^* is a stage of an event having the property P (i.e. the property denoted by the VP) in some 'near enough' world w. The aspectual operator introduced by an English progressive form is given in (21a). (21b) is Altshuler's (2014) definition of what it means for an event to be a stage of another event (see also (20)):

(21) a. $Op \longrightarrow \lambda P \lambda e' \exists e \exists w [STAGE(e', e, w^*, w, P)]$

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. $g(e') \subseteq g(e)$

Altshuler (2014) argues contra Landman (1992) that the operator presented in (21) does not really correspond to the English progressive operator. The reason is condition (21b-iv). Stated as it is, this condition allows for the event stage to be maximal, i.e. match the entire event in w. As far as the English progressive is concerned, however, this requirement is clearly too liberal, because verb forms of progressive morphology never denote maximal events (see already Filip 2000: 53). The English progressive aspect is therefore more accurately captured by replacing (21b-iv) with $g(e') \subset g(e)$.

Now Altshuler goes on to propose that the aspectual operator stated in (21) actually captures the semantics of the Russian imperfective, because of the Russian imperfective's capacity to express general-factual interpretations. We already saw in (14b) that Russian imperfective verbs may be used with reference to completed/maximal events.

Which interpretation is eventually realised depends on whether the context narrows $g(e') \subseteq g(e)$ down to $g(e') \subset g(e)$, giving rise to the progressive reading,

or down to $g(e') = g(e)$, giving rise to the completive (general-factual) reading. A context for (14b) that will suggest $g(e') = g(e)$ is given in (22):

(22) *Vse sčitali ego obrazovannym čelovekom. On*
everyone take_for.PST.IPFV him educated person he
čital Vojnu i mir.
read.PST.IPFV war and peace
'Everyone took him for a knowledgeable person. He had read "War and Peace".'

The Russian perfective operator, as already said, comes with a maximal stage requirement. This means that "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^*" (Altshuler 2014: 761). This condition rules out any event in the actual world w^* that would be true of the VP-property at the same time containing the event denoted by the sentence as a less developed stage.

(23) a. $PFV \longrightarrow \lambda P \lambda e' \exists e \exists w [MAXSTAGE(e', e, w^*, w, P)]$
b. $[\![MAXSTAGE(e', e, w^*, w, P)]\!]^{M,g}=1$ iff (i)-(v) holds:
i.-iv. the same as in (21)
v. $\forall e''[(g(e') \subset e'' \wedge e'' \subseteq g(e) \longrightarrow [\![\mathrm{P}]\!]^{M,g}(e'', w^*) = 0]$

So far the gist of the theory. The problem that it faces is addressed by the author himself (Altshuler 2014: 765ff.). Recall that imperfectives are analyzed such that they may be used to refer to maximal events, whereas for perfectives the reference to maximal events is mandatory. This raises the question: Why would an imperfective sentence implicate maximalization when its perfective counterpart entails it?

To be concrete, let us look at (14) and let us assume with Altshuler that the perfective *pročital* has a more specific meaning than the imperfective *čital*. Since both meanings fit, *čital* should be subject to semantic blocking according to (19). Aware of that problem, Altshuler (2014: 767) speculates that in those contexts where the imperfective is used to denote completed (and hence maximal) events the perfective alternative might be ruled out because its meaning does *not* fit the context. He presents two cases to validate that idea. Let me discuss at least one of these.

In (24) the sentence with the relevant predicate is preceded by two sentences having perfective prediates (*povernulas', utonili*), but a chain-of-events interpreta-

tion is excluded for conceptual reasons. Altshuler (2014) proposes that the perfective *pročitali* is inappropriate in this case because "it has been well documented that the perfective 'moves the narrative forward"' (Altshuler 2014: 769).

(24) *Mne prišlos', čto my v lodke, potom ona povernulas', i*
I.DAT dream.PST.PFV that we in boat then she turn_over.PST.PFV and
vse krome nas utonuli. My {čitali / ??pročitali} knigu
all except we.GEN drown.PST.PFV we read.PST.IPFV read.PST.PFV book
pro Titanik, i éto nas spaslo.
about T. and this we.GEN rescue.PST.PFV
'I dreamed that we were in a boat, then it turned over, and everyone except us drowned. We had read a book about the Titanic and this saved us.'

Fair enough, but just why does the perfective move the narrative forward? For Altshuler's explanation to work, there should be some ingredient in the perfective operator, but not in the imperfective operator, which triggers the chain-of-events interpretation. In his actual theory, however, there is no such element: the meaning of a perfective verb form differs from the meaning of an imperfective one merely in that it lacks non-maximal stages in its extension. Another open question is: Why should the perfective, conceived of as in (23), not fit the context in (22), where there is no chain-of-events embedding?[20]

2.5 Tatevosov (2011; 2015; 2017)

In a seminal paper, Tatevosov (2017) carefully recapitulates the theory of Russian aspect that he developed in earlier papers (notably Tatevosov 2011; 2015). Central is the notion of "aspectual invariance", a term coined to refer to the fact that in Russian and other Slavic languages, the aspectual value of a sentence stands and falls with the choice of the particular verb form. Once the form of the verb is set, so is the aspectual value of the sentence. This direct match strongly suggests the conclusion that Slavic verb forms inherently bear aspectual meanings, i.e. that perfectivity is coded in the lexical entry of a Russian verb – in compliance with traditional approaches.

[20] Grønn (2015: 187) points to this gap regarding the imperfective by saying that "[the] question for Altshuler (2014) […] is how the weak partitive meaning is pragmatically strengthened to denote either a proper subpart of the event (<) or the complete event (=)". At this place, I would like to draw the reader's attention to Gyarmathy & Altshuler (2020), a paper in which the authors aims at answering precisely this question.

Tatevosov (2017) argues that the conclusion that Russian verbs bear aspect as a lexical feature is not without alternative. The phenomenon of aspectual invariance is explicable also under the assumption that the perfective operator and the imperfective operator apply higher in syntax, above the verb phrase.[21] Accordingly, the verb phrase (and, thus, the verb) are still aspectless.

Assuming this has two important consequences. First, verbal prefixes and the secondary imperfective suffix (, which are often identified as aspectual markers, see the introduction of this paper,) cannot have aspectual content, as they figure below the syntactic level where aspect enters semantic composition. Consequently, Tatevosov (2017) refers to them as "aspectual morphology" in inverted commas. Secondly, perfective and imperfective meanings must be introduced by zero exponents. The latter consequence creates a new problem: Assume a compositional semantic approach to Russian aspect, in which there are two aspectual operators, PF and IPF. Assume furthermore that both PF and IPF have zero exponence. How can one tell from a given form whether the zero operator PF or the zero operator IPF is present in semantic structure?[22]

To cope with this problem, Tatevosov (2017) proposes that (i) the perfective operator and the imperfective operator take inputs of two different semantic types, and (ii) the "aspectual morphology" of the verb determines a particular semantic type. It follows that a verb will be selected by an aspectual operator only if the input conditions of the latter agree with the semantic type of the verb. Since the perfective operator and the imperfective operator select for different semantic types, aspectual invariance is taken care of without directly attributing aspectual meanings to lexical verbs.

Now Tatevosov goes on to show that his new account of aspectual invariance is not merely an alternative to the received view, but in fact superior to it. In two papers, Tatevosov (2011) and Tatevosov (2015), the author has laid out arguments which aim at falsifying the assumption that lexical verbs in Russian carry aspectual meanings. For reasons of space I will not be able to review the presented arguments in full detail, but let me indicate at least one piece of evidence contra to the assumption that it is the Russian verb by itself which expresses perfective aspect. The reader is referred to the above mentioned papers for a more detailed exposition. Consider (25):

[21] Specifically above vP; to not overload the paper with technicalities, I abstract away from the distinction between vP and VP. It should be noted, though, that Tatevosov's actual theory is much more detailed than my brief recapitulation of it.

[22] This question is also thrown up (but left unaddressed) by Altshuler's (2014) theory.

(25) *napisanie pis'ma v moment moego prichoda*
writing letter.GEN in moment my.GEN coming.GEN
'writing a letter at the moment of my coming'

The deverbal noun *napisanie* is derived from the stem *napis(a)-* that, if combined with a verbal ending, will create a perfective verb. Nevertheless, as (25) shows, the event referred to by *napisanie* may properly include the topic time (the moment of my coming). Since this temporal configuration is usually attributed to imperfective aspect, (25) is difficult to reconcile with the idea that *napis(a)-* expresses perfective aspect.[23]

According to Tatevosov (2017), aspectual information comes into play when (by themselves aspectless) verbs serve as complements of aspectual operators. There are two aspectual operators, both having zero exponence: "The generalization that semantic aspects are structurally dissociated from 'aspectual morphology' forces us to conclude that they are phonologically silent" (Tatevosov 2017: 26). The operators are shown in (26).

(26) a. $[\![\text{IPFV}]\!] = \lambda P_{<v,t>}.\lambda t \exists e[P(e) \wedge \tau(e) \circ t]$
b. $[\![\text{PFV}]\!] = \lambda R_{<v,<v,t>>}.\lambda t \exists e \exists s[R(s)(e) \wedge \tau(e) \circ t \wedge \tau(s) \circ t]$

As can be read from this, and as noted above, the perfective operator and the imperfective operator are conceived of as being of different semantic types. More specifically, they differ with respect to their input requirements, but yield the same type of output meaning. The imperfective operator applies to a property of events, whereas the perfective operator applies to a relation between an event and a state. Both operators map their input meanings onto a property of times.

To sum up: According to Tatevosov's theory, Russian verbs are not lexically coded for aspect. By virtue of their lexical semantics verbs merely determine the meaning of the verb phrase as being either a relation between events and states, or a property of events.[24] It is this difference in event structural meaning that the two aspectual operators, which enter at the syntactic level of AspP, are sensitive to.

Most Russian simplex verbs (*pisat', čitat', idti, ...*) denote properties of events. As such they sanction the application of IPFV, which yields an imperfective

[23] An anonymous reviewer finds this argument unconvincing: "Why should the aspectual meaning of deverbal nouns be the same as those of their morphologically related verbs, just because the two share the same stem?"

[24] Tatevosov calls his analysis "neo-Kleinian" because the former meanings correspond to 2-state contents in the conception of Klein (1995), the latter meanings correspond to Klein's 1-state contents.

meaning at AspP, imposing on interpretation the condition that the run time of the event has to overlap the topic time (which Tatevosov calls reference time), cf. (26a). Other simplex verbs (*brosit', dat', kupit', ...*) express 2-state contents, i.e. a relation between events and states, which is why they invite the application of PFV. The result is a perfective meaning at AspP, which requires that the reference time overlaps the run time of the event as well as the time interval at which the state is in force, cf. (26b).

Under the assumption that "all lexical prefixes are result-state inducing operators" (Tatevosov 2017: fn.21), the majority of Russian prefixed verbs (*napisat', výčitat', vyjti, ...*) will denote relations between events and states. Given this, they sanction the application of PFV, which correctly predicts that these verbs cannot but express perfective meanings.[25] The situation will change when YVA appears: secondary imperfective morphemes are considered to be "eventisers", following Paslawska & von Stechow (2003: 345). Applying to relations between events and states (2-state predicates), they existentially bind the state argument to produce a property of events (1-state predicate). This way verbs like *otkryvat', podpisyvat' etc.* are analyzed as having a semantics which is suitable only to the imperfective operator (26a).

Tatevosov's (2017) theory is certainly good news for all those who prefer a syntactic approach to Slavic aspect. It should be noted, however, that it builds on premises that not everyone might want to subscribe to (see footnote 23). Prima facie, aspectual invariance remains a strong point in favour of lexicalist approaches to Slavic aspect (see Rothstein 2020 for some recent discussion).

2.6 Bohnemeyer & Swift (2004)

Bohnemeyer & Swift (2004) develop a formal account of the cross-linguistic grammatical coding strategy for which the term "factative" has recently been coined (Shluinsky 2012; Arkadiev & Shluinsky 2015). A language has a factative system if there is a grammatically relevant two-way classification within its verbal lexicon such that elements of one class are assigned perfective aspect by default, and elements of the other class are assigned imperfective aspect by default, and any aspectual value other than those assigned by default has to be overtly marked. Russian is analyzed as a case in point where, according to Bohnemeyer & Swift (2004), the lexical partition is based on the opposition between telic and atelic predicates, whereby "telicity" is understood in the sense of Krifka (1998) as quantization. Russian verbal prefixes are treated as telicisers, and the secondary im-

[25] Recall that there are some exceptional prefixes, see footnote 11 in this regard.

perfective suffixation as overt aspectual marking (Bohnemeyer & Swift 2004: 274, more on that below).[26]

The ideal of telicity-dependent aspect coding is summarised in the following table (Bohnemeyer & Swift 2004: 266):

(27)

Viewpoint \ Predicate	Atelic	Telic
Imperfective	∅	Overtly expressed
Perfective	Overtly expressed	∅

To formalise the alignment between perfectivity and telicity on the one hand, and imperfectivity and atelicity on the other hand, Bohnemeyer & Swift (2004) propose that there is a default assignment mechanism for aspectual interpretations which is driven by the principle of *event realization*. Event realization requires that some part of the event e, e', has to temporally overlap the topic time (t_{TOP}), and that part of e must fall under the event predicate P, just like e does:

(28) **Event realization (Bohnemeyer & Swift 2004: 286)**
A predicate P is realised by event e at topic time t_{TOP} iff at least the run time of a subevent e' of e that also falls under the denotation of P is included in t_{TOP}.

In formal terms, the definition of event realization is stated as in (29).

(29) **Event realization, formally**
$\forall P, t_{\text{TOP}}, e \subseteq E.REAL_E(P, t_{\text{TOP}}, e) \leftrightarrow \exists e'.P(e') \wedge e' \leq_E e \wedge \tau(e') \leq_T t_{\text{TOP}}$

With (29) pinning down the content of event realization, the aspectual zero operator is then stated as follows:

(30) $\text{DASP} \Rightarrow \lambda P \lambda t_{\text{TOP}} \exists e.REAL_E(P, t_{\text{TOP}}, e)$

Let us now trace the working of DASP. The operator is stated such that, with telic predicates as input, it will output perfective viewpoint aspect, and with atelic predicates, it will output imperfective viewpoint aspect.

Telic predicates, to begin with, do not have the subinterval property. Therefore, to meet (29), e' must be identical to e. If e' was some proper part of e, and if the

[26] Other types of factative aspect marking are based on the oppositions process predicate vs. state-change predicate (e.g. Yukatec) and stative predicate vs. dynamic predicate (e.g. English), cf. Bohnemeyer & Swift (2004); Shluinsky (2012).

predicate P was telic, P cannot be true of e and of e'. It follows that, with a telic predicate, no part of e smaller than e itself can be included in the topic time t_{TOP}, i.e. realise P. Accordingly, telic predicates will have to express the temporal relation $\tau(e) \leq_T t_{TOP}$.

Unlike telic predicates, atelic predicates have the subinterval property. This makes a crucial difference because now the principle of event realization allows t_{TOP} to include not only the whole event e, but also a subinterval of e. Bohnemeyer & Swift (2004) argue that the first option ($e' = e$) is pragmatically blocked for atelic predicates because this interpretation is what the alternatives, telic predicates, are specialised for expressing. Above I referred to this blocking mechanism as "semantic blocking", see (19).[27]

Sentences based on zero-coded telic predicates are thus predicted to be used to express inclusion of the eventuality time in topic time, whereas sentences based on zero-coded atelic predicates are predicted to be used to express inclusion of the topic time in the time of the eventuality. This way, one default operator manages to derive the two meanings that Bohnemeyer & Swift (2004: 280) assume with many for the two viewpoint aspects:

(31) a. PFV $\Longrightarrow \lambda P \lambda t_{TOP} \exists e.P(e) \wedge \tau(e) \leq_T t_{TOP}$
b. IPFV $\Longrightarrow \lambda P \lambda t_{TOP} \exists e.P(e) \wedge t_{TOP} <_T \tau(e)$

There are several problems with this approach. One issue, which has been pointed to by a reviewer, is acknowledged by the authors themselves as a potential problem in a footnote (fn. 12): there are prefixed perfectives in Russian that have the subinterval property (see Filip 1999). Accordingly, these predicates cannot be accounted for within a theory of telicity-dependent aspectual reference. A solution might be to analyse these prefixes as overt aspectual markers, which does not seem too far-fetched (see Dickey 2011, and my own exposition below).

A second issue is that we certainly would not want the implicature to proper inclusion with atelic predicates to always be drawn in the absence of perfective marking. Otherwise we could not explain general-factual uses of imperfective verbs in Russian. But just why should this implicature not be drawn in cases of general-factuals?

[27] "[T]ruth-conditionally, the interpretation of DASP with homogeneously divisive predicates is vague regarding perfectivity. But in this case, all else being equal, a scalar implicature licensed by Grice's (1975) first maxime of Quantity (Q1, "make your contribution as informative as is required", or Levinson's (2000) equivalent 'Q-heuristic' ("What isn't said, isn't")) will assign an imperfective reading to DASP due to the absence of perfective marking" (Bohnemeyer & Swift 2004: 287-288).

Moreover, no concrete analysis is offered for the secondary imperfective suffix. The most explicit passage on this is the following:

> [V]erbs encoding telic predicates are zero-marked for perfective aspect: if they produce imperfective forms at all, they require the suffix *-iv/-yv* for this purpose. In contrast, atelic predicates without overt aspect marking are compatible with both imperfective and prefective interpretations. (Bohnemeyer & Swift 2004: 274)

The "contrast" mentioned in this quote seems to imply that that Bohnemeyer & Swift (2004) view the secondary imperfective suffix as an overt aspectual marker that directly introduces the imperfective operator (31b). If so, there will again be a problem with Russian general-factual imperfectives, as a reviewer correctly pointed out, because secondary imperfectives may well actualise general-factual readings, see (18) as an example.[28]

The fact that Bohnemeyer & Swift (2004) cannot deal with general-factuals raises the question: is it possible to fix this shortcoming at the same time keeping with the elegance of the default aspect theory? In §3 I will affirm this question, proposing that default aspect in Russian should be based not on quantization, but on state change. A default aspect approach to Russian aspect which is based on state change has been proposed before, notably by Ramchand (2008), to which I turn now.

2.7 Ramchand (2008)

Ramchand (2008: 1696) aims at "understanding exactly what it means to be 'perfective"'. Her starting point is the distinction between internal/lexical and external/superlexical verbal prefixes (Ramchand 2004, Romanova 2004, Svenonius 2004, Tatevosov 2007, Gehrke 2008). Internal prefixes apply at the lexical level, which is modelled as the syntactic phase at which an event description is built (Ramchand 2004: 1694). Their semantic impact is that they introduce a transition into the meaning of the base they attach to or, more technically, they specify a result phrase within the event structure (see Ramchand 2004; 2008 for details). External prefixes, by contrast, apply outside of the first (lexical) phase, in the Spec,Asp position. Unlike internal prefixes, "[t]hese prefixes do not seem to change the meaning of the lexical root, but add an identifiable extra bit of information relating to how the event progresses" (Ramchand 2008: 1695).

[28] Note that already Klein (1995) ignores the capacity of secondary imperfectives to express general-factuals (see Grønn 2004: 53ff. for discussion).

Perfective verbs may result from internal as well as from external prefixation. (32a) shows examples of the former type of perfectives, (32b) shows examples of the latter type (Ramchand 2008: 1692-95):

(32) a. vbit' ('knock in'), vytjanut' ('pull out'), zavernut' ('roll up'), ubrat' ('tidy away')
b. popit' ('drink a little'), zaplakat' ('burst into tears'), dočitat' ('finish reading'), nabrat' ('gather lots of something')

The difference in the word-internal make up between the forms in (32a) and those in (32b) produces syntagmatic differences. Perfectives formed by means of internal prefixation (32a) are generally compatible with inclusive temporal adverbials like *za dva časa* ('within two hours'), which indicates that the respective predicates are telic. In contrast to that, perfectives formed by external prefixes (32b) show "a much muddier picture" (Ramchand 2008: 1697) regarding compatibility with inclusive temporal adverbials. Ramchand (2008) concludes that perfectivity must not be equated with telicity (Filip 1992; 1999; Gehrke 2008; Borik 2006, among many others), and she argues that the observed differences between the two classes of perfectives follow from the different structural positions of internal and external prefixes. Since internal prefixes apply inside of the first (lexical) phase, they semantically contribute to the construction of a telic event description, whereas external prefixes, which apply outside of the first phase, "interact with an already fully constructed event description" (Ramchand 2008: 1696), which may be telic or atelic.

If perfectivity is not telicity, what is it? Ramchand (2008) reasons that the correct answer should account for that "the event-structure properties of the verb phrases created by Russian prefixation are clearly different from each other, but they nevertheless uniformly pass the diagnostics for perfectivity" (Ramchand 2008: 1698). I provided the diagnostics mentioned in this quote above in (4).

Ramchand (2008) seeks for an answer to the question of why all of the verb forms in (32) behave alike with respect to these diagnostics. She starts off from the following assumptions:

(33) a. The vP is the syntactic constituent within which an event description is formed; the vP accordingly denotes a set of events.
b. Aspectual meaning is a function that, taking vP-meanings as input, introduces a topic time (which Ramchand calls assertion time) and relates it to the event characterised by the vP.

c. This relationship between the topic time and the event is mediated via the temporal trace function (Krifka 1992; 1998), which maps an event onto its run time.

On the basis of these theoretical assumptions, which so far are fairly standard, Ramchand (2008) proposes a zero aspect operator close in spirit to the DASP-operator proposed by Bohnemeyer & Swift (2004). Like DASP, Ramchand's (2008) operator is stated such that it will, depending on input, produce perfective as well as imperfective meanings. Here it is:

(34) $[\![\text{Asp}_{\varnothing}]\!] = \lambda P \lambda t \exists e\,[P(e)\,\&\,t \in \tau(e)]$

Similarities notwithstanding, the particular working principle of (34) differs fundamentally from that of DASP, as it is based on two additional theoretical assumptions which are specific to Ramchand's analysis:

(35) a. The topic time is a moment rather than an interval (this can be seen from that the aspectual configuration in (34) is $t \in \tau(e)$ rather than $t \subseteq \tau(e)$).

b. Any valid relationship between the topic time and the event should meet the requirement that every subevent of the event must anchor to tense.

Against the background of (33) and (34), the two assumptions in (35) interact in the following way. If the vP describes a process event, i.e. if there are no subevents, any moment of the run time of the process qualifies for being the topic time moment, because for any chosen moment (35b) will be satisfied. As a consequence, with process verbs like *pisat'* or *pit'*, the topic time moment is non-unique.

Things change if the vP describes the transition of a process into a result state, as do predicates like *zapisat'* or *vypit'*. In these cases, there is only one moment that the default aspect operator (34) can pick out without violating (35b). Hence, the topic time cannot be but the single moment that is at the same time part of the process and part of the result state. It follows that, with prefixed verbs like *zapisat'* or *vypit'*, only one moment qualifies for being the topic time. The topic time will be unique.

This way Ramchand (2008) arrives at an answer to her initial question. To be perfective means to have a necessarily unique topic time moment. This, according to Ramchand (2008), is the essence of perfectivity in Russian. Such a meaning

is called *definite*. A non-unique topic time moment is called *indefinite* and viewed as the core of imperfectivity.

What remains to be done is to define the semantics of external prefixes as also involving a unique topic time moment. Here is Ramchand's (2008) proposal for ingressive *za-* and delimitative *po-*:

(36) a. $[\![\text{za-}]\!] = \lambda P \lambda t.P(t) \wedge t$ occurs at the onset of the temporal trace
b. $[\![\text{po-}]\!] = \lambda P \lambda t.P(t) \wedge t$ is a specific moment a short way in to the temporal trace

With respect to secondary imperfectives, Ramchand (2008: 1704) proposes a second operator that competes with (34) for realizing the aspectual head:

(37) $[\![\text{Asp}_{ivaj}]\!] = \lambda P \lambda t \exists e\,[P(e)\,\&\,\exists e'\,[Subevent(e', e)\,\&\,Proc(e')\,\&\,t \in \tau(e')]]$

Unlike (34), (37) is introduced by overt morphology. Since (37) has a more specific meaning than (34), it will be the preferred choice when vP delivers an event description involving subevent structure.

The specific representation (37) is problematic because it only derives the progressive reading, while secondary imperfectives in fact allow for the whole range of imperfective interpretations. This is acknowledged in a footnote, where Ramchand (2004: 1704) sketches how (37) might be elaborated on to also cover habitual and iterative readings. What remains unexplained is how (37) could serve as the basis for general-factual imperfective readings, as above in (18), for instance.

This is the more problematic in view of the fact that imperfectives lacking secondary imperfective suffixes, i.e. simple imperfectives, display the general-factual reading as well, as we saw in (14): (37) only applies to a vP that contains a result phrase (Ramchand 2008: 1704). Even if it was somehow possible to modify $[\![\text{Asp}_{ivaj}]\!]$ in such a way that it will also account for general-factuals, the solution would not carry over to (14). Being no secondary imperfective, the imperfective *čital* in (14b) should be derived via the zero operator (34). If it counted as containing a result phrase (say as a consequence of aspectual composition with the direct object *Vojnu i mir*), the predicted interpretation would be perfective/definite because the topic time moment should match the point where the process and the result state abut. If it counted as a process predicate (37) would not be applicable.

Above we saw that Ramchand (2008) conceives of the topic time (her assertion time) as a temporal instant rather than an interval. This assumption is crucial as it allows to derive definite topic times for perfective predicates, but it comes at a price. Empirically, it leads to troubles with factual imperfectives. Theoretically,

it opposes to the otherwise widely accepted departure from (Reichenbachian) reference time points in favour of reference/topic time intervals, as argued for at length in Klein (1994), see also Paslawska & von Stechow (2003: 314). This raises the question of whether it could be possible to develop a default aspect approach much in Ramchand's spirit that treats topic times as intervals. In the next section I will do precisely that.

3 Default aspect based on state change

In this section, I will outline a theory of default aspect for Russian. Overall, I will follow Bohnemeyer & Swift (2004), although with a crucial difference. As we saw in 2.6, the feature on which Bohnemeyer & Swift (2004) base their default aspectual operator is telicity, understood in terms of quantization. I reject this theoretical decision, arguing that replacing telicity by state change produces better results in explaining the distribution of forms across contexts. In this respect, I support Ramchand's (2008) approach. In another respect, however, my proposal will differ from Ramchand's. In line with the received view I take the topic time to be a temporal interval.

In section 3.1 I will first outline some background assumptions that I take for granted. These concern the notions of state change, 1-state and 2-state predicates, as well as the framework that I use. In section 3.2 I show how VP-meanings are built given these assumptions. 3.3 continues with the semantic composition above the level of VP. It is at this stage that I take secondary imperfectivization to be operative. In section 3.4 I will present my modified version of Bohnemeyer & Swift's (2004) DASP-operator. Then I will move on to demonstrate the working of DASP when it applies to 1-state predicates (section 3.5), 2-state predicates (section 3.6), and 2-state predicates involving secondary imperfective morphology (section 3.7). Having shown that DASP so far correctly distributes Russian verb forms among contexts, I will finally bring into the picture external prefixes (section 3.8). Focusing on delimitative *po-* and ingressive *za-*, I will explain how these prefixes apply after DASP to produce perfectives from atelic verb phrases. I will conclude with a summary in section 3.9.

3.1 Some preliminaries

In Klein (1995), a lexical distinction is drawn, and claimed to be aspectually relevant in Russian, between predicates describing and not describing the transition, or switch, from one state to another state. The author calls the former 2-state

predicates, and the latter 1-state predicates. The two states involved in the description of a 2-state predicate are dubbed "source state" and "target state" (see also Klein 1994).

Adjusted to the framework that I use, I take Kleinian 2-state predicates to be predicates that have two thematic eventuality arguments (more precisely below). In contrast to that, 1-state predicates have one thematic eventuality argument only. The notion of thematic argument that I use here deserves some comment.

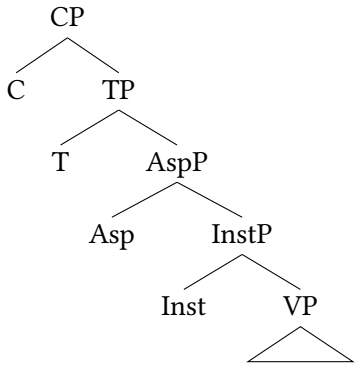
To represent the systematic composition of meaning accompanying successive increase of morphosyntactic complexity, I use DRT (Kamp & Reyle 1993, Kamp et al. 2011, Geurts et al. 2020). Specifically, I resort to the version of Farkas & de Swart (2003). These authors draw a distinction between thematic arguments and discourse referents, which is absent in the original DRT-version that was presented in Kamp & Reyle (1993). The basic idea is that predicates bring with them thematic arguments that show up in the condition set of the DRS under construction, but that do not yet have the status of discourse referents, which is why they do not appear in the DRS-universe. It is only at a higher syntactic stage that thematic arguments may be instantiated, a technical term meaning that they are substituted by discourse referents, and as such show up in the universe of the DRS. Against this theoretical background, I translate Kleinian 2-state predicates as predicates introducing two thematic eventuality arguments, and 1-state predicates as predicates introducing one thematic eventuality argument.[29]

Farkas & de Swart (2003) are concerned with nominal projections, and the syntactic level at which thematic arguments are instantiated in their system is the DP. The respective mechanism is called D-instantiation accordingly.[30] I am concerned with verbal projections, and I will refer to the respective syntactic level as InstP here. Overall, I assume the following syntactic structure to underlie semantic composition:

[29] See Tatevosov (2017) for a similar move (section 2.5).

[30] Besides that, Farkas & de Swart (2003) foresee a mechanism of A-instantiation, which is largely irrelevant to the purposes of the present paper.

(38)



The VP is the syntactic domain within which a predicate of eventualities is formed. On the semantic side, this corresponds to the representation of the predicate and its thematic argument(s) in the condition set of the DRS under construction. This holds for the minimal case, the case of an isolated intransitive verb. If the verb is accompanied by (VP-internal) arguments or adverbials, these will feed the DRS with additional conditions and, perhaps, discourse referents.

InstP is the domain within which thematic eventuality arguments are, or are not, D-instantiated in the sense of Farkas & de Swart (2003). Like determiners in the nominal projection, linguistic elements serving as Inst head may, depending on their lexical semantics, impose additional restrictions on the interpretation of the instantiated argument aka discourse referent. Below I will argue that Inst may host either a default zero head, which triggers instantiation of all of the thematic eventuality arguments of VP, or the secondary imperfective suffix, which imposes special constraints.

AspP is the domain within which a predicate of topic times is formed. The topic time relates in this or that way to the run time of the eventuality assigned to the discourse referent(s) supplied by InstP. I will show that, in order to model the distribution of Russian verbs over contexts correctly, it suffices to posit a single covert operator in Asp, similar in spirit to Bohnemeyer & Swift's (2004) DASP-operator.

3.2 Building VP-meanings

The construction of a DRS proceeds bottom-up. To start off, let us assume that the V-constituent is formed by a verb made up of the stem *pis-* (e.g. *pisal*). Processing V will lead to the construction of the DRS in (39). I assume that the verbal predicate *pis-* introduces one thematic eventuality argument and two thematic

object arguments.[31]

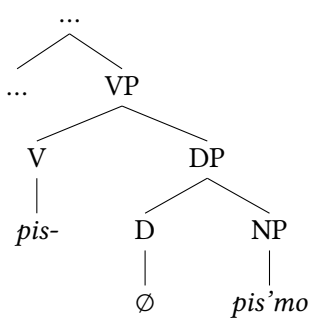
(39)

write(ẹ) author(ẹ,x̣) text(ẹ,y̰)

If there is no direct object (and if there are no adverbial modifiers) this DRS will be passed on to VP. As can be seen, at the level of VP, the arguments of the predicate do not have the status of discourse referents (the DRS-universe is empty). I use subscript dots to indicate that an argument in Con_K has not yet been addressed by Inst, assuming that every thematic argument must be addressed by Inst during the course of derivation.[32]

Now let our VP include a direct object:

(40)



Starting from the bottom again, the NP leads to the construction of the following DRS:

(41)

letter(z̰)

We move on to resolve the DP node. Russian does not have articles as D-elements. In order not to complicate the paper with discussions irrelevant to our main concern, I simply stipulate a zero determiner, as shown in (40), which D-instantiates the thematic argument of the nominal, creating the DRS in (42).

[31] The frame write.v of the English FrameNet project, with its sense being described as "compose a text in writing" contains no less than 10 frame elements. Note that the two that I take to be syntactically relevant as thematic arguments, "Text" and "Author", are by far the most frequently realised (see: framenet.icsi.berkeley.edu). Note also that I abstract away from the word sense 'doing a painting' that *pis(a)-* is likewise associated with.

[32] This mere notational convention spares using different kinds of letters for thematic arguments and discourse referents, as Farkas & de Swart (2003) do (see footnote 42).

(42)

z
letter(z)

Climbing up the tree we arrive at VP. Principles of linking theory (which I ignore here) advice us to identify the direct object argument z with the text argument y of (39), so that we get:

(43)

z
write(ẹ)
author(ẹ,x̣)
text(ẹ,z)
letter(z)

Verbs formed by the stem *pis-* are 1-state predicates. The attribute "1-state" refers to that the predicate introduces only one thematic eventuality argument, see (39) and (43). Verbs formed by stems like *bros-* ('throw') or *podpis-* ('sign') are 2-state predicates. They have a complex event structure, which manifests itself in that such predicates introduce two thematic eventuality arguments. Let a verb having the stem *podpis-* (e.g. *podpisal*) form the V-constituent. I will note the DRS resulting from processing V in the following way:[33]

(44)

sign($ẹ_1$)
signed($ẹ_2$)
cause($ẹ_1$,$ẹ_2$)
author($ẹ_1$,x̣)
text($ẹ_1$,y̰)

As is well-known, prefixed verbs like *podpisat'* are transitive, that is to say, the syntactic realization of a direct object is mandatory. Let the direct object constituent be $[_{DP}\ [_{D}\ \emptyset][_{NP}$*pis'mo*$]\ ]$, on analogy to (40). Following the same compositional steps as there, we arrive at the following DRS for the VP of a 2-state predicate:

[33] I do not believe that it is possible to state a general compositional rule that governs the derivation of prefixed stems like *podpis-*. Internal prefixation is a lexical word formation process and well-known for being largely non-compositional. But see Kagan (2015) and Biskup (2019) for interesting attempts.

(45)

z
sign(e_1)
signed(e_2)
cause(e_1,e_2)
author(e_1,x)
text(e_1,z)
letter(z)

So this is how VP-meanings are derived. What we have to bear in mind for what follows are two things: (i) there are VP-meanings that involve two eventuality arguments besides VP-meanings that involve only one eventuality argument, and (ii) eventuality arguments are not yet instantiated at this syntactic stage.

3.3 Instantiation and secondary imperfectives

The projection above VP takes care of instantiation. I conceive of InstP as the verbal counterpart of DP in the nominal domain, the level at which the thematic arguments undergo D-instantiation, which "replaces the thematic argument of the descriptive NP by the discourse referent introduced by the D" (Farkas & de Swart 2003: 35). Adjusted to the case of verbal projections, this amounts to saying that instantiation replaces the thematic argument of the descriptive VP by the discourse referent introduced by the "verbal D", which I call Inst. Farkas & de Swart (2003: 34) point out that "[d]eterminers differ from one another with respect to further restrictions they impose on the interpretation of the discourse referent they introduce". I propose that with respect to the Russian verb, there are two possible "verbal determiners", DINST and YVA.

The operator DINST is phonologically zero. It will head InstP whenever there is no overt instantiator expressed on the verb. In other words, it is a default operator. When it applies, it will instruct to substitute every thematic eventuality argument that there is by a discourse referent.

Let the VP-constituent be $[_{VP}\,[_{V}\,pis\text{-}]\,[_{DP}\,[_{D}\,\emptyset][_{NP}pi'smo]\,]\,]$. The DRS it gives rise to is given above in (43). Furthermore, let there be no phonological material in Inst, meaning that DINST serves as instantiator. Resolution of InstP will then result in the following DRS:

(46)

e z
write(e)
author(e,x)
text(e,z)
letter(z)

By the same token, if the VP is [$_{VP}$ [$_{V}$ *podpis-*] [$_{DP}$ [$_{D}$ ∅][$_{NP}$*pis'mo*]]], with the corresponding DRS being (45), the impact of DINST will lead us to construct (47).

(47)

e_1 e_2 z
sign(e_1)
signed(e_2)
cause(e_1,e_2)
author(e_1,x)
text(e_1,z)
letter(z)

Now, it is time to turn to YVA. I propose that in the grammar of Russian YVA is the alternative to the default instantiator DINST.

YVA is ambiguous in that it is associated with two construction rules:[34]

(48) Construction rules for YVA (first version)

a. Substitute the first thematic eventuality argument of the input DRS by a discourse referent.

b. Substitute the first thematic eventuality argument of the input DRS by a discourse referent, and introduce for it a condition *plural(e)* in Con_K.

This, of course, deserves some comment. To begin with, what should count as the "first" thematic eventuality argument in (48a)? Since causation implies precedence (49a), we can define firstness in a purely temporal sense as in (49b).

(49) Let e be a variable over thematic eventuality arguments.

a. $\forall i(1 \leq i < n) : cause(e_i, e_{i+1}) \longrightarrow precedes(e_i, e_{i+1})$

b. $\forall e : first(e) \longrightarrow \neg\exists e' : precedes(e', e)$

[34] By "input DRS" in (48) I mean the DRS that results from the resolution of the VP. Recall from above that substitution includes the introduction of a new discourse referent in U_K.

Note that this definition of firstness allows for the activation of (48a) in those cases where there is only one thematic eventuality argument in the input DRS (i.e. where the V-constituent is a 1-state predicate). If we wanted to exclude this possibility for empirical reasons, we would have to recalibrate this part of the theory. Such empirical reasons do in fact exist. It is known that YVA may apply to a stem like *pis-*, but if it does, the result will always be a pluractional:

(50) *Stiški ja pisyval i v junosti, no v bol'šom količestve ėtim*
poems.DIM I write.PST.IPFV also in youth but in big quantity this
delom zanjalsja uže v nynešnem tysjačeletii.
activity engage.PST.PFV already in current millenium
'I used to write little poems in my youth, but on a big scale I started engaging in this activity only in this millenium' ritminme.ru

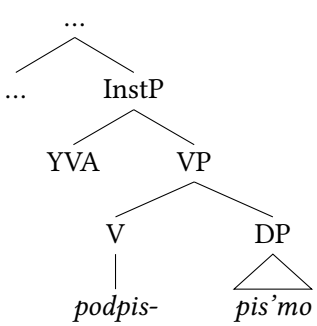
This suggests that (48a) should be no option for projections starting from 1-state predicates. In such cases we would like (48b) to be the only choice. Therefore, to make (48a) more selective, I build in a presuppositional part:

(51) Construction rules for YVA
   a. On condition that there are two thematic eventuality arguments in the input DRS: Substitute the first thematic eventuality argument by a discourse referent.
   b. Substitute the first thematic eventuality argument of the input DRS by a discourse referent, and introduce for it a condition *plural(e)* in Con_K.

Note that the presupposition that there are two thematic eventuality arguments is limited to (51a). Given the way we defined firstness above, this implies that (51a) may be activated only with 2-state predicates, whereas (51b) may be activated with 2-state predicates, but also with 1-state predicates.

Let us now see how this works, with the syntactic structure stated in (52):

(52)



To resolve InstP, we can apply the construction rule (51a). This yields the DRS in (53). Note that, although there is no discourse referent for e_2, this thematic argument has now been addressed by Inst, the only unaddressed thematic argument at this stage being x.

(53)

e_1 z
sign(e_1)
signed(e_2)
cause(e_1,e_2)
author(e_1,x)
text(e_1,z)
letter(z)

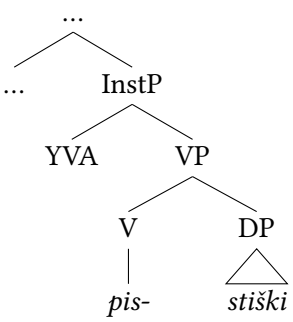
If we apply construction rule (51b) instead, we will get (54).[35]

(54)

e_1 z
sign(e_1)
signed(e_2)
cause(e_1,e_2)
author(e_1,x)
text(e_1,z)
plural(e_1)
letter(z)

Now let us change the input DRS. May the syntactic structure be like (55), as in (50).

(55)



[35] In the remainder of this paper I will not pursue construction rule (51b) any further for space reasons. In other words, I ignore habitual imperfectives.

In this case, there will be only one possibility for resolving the node InstP, because the presupposition of (51a) is not met. The DRS that we obtain by processing InstP will accordingly be (56).

(56)

e z
write(e)
author(e,x)
text(e,z)
plural(e)
little poems(z)

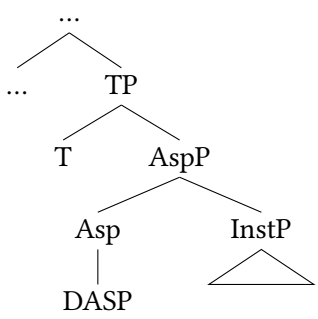
I wish to emphasise that my way of treating YVA described above is by no means new. It is, in fact, strongly inspired by Tatevosov (2017). As we saw in 2.5, Tatevosov analyses the secondary imperfective morpheme as an operator mapping 2-state predicates onto 1-state predicates, on his part referring to Paslawska & von Stechow (2003). Crucial to Tatevosov's proposal is the idea that the semantic contribution of YVA is computed *before* aspectual meanings come into play at the level of AspP, the level at which topic times are related to eventuality times. This idea of low YVA is also advocated by Ramchand & Minor (2019). Let us now turn to AspP.

3.4 The Russian default aspect operator

The core of my proposal is that Russian has only one aspectual operator at AspP which correctly assigns "perfective" meanings to forms that we know to be perfective (from well-known tests like those in (4)) and "imperfective" meanings to forms that we know to be imperfective. As noted above, important precursors are to be found in Bohnemeyer & Swift (2004) and Ramchand (2008). My approach differs from the former in that I exploit the notion of state change instead of quantization/telicity for feeding the default aspect operator, and it differs from the latter in that I make use of time intervals instead of time points for modeling the topic time.

The syntactic picture is thus as shown in (57).

(57)



To resolve AspP, we have to follow the instructions stated in the construction rule associated with DASP.[36]

(58) Construction rule for DASP
- Introduce in U_K: a new topic time discourse referent t_{TOP}
- Introduce in Con_K: $OVL(e_{fin}, t_{TOP})$
- If there is only one discourse referent e in the input DRS, then introduce in Con_K: $e = e_{fin}$
- If there are two discourse referents e_1 and e_2 in the input DRS, then introduce in Con_K: $e_2 = e_{fin}$

Let us now see what this amounts to for 1-state and 2-state predicates.

3.5 DASP applied to 1-state predicates

Assume a sentence the VP of which is headed by a 1-state predicate. Our toy example above was *pisal*. Assume furthermore that there is a direct object NP *pis'mo*, and that DINST serves as instantiator. As for InstP, this will give us the DRS (46). When resolving the AspP node, we will have to update this DRS along the lines of (58). The resulting meaning will be (59).

(59)

t_{TOP} e z
write(e)
OVL(e_{fin},t_{TOP})
e = e_{fin}
author(e,x)
text(e,z)
letter(z)

[36] "OVL" is for the temporal overlap relation.

According to the basic tenet of DRT, a sentence will be true in a model whenever there is an embedding function f that (i) assigns to each discourse referent in U_K an individual in the model, and that (ii) verifies all conditions in Con_K (e.g. Kamp & Reyle 1993, Geurts et al. 2020). (59) clearly does not represent the meaning of a sentence, but the meaning of an AspP. Note, however, that subsequent resolution of the nodes up to CP will leave the aspectual relation $OVL(e, t_{TOP})$ unchanged (it will add tense conditions, a subject discourse referent and maybe more). Therefore, we can already tell from (59) that an embedding function for the sentence (whatever the sentence may look like in the end) will have to verify the condition $OVL(e, t_{TOP})$. This condition is compatible with several scenarios of how the topic time and the eventuality overlap in the model. More precisely, it is compatible with exactly four logical possibilities. These are indicated in the figures 1 to 4 below (solid lines symbolise the run time of $f(e)$; /// stands for the interval $f(t_{TOP})$).

fig.1

fig.2

fig.3

fig.4

I will now discuss the four interpretations in figures 1 to 4 one by one, providing evidence for each option.

3.5.1 Ingressive reading (figure 1)

Figure 1 draws the transfer from a time where the eventuality assigned to e is not yet running to a time where it is running. Accordingly, if we stick to sentences with a verb having the stem *pis-*, the respective interpretation should amount to the onset of a writing.

More often than not, however, the verb *pisat'* by itself will not be found to express 'start writing'. Instead, speakers use a phase verb plus an imperfective infinitive as its complement, as in *načal pisat'*, or an ingressive prefix *za-*, as in *zakuril*:

(60) *Orlov načal pisat' pis'mo, a Grejg*
O. begin.PST.PFV write.INF.IPFV letter whereas G.

zakuril *svoju trubku …*
start_smoke.PST.PFV REFL pipe
'Orlov started writing a letter, and Grejg lighted his pipe …' NKRJa

Nevertheless, an ingressive reading for Russian 1-state verbs can be attested. In the following example it is the verb *plakat'* ('to cry') that is used in this way.[37]

(61) *Menja posetilo* *takoe oščušenie sčast'ja i* *odnovremenno*
me catch_up.PST.PFV such feeling luck and simultaneously
otčajanija, čto ja pribežal *v artističeskuju, zapersja* *i*
desperation that I run_to.PST.PFV in backstage_room lock.PST.PFV and
plakal.
cry.PST.IPFV
'I got such a feeling of luck and desperation that I ran to the backstage room, locked me up and started to cry.' NKRJa

3.5.2 Progressive reading (figure 2)

DASP applying to (the meaning of InstP projected from) a 1-state predicate also generates figure 2 as possible interpretation. This interpretation corresponds to what is usually called the progressive reading. The topic time is properly included in the time of the eventuality, giving rise to the internal viewpoint effect (cf. Smith 1991/1997). (62) shows an example:

(62) *Džen sidela* *na kuchne i* *pisala* *ėlektronnoe pis'mo, kogda*
J. sit.PST.IPFV in kitchen and write.PST.IPFV electronic letter when
Mėtt prišel *domoj s* *raboty.*
M. come.PST.PFV home from work
'Jane was sitting in the kitchen, and she was writing an email, when Matt came home from work.' e-libra.ru

In this example, the topic time is supplied by the temporal clause, corresponding to the run time of the event of Matt's coming home. This event is temporally included in the event of Jane's writing an email, thus instantiating the interpretation depicted in figure 2.

[37] Thanks to two reviewers for telling me that such examples do exist.

3.5.3 Egressive reading (figure 3)

In figure 3 we encounter another relation between the topic time and the eventuality time that (59) allows for. Here the topic time exceeds the right edge of the run time of the eventuality assigned to the discourse referent *e*. An interpretation in line with figure 3 will thus convey the message that the final stage of the eventuality has been left behind.

This case represents the mirror image of 3.5.1. And just like in that case, Russian provides special means serving the function of expressing the interpretation relevant to the issue. For one thing, Russian makes systematic use of the phase verb *končit'* 'finish' in combination with imperfective infinitives like, for instance, *pisat'*. Moreover, the completive prefix *do-* may productively be used to form perfective verbs like *dopisat'* ('finish writing').

Nevertheless, 1-state predicates may be used to convey the egressive reading in the appropriate setting. Witness compatibility of the form *čital* with *do konca* ('to the end').[38]

(63) *... a potom už ne mog prervat' čtenie,*
and then already not can.PST.IPFV interrupt.INF.PFV reading
čital do konca, sdelal liš' nebol'šoj pereryv, čtoby
read.PST.IPFV until end do.PST.PFV only small pause to
podkrepit'sja rjumočkoj.
draw_strength.INF.PFV vodka_shot
'...and from then I could not stop reading, I read to the end, made only a small pause to regain energy by having a vodka.' NKRJa

3.5.4 General-factual reading (figure 4)

Last but not least, (59) allows for the interpretation in figure 4. In this case the topic time properly includes the whole time of the eventuality. Recall that we deal only with 1-state predicates in this section, so the eventuality has to be either a state or a process. Figure 4 implies two changes, the first leading from the non-existence of the eventuality to its existence, the second from its existence to its non-existence.

The interpretation in figure 4 is well-attested. It is referred to as the "general-factual" meaning in the traditional aspectological literature. (64) shows an exam-

[38] I thank a reviewer for bringing this up to me. In the first version of this paper I held the view that the egressive interpretation of a simple imperfective would totally be blocked by the availability of the respective phase verb construction.

ple discussed in Paslawska & von Stechow (2003: 343) (see Zaliznjak & Šmelev 1997: 25 for more examples):[39]

(64) *Vse sčitali ego obrazovannym čelovekom. On*
everyone take_for.PST.IPFV him educated person he
čital Lenina.
read.PST.IPFV Lenin
'Everyone took him for a knowledgeable person. He had read Lenin.'

3.6 DASP applied to 2-state predicates

The previous section was about the spectrum of readings that DASP will give rise to when applying to the meaning of an InstP that is based on a 1-state predicate. Now I move on to investigate the range of interpretations that DASP produces when it operates over 2-state meanings.

For the purpose of illustration, I will use the same example that I used above: this section discusses the case of verbs having the stem *podpis-*, section 3.7 will be about verbs having the same stem prolonged by YVA, i.e. *podpisyv-*.

Processing InstP with $[_{VP}\ [_{V}$ *podpis-*$]\ [_{DP}\ [_{D}\ \emptyset][_{NP}$*pis'mo*$]\ ]\ ]$ as VP will result in the DRS given in (47). To compute the meaning of AspP, we have to update it in line with the construction rule for DASP, (58). The result is shown in (65).

(65)

t_{TOP} e_1 e_2 z
sign(e_1)
signed(e_2)
cause(e_1,e_2)
OVL(e_{fin},t_{TOP})
e_2 = e_{fin}
author(e_1,x)
text(e_1,z)
letter(z)

Given (65), the following figures exhaust the range of interpretations that the verb *podpisat'* may in principle give rise to. They represent all of the logically possible relations that the relation $OVL(e_2, t_{TOP})$ allows for (the vertical line symbolises the temporal point where $f(e_1)$ and $f(e_2)$ abut).

As before, I will now briefly discuss these configurations one by one.

[39] In (22) I presented a variation of it. Note that, unlike the predicate *read War and Peace*, the predicate *read Lenin* is atelic (1-state).

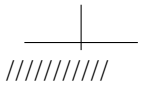
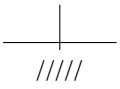


fig.5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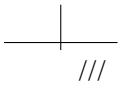
fig.7

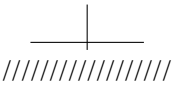
fig.8

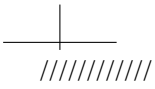
fig.9

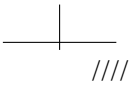
fig.10

3.6.1 Concrete-factual reading (figure 5)

Following Russian aspectological tradition, I call the first reading to be discussed "concrete factual". The content of this label is described in the Academy Grammar (Švedova et al. 1980: 604) as reference to a single situation presented as a concrete whole fact limited by a boundary ("konkretnyj celostnyj fakt, ograničennyj predelom"). This is just what is depicted in figure 5: The "whole fact" corresponds to that the eventuality assigned to e_1 is fully included in the topic time. The "limitation by a boundary" corresponds to that the topic time ends within the time of the eventuality assigned to e_2, which implies a change from $f(e_1)$ to $f(e_2)$. A classic example with three such changes forming a chain of events is given in (66).

(66) *Prišel, uvidel, pobedil.*
come.PST.PFV see.PST.PFV defeat.PST.PFV
'Veni, vidi, vici.'

3.6.2 "Culmination-in-focus" (figure 6)

The interpretation depicted in figure 6 differs from the one in figure 5 in that the start of the eventuality assigned to e_1 precedes the start of the topic time interval. Since the onset of the first eventuality lies outside of "the time interval for which an assertion is made" (Klein 1994), it will not fall within the scope of what the utterance is about. Such a reading is pragmatically licensed as an answer to an (implicit or explicit) question that queries about whether $f(e_2)$ has, or has not, been reached within t_{TOP}, presupposing that $f(e_1)$ is running. Imagine a situation where two friends together are reading a book, turning one page after the other. One is about to turn the next page. Here the following dialogue fits in (from

Plungjan 2001: 145).[40]

(67) A: *Pročital?*
read.PST.PFV
'Are you done with reading?'
B: *Da, pročital.*
yes read.PST.PFV
'Yes, I am.'

In lack of a better term, I call this reading "culmination-in-focus". It should be noted that in the Russian Academy Grammar this reading is grouped together with the one in 3.6.1 under the heading "konkretno-faktičeskij tip upotreblenija" (Švedova et al. 1980: 605). The same holds for the interpretation to be discussed in the next section, which is likewise treated as a special case of concrete-factual (cf. Švedova et al. 1980: 606).

3.6.3 Perfect reading (figure 7)

Figure 7 shows the interpretation known as perfect reading ("perfektnoe značenie"). What is characteristic of the perfect reading is that the moment of change to $f(e_2)$ lies before the begin of the topic time, and that the topic time ends when $f(e_2)$ is still in force. The respective utterance will accordingly be about the holding of the target state, i.e. of the eventuality assigned to e_2. The following example is from Švedova et al. (1980).

(68) *On postarel, raspolnel i obrjuzg.*
he grow_old.PST.PFV fatten_up.PST.PFV and bloat.PST.PFV
'He is old, fat and bloated now.'

Two things are worth noting with respect to (68). For one thing, the example shows that perfectivity does not rule out the possibility of that the topic time and

[40] An anonymous reviewer points out that the theory seems to overgenerate at this point. In a context where Peter has been reading "War and Peace" for months, and is already near the end, and the speaker thinks that Peter will finish it tomorrow, there is no culmination-in-focus interpretation available for *Petja zavtra pročitaet "Vojnu i mir"* (Peter tomorrow read-through War-and-Peace). Indeed, the correct form to convey the intended message would be *dočitaet*. Completive *do-* has a presuppositional meaning (described in Kagan 2015) which is well-suited for culmination-in-focus contexts. In such contexts, perfectives formed by means of *do-* seem to win over perfectives formed by means of "empty" prefixes (like *pro-* in *pročitat'* or *na-* in *napisat'*). Why that should be so is an intriguing topic for future research.

the utterance time overlap (contra Borik 2006). Moreover, the example also shows that perfectivity does not necessarily enforce a chain-of-events interpretation (contra (4d), see also fn. 5).

3.6.4 Pluperfect readings (figures 8, 9 and 10)

Besides the interpretations discussed so far, DASP allows for three more options, depicted in figures 8, 9 and 10. Also in these scenarios an overlap of the topic time and the run time of the eventuality assigned to e_2 is warranted. We observe systematic relationships: figure 8 differs from figure 5 in that the right edge of the topic time goes beyond the end of the run time of $f(e_2)$, and so differ figure 9 and figure 10 from figure 6 and figure 7, respectively. Below I argue that these interpretations represent pluperfect, or past perfect, readings (Borik 2006: 133).

Later on in the derivation, when the semantic contribution of T is calculated at TP, the topic time will be related to the time of the utterance. If tense is past, the topic time interval should be located before the utterance time. Since this includes also the end of the topic time, figures 8–10 leave no room for the utterance time to fall within the time of the event. This is in contrast to figures 5–7 where, under past tense, the utterance time may be located after the end of the topic time within the time of $f(e_2)$.

This dissociation of the eventuality time from the utterance time entails a transposition of the relevance center of the utterance, as the consequences of the change that the event describes, i.e. the conditions of $f(e_2)$, must now be understood as being relevant to some time prior to the utterance time. The scenarios depicted in figures 8–10 imply, in other words, a secondary evaluation time for the event in addition to the ultimate evaluation time, which is the utterance time.

Comrie (1997) points out that speakers often use the phase particle *uže* ('already') together with a perfective verb in order to express pluperfect meanings, for which there is no specialised grammatical construction in Russian (see also Paslawska & von Stechow 2003: 309). This is not by chance: the semantics of *uže* is such that it contrasts two temporal phases with each other, a phase at which the relevant property (the one delivered by the predicate with which the particle combines) is asserted to hold, and a later phase at which the same property is presupposed to hold (cf. Ippolito 2007). Applied to our case, the relevant property is the conditions of $f(e_2)$. With these conditions being presupposed (and thus expected) to hold at utterance time, it is asserted that they in fact, unexpectedly, held at some earlier time. This "earlier time" (the new evaluation time) is usually explicated in respective examples. In Paslawska & von Stechow's (2003) example (69), for instance, it is explicated by the temporal adverbial *v vosem' časov*:

(69) *V vosem' časov, Maša uže vyšla.*
in eight hours M. already go_out.PST.PFV
'At eight, Masha had already left.'

(69) illustrates the reading given in figure 8. Figure 9 shows the pluperfect version of the "culimination-in-focus" reading 3.6.2. It may arguably be exemplified by (70).

(70) *Kogda vrač prišel, ona uže rodila.*
when doctor come.PST.PFV she already give_birth.PST.PFV
'When the doctor arrived, she had already given birth.' babyblog.ru

Here, the earlier evaluation time relative to which the birth is interpreted is supplied by the subordinate clause. (71), finally, shows a pluperfect construal of the perfect reading described in 3.6.3:

(71) *V 2012 godu ja uže ustala ot tennisa i rešila zakončit'.*
in 2012 year I already get_tired.PST.PFV of tennis and decide.PST.PFV finish.INF.PFV
'In the year 2012 I was already tired of tennis and decided to finish with it.' sports.ru

By uttering (71), the speaker informs the hearer that she is tired of playing tennis and that this state held earlier than the hearer presumably expected, namely already in 2012.

3.7 DASP applied to a 2-state-predicate with the second eventuality argument uninstantiated

Recall from above (section 3.1) that I treat the secondary imperfective marker YVA as a determiner element which imposes on the two thematic eventuality arguments of a 2-state predicate the constraint that only the first of these, the source state argument, will be substituted by a discourse referent.[41]

If V is realised by some form of the verbal lexeme *podpisat'*, and if Inst is realised by YVA, the DRS which is constructed by resolving InstP (the verbal counterpart of DP in the nominal projection) will be (53). Now let DASP apply to (53)

[41] In fact, that is only one of two meanings that YVA may have, see (51). For space reasons, I cannot explore the theoretical consequences of the second, pluralizing construction rule (51b) in this paper. I will have to leave that for future research.

to form the meaning of AspP. Recall that I propose in this paper that DASP will be operative in *every* full verbal projection in Russian. The construction rule for DASP is stated in (58). It will give us (72).

(72)

t_{top} e_1 z
sign(e_1)
signed(e_2)
cause(e_1,e_2)
OVL(e_{fin},t_{top})
e_1 = e_{fin}
author(e_1,x)
text(e_1,z)
letter(z)

Given this meaning, the relation between the topic time and the run time of the eventuality assigned to e_1 may manifest itself in one of the following ways.

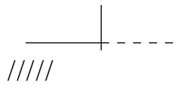

fig.11

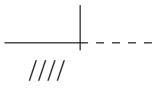

fig.12

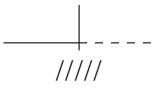

fig.13

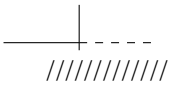

fig.14

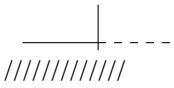

fig.15

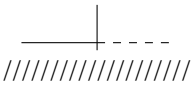

fig.16

In each of these figures the topic time /// overlaps the run time of the eventuality assigned to the final discourse referent, which, due to the impact of YVA, is now e_1. The dotted lines indicate that the respective target state argument e_2 is an implicit argument in (72).

Just what does it mean for an argument to be implicit? Farkas & de Swart (2003: 61) discuss example (73) in this regard. In that example, the implicit argument is the agent of the breaking event.

(73) *The vase was broken.*

The authors propose that implicit arguments are represented by uninstantiated thematic arguments in final DRSs. As the final DRS for (73) they, accordingly, provide (74).[42]

[42] Farkas & de Swart (2003) use different letters for thematic arguments (x, y, z, ...) and discourse

(74)

u
vase(u)
break(x,u)

The reader who is familiar with standard DRT might want to object that the DRS (74) is not proper, because it seems to involve a free discourse referent x. This problem does not arise, however, as x is not a discourse referent, but a thematic argument. Unlike discourse referents, thematic arguments are explicitly allowed to be free in final DRSs (Farkas & de Swart 2003: 60). Of course, this modification of standard DRT calls for clarification of what it means for a condition involving a thematic argument to be verified in a model. To this end, Farkas & de Swart (2003: 63) make the following proposal:

(75) Let i be a variable over the elements in $\{1, ..., n\}$. A function f verifies a condition of the form $P(a_1, ..., a_n)$ relative to a model M iff there is a sequence $\langle e_1, ..., e_n \rangle \in E^n$, such that $\langle e_1, ..., e_n \rangle \in I(P)$, and if a_i is a discourse referent, $e_i = f(a_i)$, and if a_i is a thematic argument, e_i is some element in E.

Following this example, I will assume that a DRS with an uninstantiated eventuality argument e_2 can be embedded if there is some element in E (the domain of entities in M) that corresponds to e_2. Importantly, nothing in definition (75) requires $f(e_2)$ to belong to the same world as $f(e_1)$.[43] It is certainly true that the entity corresponding to the implicit argument x in (74), the agent of the breaking event, must live in the same world as the entity assigned to the discourse referent u, the broken vase. But this, I claim, is a pragmatic effect. It results from the fact that the existence of a consequent state (the vase being broken) presupposes the existence of a causing event (the breaking involving a causer) in the same world. In the cases of interest to us, the situation is different because of the flipped temporal order of the eventualities: the existence of a causing event (the signing of a document) does not presuppose the existence of a consequent state (the document being signed). The causing event may conceivably be interrupted half-way, before it has caused the consequent state. As in (76).

referents (u, v, w, ...). To not confuse the reader with too many different kinds of letters, I decided to use the same letters for thematic arguments and discourse referents in my semantic representations. Whether or not an argument is instantiated can unequivocally be told from whether or not it appears in U_K (see footnote 32).

[43] Note a potential source of confusion: the letter "e" stands for entities in the model in (75), whereas in the main text it stands for elements in the DRS (thematic event arguments or discourse referents).

(76) *71-letnij akter v moment DTP perechodil ulicu, kogda na nego*
71-year-old actor in moment accident cross.PST.IPFV street when on him
naechal avtomobil'.
drive_at.PST.PFV car
'In the moment of the accident, the 71 year old actor was crossing the street when he was hit by a car.' dni.ru

So this is how the problem of the famous imperfective paradox (Dowty 1980; Landman 1992) is addressed in the present approach. Let us now look at the figures 11–16 one by one.

3.7.1 Ingressive reading (figure 11)

In figure 11, we revisit the ingressive reading, this time based on a 2-state predicate. Again it should be noted that this reading is preferably expressed by means of the respective phase verb construction (e.g. *načal otkryvat'*) or, however rare these cases may be, by ingressive *za-* attaching to an otherwise imperfective base, as exemplified by *zaotkryval* from Tatevosov (2015: 471).

(77) *... chrustnuli rebra, vydavilsja poslednij vozduch iz*
crack.PST.PFV ribs squeeze_out.PST.PFV final air from
legkich, i mal'čiška zaotkryval rot, kak ryba.
lungs and boy.DIM start_open.PST.PFV mouth like fish
'... ribs cracked, the last air was squeezed out of the lungs and the little boy started opening his mouth like a fish.'

Besides that, one can also find attestations of bare 2-state imperfectives which are used in contexts where it is the onset of the event described that is at issue. Consider the following. It contains an imperfective verb morphologically derived from the otherwise perfective *nasvistet'* ('whistle a piece of music'):

(78) *On umylsja, pereodelsja i nasvistyval*
he wash_oneself.PST.PFV change_clothes.PST.PFV and whistle.PST.IPFV
čto-to veseloe.
something cheerful
'He washed himself, changed clothes and started to whistle something cheerful.' NKRJa

3.7.2 Progressive reading (figure 12)

Secondary imperfectives often actualise the progressive reading, represented by figure 12. Recall from above that due to the status of e_2 as an implicit/uninstantiated argument, the verifying embedding for the final DRS built from (72) does not require the entities corresponding to e_1 and e_2 to belong to the same world.

We already saw one example of the progressive reading in (76). Here is another one.

(79) *Kogda ja podpisyval kontrakt, ja znal, čto 'Dinamo'*
when I sign.PST.IPFV contract I know.PST.IPFV that D.
nachoditsja daleko ne v lučšem položenii.
is far not in best state
'While I was signing the contract I knew that Dynamo was anything but in good condition.' vtbrussia.ru

3.7.3 An impossible reading (figure 13)

Figure 13 shows another way of how the topic time may overlap with the time of the eventuality assigned to e_1. I claim, however, that this configuration will never realise with secondary imperfectives, and here is why.

Note that in figure 13, the topic time ends within the time interval of the eventuality corresponding to e_2. This implies that the properties of the eventuality which is caused by $f(e_1)$ are of primary relevance to what the respective sentence conveys ("target state relevance", see Grønn 2004). This is arguably not reconcilable with the fact that the argument of the caused eventuality is an implicit argument. To put it in a slogan: at-issue content should not be implicitly coded. Therefore, an accommodation process is activated:

(80) **Derived instantiation**: If the topic time assigned to t_{TOP} begins or ends within some eventuality corresponding to an argument in Con_K, that eventuality requires a discourse referent in U_K. If there is none, such a discourse referent will be accommodated.

Now see what this amounts to. After accommodation of a discourse referent e_2 in (72), figure 13 should be adjusted accordingly (the dotted line should be replaced by a straight line). What we end up with, then, is the same interpretation as the one depicted in figure 6. Since figure 6 is taken care of by the same verb without secondary imperfective morphology, we arrive at a situation in which we have two candidate verbs for the same interpretation, *podpisat'* and *podpisyvat'*.

One of these is structurally more complex than the other. In such a situation the pragmatic mechanism of 'morphological blocking' (Kiparsky 2005, Deo 2012) will filter out the more complex expression.[44]

Applied to our case, the impact of morphological blocking is that it will prevent secondary imperfectives from expressing the culmination-in-focus reading (figure 6). Being equivalent to figure 6, figure 13 turns out to be no interpretive option for verbs like, for instance, *podpisyvat'*, *vybrasyvat'* or *otkryvat'*.[45]

3.7.4 Annulment-of-result reading (figure 14)

Let us consider figure 14 now. The topic time does not end within the time of the eventuality corresponding to e_2, but extends beyond its offset.[46] If tense is past, the end of the target state eventuality must be understood as being located prior to the utterance time. So far, the interpretation depicted in figure 14 matches the one in figure 9.

Also in line with figure 9 is that a sentence expressing figure 14 will not be about the whole complex event made up of one eventuality causing the other, because the initial phase of the causing eventuality lies outside of the topic time.

The difference to figure 9 consists in the absence of a discourse referent for e_2 in the DRS generating figure 14, because the argument e_2 is an uninstantiated argument in (72). In 3.7.3 I stated that implicitly coded information can only have not-at-issue status. So the question arises: Is there a way to understand a sentence that is about a caused state that is not at issue? Yes, there is. What one needs to do is drawing the implicature that the target state, which should belong to what the utterance is about, is cancelled within the limits of the topic time (cf. Grønn 2004: 236; see also section 2.2). This way, what the utterance is about is no longer the mere change from the source state to the target state, but rather the double change from the source state to the target state and again away from the target state. Of course, such an interpretation should be supported by the lexical semantics of the predicate (which should be such that the target state is cancellable under normal circumstances). I claim, in other words, that the reading

[44] This morphological blocking mechanism is often stated as an economy constraint saying that, all other things being equal less complex expressions are preferred over more complex expressions (e.g. Le Bruyne 2007).

[45] Looking at figure 13, a reviewer wonders whether my approach predicts secondary imperfectives to allow for the perfect reading. No, it does not. The perfect reading falls into the range of interpretative options for perfectives (see 3.6.3). Therefore, the use of the structurally more complex secondary imperfective in this function will also be ruled out by morphological blocking.

[46] This is why (80) does not apply.

of figure 14 is attested by the much-discussed annulment-of-result imperfectives (cf. Rassudova 1982[1968], Padučeva 1996). Recall (17) as an illustrative example.

3.7.5 Another impossible reading (figure 15)

Figure 15 shares with figure 13 the feature that the topic time ends within the interval of the caused eventuality with the argument of the caused eventuality being uninstantiated. As argued in (80), such a scenario calls for accommodation of a discourse referent e_2. Since this will in effect make figure 15 equivalent to figure 5, and since figure 5 is taken care of by a less complex verb (the same verb without secondary imperfective morphology), figure 15 turns out to be no interpretive option for a secondary imperfective, due to morphological blocking.

3.7.6 General-factual reading (figure 16)

The final reading to be discussed is shown in figure 16, which resembles figure 8 in many respects. Indeed, figure 16 and figure 8 match in every detail but the way the information about the caused event is conveyed. In both cases the topic time properly includes the intervals of the causing eventuality and the caused eventuality. The difference is that, while the argument e_2 of the DRS belonging to figure 8 is instantiated, the argument e_2 of the DRS belonging to figure 16 is uninstantiated.

Expecting that implicitly coded information provides not-at-issue content, we are entitled to draw the implicature that the specific conditions of the caused eventuality (target state) are irrelevant to the speaker's message. Since this is the core characteristics of general-factuals (Švedova et al. 1980: 611; Grønn 2004), we arrive at the interpretation that we missed in Bohnemeyer & Swift's (2004) theory, i.e. the one which is expressed by sentences such as (18).

What *is* relevant instead of the target state conditions are the consequences of a rule in the background knowledge of the interlocutors, which is pragmatically pointed at by stating that an event of the respective kind has taken place. In (18), for instance, the relevant background rule follows from that pancake recipes foresee only one flip of the pancake. Therefore, if a pancake has already been flipped, there is no need to do that again; see Mueller-Reichau (2018) for more on that.

3.8 Briefly on external prefixation

The distinction between internal and external prefixes is well-established in current research on the Slavic verb (see Section 2.7). The most detailed stocktaking of Russian prefixation has probably been carried out in Tatevosov (2013). According to that study, external prefixes subclassify into left-peripheral, selectionally restricted and positionally restricted prefixes. Here I can only scratch the surface and address selectionally restricted prefixes, in particular ingressive *za-* and delimitative *po-*.

Selectionally restricted prefixes are so-called because of their limited combinatorics, as they successfully combine with an imperfective base only. The result of their application is a perfective. Being aspect switchers, so to speak, they play a central role in the aspectual system of Russian. As pointed out by Dickey (2006), they fill a systemic gap by deriving perfectives from atelic predicates.

Following once again Ramchand (2008), I treat Russian ingressive *za-* and delimitative *po-* as operating over the meaning of AspP, see (36).

3.8.1 Ingressive *za-*

Letting ingressive *za-* apply after DASP seems nothing but consequent in view of its selectional restriction to imperfective inputs. Its meaning contribution may be stated in terms of the following construction rule:[47]

(81) Construction rule for ingressive *za-*
- Introduce in U_K: a new eventuality discourse referent e'
- Introduce in Con_K: $\supset\subset (e', e)$
- Introduce in Con_K: $OVL(t_{TOP}, e')$
- Introduce in Con_K: $\neg\, P(e')$
- Introduce in Con_K: $\neg\, OVL(t_{TOP}, t_{init}(e'))$
- Introduce in Con_K: $\neg\, OVL(t_{TOP}, t_{fin}(e))$

Take a sentence the VP of which is formed by the 1-state verb *kuril* ('he smoked'). According to what was said above, resolution of the AspP-node will give us the DRS (82).

[47] P is for the property of the morphological base to which *za-* attaches, the function $t_{init}(e)$ maps an eventuality onto its initial moment; the function $t_{fin}(e)$ maps an eventuality onto its final moment.

(82)

t_{TOP} e
smoke(e)
OVL(e,t_{TOP})
smoker(e,x)

Now let there be ingressive *za-* attached as an adjunct to AspP. On account of the construction rule in (81), the DRS resulting from processing the higher AspP *zakuril* will look as follows:

(83)

t_{TOP} e e'
smoke(e)
OVL(e,t_{TOP})
smoker(e,x)
$\supset\subset$ (e', e)
OVL(t_{TOP}, e')
¬ smoke(e')
¬ OVL(t_{TOP}, t_{init}(e'))
¬ OVL(t_{TOP}, t_{fin}(e))

This DRS will give rise to the reading depicted in figure 17. Note that, in contrast to figure 6, it is now the second eventuality alone that satisfies the property described by the VP (due to condition "¬ smoke(e')"). The respective sentence is about a change from a situation of not smoking to a situation of smoking. (60) shows such a sentence. As we saw in (77), moreover, ingressive *za-* may also be used to prefix secondary imperfectives. This will give rise to an interpretation according to figure 18.

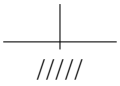

fig.17

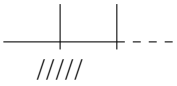

fig.18

3.8.2 Delimitative *po-*

The second selectionally restricted prefix that I want to discuss here is delimitative *po-*. (84) shows a represntative example.

(84) *A ja vyšel, pokuril i vzjal taksi.*
and 1SG go_out.PST.PFV smoke_a_bit.PST.PFV and take.PST.PFV taxi
'And I went out, smoked a bit and took a taxi.' NKRJa

To account for cases like *pokuril* in (84), I propose the following construction rule:

(85) Construction rule for delimitative *po-*
- Introduce in U_K: a new eventuality discourse referent e'
- Introduce in U_K: a new eventuality discourse referent e''
- Introduce in Con_K: $\supset\subset (e', e)$
- Introduce in Con_K: $\supset\subset (e, e'')$
- Introduce in Con_K: $OVL(t_{TOP}, e')$
- Introduce in Con_K: $OVL(t_{TOP}, e'')$
- Introduce in Con_K: $\neg\ P(e')$
- Introduce in Con_K: $\neg\ P(e'')$
- Introduce in Con_K: $\neg\ OVL(t_{TOP}, t_{init}(e'))$
- Introduce in Con_K: $\neg\ OVL(t_{TOP}, t_{fin}(e''))$

Following the same procedure as above, resolution of the first AspP-node will give us again (82). To this we let delimitative *po-* attach. The construction rule (85) will lead us to the meaning (86) for the higher AspP *pokuril*:

(86)

t_{TOP} e e' e"
smoke(e)
$OVL(e,t_{TOP})$
smoker(e,x)
$\supset\subset (e', e)$
$\supset\subset (e, e'')$
$OVL(t_{TOP}, e')$
$OVL(t_{TOP}, e'')$
$\neg$ smoke(e')
$\neg$ smoke(e'')
$\neg\ OVL(t_{TOP}, t_{init}(e'))$
$\neg\ OVL(t_{TOP}, t_{fin}(e''))$

This DRS constrains possible interpretations to readings of the kind depicted in figure 19.

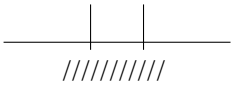

fig.19

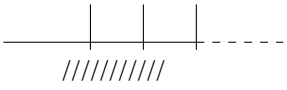

fig.20

As can be seen, we arrive at an analysis that treats *po*-delimitatives as expressing two subsequent changes, with the intermediate eventuality falling under the description of the 1-state predicate to which the prefix attaches. Such an analysis of Russian po-delimitatives as expressing "3-state-contents" is not new. It has been proposed before by Šatunovskij (2009: 313-314).

Delimitative *po-* may also apply to secondary imperfectives, on condition that the eventuality leading to the state change (i.e. $f(e_1)$) is homogeneous (see Mehlig 2006 for details). This results in the reading depicted in figure 20.

3.8.3 Loose ends

Besides positionally-restricted and left-peripheral prefixations, I also ignore other selectionally-restricted prefixes noted by Tatevosov (2013: 49), such as distributive *pere-* and cumulative *na-*. Since their semantic impact goes beyond the manipulation of temporal relations, it is difficult to state appropriate construction rules for these prefixations. So I refrain from doing that here, but I want to mention egressive *ot-*, the antipode of ingressive *za-*. Consider (87), which is among the top ten phrases of 2020 in Russia.[48] In this example, egressive *ot-* attaches to the state verb *imet'* ('have'). The resulting perfective *otymet'* describes a change from having something to not-having something.

(87) *Žizn' otymela* *smysl.*
life cease_to_have.PST.PFV sense
'Life no longer makes sense.'

The respective figure will look like figure 17 (and figure 6), but this time it is the first eventuality alone that satisfies the property of the base, P:

(88) Construction rule for egressive *ot-*
- Introduce in U_K: a new eventuality discourse referent e'
- Introduce in Con_K: $\supset\subset (e, e')$
- Introduce in Con_K: $OVL(t_{TOP}, e')$
- Introduce in Con_K: $\neg P(e')$
- Introduce in Con_K: $\neg OVL(t_{TOP}, t_{init}(e))$
- Introduce in Con_K: $\neg OVL(t_{TOP}, t_{fin}(e'))$

Let me end by pointing to a problem that my way of treating selectionally-restricted (SR) prefixes faces. It is well-known that many perfectives that are

[48] https://echo.msk.ru/blog/epsht_m/2759832-echo/

derived that way (i.e. by attachment of a SR-prefix) do not undergo secondary imperfectivization. This is, so far, in line with the theory presented above in which YVA applies before DASP and SR-prefixes apply after DASP. There are, however, also cases where SR-prefixes do allow for secondary imperfectivization (*zapevat'* ('start singing'), *zakurivat'* ('start smoking'), etc.). These pose a problem for me.[49]

3.9 Summary

Above I presented a theory that links verb forms to the range of aspectual interpretations that they can actualise in Russian texts. In that approach, a single zero operator manages to correctly distribute perfective and imperfective forms among contexts.

The focus of the analysis was on the lexical stage of Russian verb formation, the domain of lexical/internal prefixes and so-called secondary imperfective suffixes. In the end, I added some discussion of selected external prefixes. I gave a DRT-analysis in which verbal prefixes and suffixes do not by themselves express perfective or imperfective meanings (semantic aspects). Instead these affixes are used to prepare, so to speak, the input of the aspect operator. To this end, the story told is in line with conclusions drawn in works such as, inter alia, Filip (2003) or Tatevosov (2017).

The aspect operator DASP is conceived of, in the spirit of Klein (1994), as establishing a relation between topic time and eventuality time. DASP is stated such that the eventuality assigned to the final discourse referent has to overlap topic time. Crucial is the assumption that secondary imperfective YVA marks the second argument of a 2-state predicate as an implicit argument, meaning that it has no discourse referent on its own.

This gives us precisely what we observe: 2-state predicates without secondary imperfective morphology yield perfective meanings, while 1-state predicates and 2-state predicates with secondary imperfective morphology yield imperfective meanings. "Perfective meanings" are meanings where the utterance is about the conditions of the instantiated target state. In the canonical case the topic time ends when the target state is in force ("target state validity", cf. Grønn 2004). A variation on the theme are pluperfect readings, where the part of the topic time which goes beyond the end of the target state is backgrounded. "Imperfective meanings" are all those meanings that do not entail target state validity.

[49] According to Zaliznjak et al. (2015), the possibility of deriving such imperfectives increases with the frequency of the respective perfective. Given this, I am tempted to argue that in cases like *zapevat'* or *zakurivat'*, the respective prefixed verb has been lexicalised, i.e. reinterpreted by speakers as an instance of lexical prefixation. But this certainly deserves more exploration.

As for external prefixes like delimitative *po-* or ingressive *za-*, I have proposed that these come into play after DASP has applied (in line with Ramchand 2004; 2008). One might want to call this the second (syntactic) cycle of Russian verb formation. Accordingly, the semantics of these prefixes has to be stated such that they apply to already "aspectualised" meanings. These operators, in other words, take the output of DASP as input, mapping properties of times onto properties of times. Their output is a perfective meaning inasmuch as the topic time is required to end within the time of the final instantiated eventuality.

Abbreviations

Acknowledgements

I wish to thank Berit Gehrke, Radek Šimík and three anonymous reviewers for their very helpful comments. I am also grateful to the audiences at the conference Formal Approaches to Russian Linguistics 3 (Moscow State University), and at the Slavicus Expert Meeting on Aspect in Slavic (University of Wrocław) for discussion and comments. Special thanks go to: Daniel Altshuler, Hanna Bazanava, Petr Biskup, Hana Filip, Dorota Klimek-Jankowska, Serge Minor, Gillian Ramchand, Bożena Rozwadowska, Yulia Sorokina, Maria Sulimova, Sergei Tatevosov, Marcin Wągiel, Yulia Zinova.

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