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## Russian Aspect as Bidirectional Optimization \*

Notions like markedness, competition, underspecification, context sensitivity and pragmatic implicatures play an important role in traditional Slavic aspectology. I propose in this paper to give these somewhat vague theoretical constructs a more explicit status within the framework of bidirectional optimality theory (BiOT), introduced in (Blutner 1998, 2000). Blutner's BiOT can merge these elements into a coherent theory of Russian aspect with strong predictions.

In section 1, I introduce Horn's division of pragmatic labor which corresponds to the phenomenon of partial blocking in BiOT (section 2). The bidirectional perspective is related to evolution, and I therefore start the discussion of the data with the emergence of the aspectual system (section 3).

In section 4, I show how the synchronic situation favors a polarization between complete event readings of the perfective and the progressive interpretation of the imperfective. Finally, in sections 5 and 6, I turn to the problematic complete event interpretations (the factual Ipf) of the imperfective. I argue that these cases of deblocking give rise to further polarization and pragmatic strengthening. In order to account for deblocking, a context-sensitive version of BiOT is called for, and the ranking of forms and meanings must be reconsidered.

### 1. The aspect game

In Russian, for each telic VP in the lexicon the speaker is confronted with a choice between the imperfective (Ipf) and perfective (Pf) aspect. Consider for instance the aspectual competition in imperatives under negation:

- (1) *Ty, požalujsta, ne opazdyvaj.*  
you please not become\_late<sub>IMP.IPF</sub>  
“Please don't be late.” (internet)

- (2) [*Čerez 10 minut budet uže pozdno.*]  
*Smotri, ne opazdaj!*  
look<sub>IMP.IPF</sub> not become\_late<sub>IMP.PF</sub>  
“In 10 minutes it'll already be too late. Be careful not to be late.” (internet)

A negated imperative signals that the speaker wants the addressee not to perform an action *a*. Any text book of Russian grammar will inform the reader that Ipf is used in this environment – with one exception: Pf is preferred when the speaker issues a specific warning as in (2).

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Ideally, one would like to account for aspectual competition in the compositional semantics. Ipf has the meaning  $[[m]]$ , which produces the interpretation in  $[(1)]$  when combined with  $[[NEG]]$  and  $[[IMPERATIVE]]$ . Similarly, the meaning  $[[m']]$  of Pf is responsible for the interpretation in  $[(2)]$ . However, it is not clear why the semantics of Pf should rule out the interpretation “S wants H not to perform *a*”, or, similarly, why Ipf is incompatible with the interpretation “S warns H against accidentally performing *a*”. Why, then, is the latter mainly associated with Pf?

In short, truth-conditional approaches fail in such cases because they don't consider *alternative* forms which the speaker could have used. Without going into the details of negation and imperative mood, I propose that the form-meaning patterns in the examples above can be modeled as a *game*.<sup>1</sup> What is at stake for the two players S and H is the pairing of two forms – “NEG\_imperative\_Ipf” and “NEG\_imperative\_Pf” – with the two meanings “S wants H not to perform *a*” (m1) and “S warns H against accidentally performing *a*” (m2). I assume that the two forms are semantically underspecified and in principle compatible with both m1 and m2. Furthermore, I make the standard assumption that Ipf is the unmarked aspectual form in the grammar of Russian. Conceptually, the meaning m1 is less marked, more stereotypical than m2.

Economy is at the heart of rational communication. Accordingly, everything else being equal, the speaker prefers the less costly, most harmonic or most salient form, hence the ranking on forms is  $Ipf > Pf$ .<sup>2</sup> On the interpretation side, a more stereotypical situation is more economic (it minimizes the effort of the hearer) than the more unusual one, hence the ranking on meanings:  $m1 > m2$ . Given these two rankings, it is obvious that the optimal solution to our game is the pair  $\langle Ipf, m1 \rangle$ . However, as illustrated in the graphical representation below<sup>3</sup>, the tacit laws of rational communication can take us one step further:

	m1		m2
Ipf	•	←	∅
	↑		↑
Pf	∅	←	•

*Figure 1: Division of pragmatic labor  
(aspect in imperatives under negation)*

In figure 1, the speaker's preferences are represented by the vertical arrows. Irrespective of input meanings (columns) the speaker has a preference for Ipf. Similarly, the hearer's preferences correspond to the horizontal arrows. Regardless of whether H receives the input form Ipf or Pf (rows), H is drawn

<sup>1</sup> Although there are certain similarities between game-theoretical approaches to language and bidirectional optimality theory, the analogy is here primarily intended at a pretheoretical, metaphorical level.

<sup>2</sup>  $a > b$  should be read “a is better (more economic; more harmonic; more salient etc.) than b”. The ordering relation  $>$  will be constituted by two systems of ranked constraints: one for the speaker on forms and one for the hearer on meanings.

<sup>3</sup> Similar representations were introduced in (Dekker & van Rooy 2000).

towards the interpretation m1. Given this scenario, it is arguably rational for language users to opt for the following division of pragmatic labor: the (un)marked form is paired – in conformity with iconicity – with the (un)marked interpretation; a polarization known as the Horn strategy in Neo-Gricean pragmatics. Hence, there are *two* winners in our little game – the form-meaning pairs  $\langle \text{Ipf}, \text{m1} \rangle$  and  $\langle \text{Pf}, \text{m2} \rangle$ , both marked with • in figure 1.

## 2. Partial blocking in bidirectional OT

In the Neo-Gricean paradigm, the traditional markedness theory of Slavic aspectology is finally provided with some predictive power through a reanalysis of Grice’s maxim of quantity. At the same time, this kind of pragmatics makes crucial use of optimality scenarios and therefore invites a formal implementation in Optimality Theory (OT).

Recent implementations of Blutner’s bidirectional OT, more precisely the so-called weak version of BiOT, account nicely for the Horn strategy without explicit reference to the somewhat confusing interaction of the Neo-Gricean I/R and Q-principles. As shown in Jäger (2002), BiOT provides an algorithm for calculating the (weakly) optimal pairs, thus capturing the phenomenon of *partial blocking*. Informally, the reasoning goes as follows:

We start the algorithm from the speaker’s perspective. Given a situation corresponding to the meaning m1, the preferred form of S will be Ipf, hence the alternative  $\langle \text{Pf}, \text{m1} \rangle$  is *blocked*. Then we turn to the hearer. Given the input form Ipf, H will choose the interpretation m1 due to her ranking on meanings, hence the alternative  $\langle \text{Ipf}, \text{m2} \rangle$  is also blocked. Since H returns the same value as the one S started out with, the pair  $\langle \text{Ipf}, \text{m1} \rangle$  is considered optimal from both perspectives.

It is obviously rational for language users to “agree” on the form-meaning mapping  $\langle \text{Ipf}, \text{m1} \rangle$  – the most frequent meaning is encoded by the shortest, most efficient or salient form. Importantly, however, in the process of finding the optimal pair, we were able to cross out two competing candidate pairs, marked as  $\emptyset$  in figure 1 above. Then, finally, the only remaining pair  $\langle \text{Pf}, \text{m2} \rangle$ , itself not being blocked, is *weakly* optimal. In BiOT-terminology this polarization is known as partial blocking, cf. the BiOT-tableau below:

<i>Ranking:</i> Ipf > Pf; m1 > m2	m1	m2
Ipf	√ (optimal)	*(blocked)
Pf	*(blocked)	√ (weakly optimal)

*Table 1: Bidirectional optimization of aspect in imperatives under negation*

The corresponding formal definition is the following:

### **Definition 1 (Bidirectional Optimality)**

A form-meaning pair  $\langle \text{F}, \text{M} \rangle$  is weakly optimal iff

1.  $\langle F, M \rangle$  is a member of GEN, i.e. generated by the grammar.
2. there is no pair  $\langle F', M \rangle$  in GEN such that  
(2.1)  $\langle F', M \rangle \succ \langle F, M \rangle$  and (2.2)  $\langle F', M \rangle$  is weakly optimal.
3. there is no pair  $\langle F, M' \rangle$  in GEN such that  
(3.1)  $\langle F, M' \rangle \succ \langle F, M \rangle$  and (3.2)  $\langle F, M' \rangle$  is weakly optimal.

Jäger (2002) has shown that bidirectional optimality is a well-defined notion despite its apparent circularity. The recursive weak BiOT adopted here differs crucially from strong BiOT, where any grammatical pair  $\langle F', M' \rangle$  (including pairs which are blocked themselves) can block the viability of other pairs. In strong BiOT only one pair (best form matched with best meaning) can survive in a 2x2 game such as the one described above, but our weak version is more interesting and allows for the coexistence of two (weakly) optimal solutions.

To what extent is there a bidirectionally optimal solution to aspectual competition in Russian? In order to answer this question, I propose to move from the periphery of the grammar (negated imperatives) to its center (indicative assertions). But first, the BiOT reasoning invites a diachronic excursus.

### 3. Bidirectional OT and the grammaticalization of aspect

Bidirectional OT has a strong diachronic dimension. Recall from the discussion in the previous sections that we started out at stage 1 with two semantically underspecified forms, which at a later stage 2 were to become associated with more specific interpretations. Thus, from a grammar generating both synonymy and ambiguity, BiOT predicts that the speaker with her ranking on the set of forms and the hearer with her ranking on the set of meanings will coordinate on form-meaning pairs which are most preferred from both perspectives.

As such, BiOT is a powerful explanatory principle in diachronic linguistics. Furthermore, pragmatic bidirectionality creates special interpretations which can become conventionalized. Many synchronic semantic and syntactic facts can therefore be analyzed from an evolutionary perspective as “frozen pragmatics”, cf. also the concept of “fossilization” in (Blutner 2006). OT thus aims at integrating the synchronic with the diachronic view of language, notably through the hypothesis that diachronic bidirectionality evolves into synchronic unidirectionality. In this paper, before moving to the synchronic data, I propose to have a look at the emergence of the aspectual system itself, i.e. the Pf:IpF opposition which came to replace the old Indo-European aspectually loaded tenses Aorist:Imperfect.<sup>4</sup>

Russian aspect amounts to, *grosso modo*, a grammaticalization of prefixation, whereby prefixed verbs became perfective. A possible bidirectional scenario is depicted in tableau 2, where I assume the ranking on forms “(in)transitive simplex verbs  $\succ$  prefixed verbs” and the ranking on meanings “incomplete events  $\succ$  complete events”.

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<sup>4</sup> See also (Grønn 2007) for an attempt to analyze the diachronic facts from the perspective of BiOT.

<i>Ranking:</i> f1 > f2; m1 > m2	incomplete events (m1)	complete events (m2)
simplex verb (f1)	√ (optimal)	*(blocked)
prefixed verb (f2)	*(blocked)	√ (weakly optimal)

Table 2: Partial blocking prior to grammaticalization of aspect

The form f1 subsumes both intransitive and transitive VPs. Used intransitively or with a non-quantized object, a simplex verb (*čitat'* – read) will always denote an activity, which here is considered a variant of m1. At stage 1 (Old Church Slavonic/Old Russian), in a situation where telicity/perfectivity is not grammaticalized, m1 is considered the most stereotypical meaning. At stage 2, by analogy with atelic VPs, transitive and quantized versions of f1 (e.g. *čitat' knigu* – read the book) are also associated with incomplete events (e.g. progressivity). Through *associative learning* (Benz 2006), the pair <f1,m1> gets strengthened at stage 3. The incomplete event interpretation becomes the *Hauptbedeutung* (central meaning) of simplex verbs. If the speaker then, at stage 4, wants to convey the complete event interpretation, he should choose the marked form f2. At stage 5, this invites a strengthening of the pair <f2,m2>: prefixation becomes equivalent with perfectivization, giving rise to a new aspectual system.

The evolution from stage 1 to stage 5 as described here constitutes a first round optimization of Russian aspect. As a result of this process, the status of *čitat' knigu* (f1) and the prefixed *pročitat' knigu* (f2) are clearly different: f1 is still semantically underspecified but receives a preferred interpretation m1, while f2 is no longer underspecified but conventionalized/grammaticalized with the meaning m2. In a second grammaticalization round (15<sup>th</sup>-16<sup>th</sup> centuries), numerous morphological gaps in the verbal paradigms are filled by the productive morphological device known as secondary imperfectivization. This produces aspectual pairs like *otkryt' \_Pf* / *otkryvat' \_Ipf* – to open, or even “aspectual triples”: *čitat' \_Ipf* (f1) > *pročitat' \_Pf* (f2) > *pročityvat' \_Ipf* (f3). Accordingly, morphological complexity cannot any longer be the crucial factor for ranking of forms since this would not produce a linearly ordered ranking of Pf and Ipf.

#### 4. Synchronic polarization

From the point of view of bidirectional optimization, how do we make sense of the synchronic situation, exemplified below with some closely related telic event predicates?

- (3) [Dva drugikh učastnika etoj konferencii citirovali Dostoevskogo.]  
*I tak slučilos', čto kogda menja priglasili učastvovat'*  
 and so happen<sub>PAST.PF</sub> that when me<sub>ACC</sub> invite<sub>PAST.PF</sub> participate<sub>IPF</sub>  
*v konferencii, ja kak raz čital “Prestuplenie i nakazanie”.*  
 in conference I how just read<sub>PAST.IPF</sub> C&P.

“Two other participants at the conference cited Dostoevsky. And so it happened that when they invited me to participate at the conference, I was just reading “Crime and Punishment”.” (internet)

- (4) *Ja čital "Vojnu i Mir" v šestom klasse,*  
 I read<sub>PAST.IPF</sub> “War and Peace” in sixth grade  
*pročital polnost’ju za 6 dnei.*  
 read<sub>PAST.PF</sub> completely in 6 days  
 “I read “War and Peace” in 6<sup>th</sup> grade, read it through in 6 days.” (internet)

The challenge posed by these indicative past sentences becomes more transparent if we adopt a slightly more precise representation of the inventory of meanings. Aspect belongs to the temporal domain, and examples like (3) and (4) are therefore expected to receive a straightforward semantics, unlike the negated imperatives in (1)-(2), where the role of aspect was rather unclear.

I assume a standard compositional semantics, in which aspect is treated as a temporal relation between the event time and the Reichenbachian assertion time. The value of the latter is typically provided by tense and/or temporal adverbials, which take scope over aspect. In our discussion below, the interpretation of aspect will be reduced to two opposite temporal configurations: the inclusion relations  $e \subseteq t$  (the event  $e$  is temporally included in the assertion time  $t$ , i.e. a complete event interpretation) and  $t \subseteq e$  (an incomplete event interpretation). As a result of the diachronic process outlined in section 3, Pf grammatically encodes the complete event interpretation, while the meaning of Ipf remains underspecified and compatible with both these inclusion relations. For simplicity, we can think of the meaning of Ipf as the disjunction: “ $e \subseteq t$  or  $t \subseteq e$ ”.<sup>5</sup>

The speaker’s task – whether to choose Pf or Ipf – is trivial in case of a situation corresponding to  $t \subseteq e$ , as in (3), where the value of  $t$  is provided by the punctual *kogda/when* clause, but:

- (i) What is S’s best choice given the input meaning  $e \subseteq t$ ?

Similarly, the hearer’s task is trivial in case of the speaker’s preference for Pf. The more interesting issue is related to disambiguation:

- (ii) If S chooses Ipf, which interpretation should H adopt?

A standard BiOT approach to these questions starts by looking at possible rankings of the relevant forms and meanings. However, the synchronic situation is less transparent than the diachronic one (section 3) for various reasons: Pf is not underspecified synchronically, and Ipf is not necessarily a lighter expression than Pf (due to secondary imperfectivization). These facts make it non-trivial to decide

<sup>5</sup> Alternatively, one could invoke some underspecified, general concept for the imperfective such as the relation of temporal overlap (Grønn 2004), which is entailed by – and thus compatible with – both disjuncts.

on the rankings.<sup>6</sup> However, Blutner's (1998) use of the function *conditional informativity* ("surprise value") in his original version of BiOT suggests a way out.

Conditional informativity allows for a formally precise implementation of the Neo-Gricean idea that the speaker and hearer are cooperative agents, such that the best form-meaning pairs are the ones which minimize both the speaker's and hearer's effort. According to this function, the mapping  $\langle \text{Pf}, e \subseteq t \rangle$  is optimal inasmuch as the pair  $\langle \text{Pf}, t \subseteq e \rangle$  is not generated by the grammar of modern Russian and the probability of Pf denoting  $e \subseteq t$  is therefore maximal (i.e. 1). High probability in turn implies a low surprise value, which is good from the point of view of efficient communication. The probability of Ipf denoting  $e \subseteq t$  is arguably 0.5, hence the pair  $\langle \text{Ipf}, e \subseteq t \rangle$  has a higher surprise value and is therefore blocked by the rating of  $\langle \text{Pf}, e \subseteq t \rangle$ . Finally,  $\langle \text{Ipf}, t \subseteq e \rangle$  receives the same numbers as  $\langle \text{Ipf}, e \subseteq t \rangle$ , but the former survives as being bidirectionally (weakly) optimal, see (Grønn 2006) for details of this approach.

The results of applying conditional informativity comply with the intuition that Pf is in a sense logically stronger than Ipf, since the former realises its (only) meaning with higher probability than Ipf. However, this version of BiOT still predicts blocking of  $\langle \text{Ipf}, e \subseteq t \rangle$ , despite what the imperfective in example (4) tells us: "the event  $e$  of reading *War and Peace*"  $\subseteq$  "the interval  $t$  corresponding to 6<sup>th</sup> grade".

The data in (3)-(4) resembles a 2x2 game with three solutions, preserving ambiguity<sup>7</sup> – a situation which cannot be modeled in terms of bidirectional optimization (two-solutions games). BiOT predicts that the self-organization in language, aiming at successful communication, provides for an optimal solution such as Horn's equilibrium. However, the notorious *obščefaktičeskoe značenie* (the factual Ipf – Grønn 2004) in example (4) obviously blurs this picture. Do we have to give up BiOT in the synchronic analysis of Russian aspect? Such a conclusion is premature. Even in its current version, BiOT nicely accounts for the *restrictions* on the complete event interpretation of Ipf. An example is provided by comparing (5) to (5')

(5) *Kogda my poženilis',*  
 when we marry<sub>PAST.PF</sub>  
*on uže čital "Vojnu i Mir".*  
 he already read<sub>PAST.IPF</sub> "War and Peace"  
 "When we got married, he was already reading "War and Peace"."

(5') ... *on uže pročital "Vojnu i Mir".*  
 ... he already read<sub>PAST.PF</sub> "War and Peace"  
 "(when we got married), he had already read "War and Peace"."

<sup>6</sup> Another, more general, complicating factor is related to the status of synchronic explanations in BiOT.

<sup>7</sup> BiOT treats synonymy and ambiguity as equivalent phenomena, the one being the mirror image of the other. However, ambiguity seems to be much more common in natural language than true synonymy.

In actual language use we typically observe a polarization with two bidirectionally optimal winners for the past event of reading “War and Peace”: <Ipf, “the time of we’re getting married” $\subseteq e$ > in (5) and <Ppf,  $e\subseteq$  “the whole past *preceding* the time of we’re getting married”> in (5’). In the first pair – the “progressive” interpretation – the reference time of the *kogda/when* clause serves directly as the assertion time  $t$  for the aspectual relation in the main clause. The second pair corresponds to a relative past interpretation, where past tense (the  $l$ -morpheme) is interpreted as a past relative not to the utterance time, but to the reference time provided by the *kogda/when* clause (see Grønn 2004 for details on the temporal calculation of such cases).

In principle, the underspecified semantics of Ipf is compatible with both these temporal configurations<sup>8</sup>, so the question is why a relative past with a complete event interpretation of Ipf is blocked in (5) according to native speakers: \*<Ipf,  $e\subseteq$  “the whole past *preceding* the time of we’re getting married”>. In Grønn (2006), I modeled this blocking phenomenon using Blutner’s conditional informativity. This approach correctly predicts that the progressive should be considered the *Hauptbedeutung* of the imperfective. Furthermore, if the hearer’s *context* (common ground) is compatible with both a progressive/incomplete and complete event interpretation of Ipf, the progressive reading is the winner, and the apparent ambiguity disappears.<sup>9</sup>

It turns out that once we take contexts into consideration, we can still analyze the aspectual system in terms of bidirectional optimization. Below, I will focus on contexts which license the complete event interpretation of Ipf.

## 5. Context-sensitivity and deblocking: making sense of the factual Ipf

A straightforward BiOT-approach is not able to explain the factual Ipf in (4), which seems to imply a 2x2 game with genuine ambiguity. In the BiOT-literature on lexical pragmatics, such phenomena are referred to as *deblocking*.

Blutner (1998) discusses a classical example of conceptual grinding involving the standard form-meaning pairs <‘cow’, countable animal> and <‘beef’, non-countable cow-meat>. He notes that the pair <‘cow’, non-countable cow-meat> appears under special conditions, cf. table 3.

<sup>8</sup> The factual Ipf occurs in relative past configurations for instance when the verb is embedded under attitude predicates:

(i) *Ne bylo somnenij, čto ja prežde vstrečal ee*  
 not be<sub>PAST</sub> doubt, that I earlier meet<sub>PAST.IPF</sub> her  
 “There was no doubt that I had met her before.” (internet)

<sup>9</sup> “A complete event interpretation  $e\subseteq t$  is not available for the Ipf whenever a progressive/processual  $t\subseteq e$  interpretation is possible” (*Theorem 1* in Grønn 2006).

	countable animal (m1)	non-countable cow-meat (m2)
‘cow’ (f1)	√ (optimal)	*(deblocking in certain contexts: “Hindus are not allowed to eat cow.”)
‘beef’ (f2)	*(ungrammatical)	√ (weakly optimal)

Table 3: Conceptual grinding and deblocking

In a 2x2 game, where  $\langle f1, m1 \rangle$  is optimal and  $\langle f2, m2 \rangle$  is weakly optimal, deblocking of the pair  $\langle f1, m2 \rangle$  may occur in contexts where m2 does not retain its stereotypical interpretation (which is associated with f2). In the case of conceptual grinding above, the form ‘cow’ (f1) can only be mapped to the meaning ‘cow-meat’ (m2) if the latter is understood in some unusual sense.

What we want is a model which captures the fact that  $t \subseteq e$  is the *Hauptbedeutung*, while  $e \subseteq t$  is not excluded as the interpretation of Ipf. The solution is to add a contextual parameter.<sup>10</sup> Following Benz (2001) and van Rooy (2004a,b), I will derive the ordering relation between form-meaning pairs from the more “traditional” OT constraints. Importantly, a separate set of ranked constraints is relevant for ordering forms (the speaker’s task) and for ordering meanings (the hearer’s task). Furthermore, we need to distinguish between contexts for S and H: “in switching from the speaker’s to the interpreter’s role we have to be cautious about the contexts and the information the hearer has about contexts. [...] we can assume that he has always less information than the speaker, hence, more  $\langle F, M \rangle$ -pairs to consider – all pairs which are grammatical in any of his epistemically possible contexts” (Benz 2001:3).

As noted by Benz (2001), in context-sensitive BiOT it may be that H prefers, for a given form, a meaning which is compatible with the common ground but still ungrammatical in the actual context of S. I therefore need to add a global principle according to which S must avoid forms leading into such “dead ends”.

### 5.1. Constraint for the hearer: Do not accommodate!

The ranking of meanings independent of forms (and vice versa: the ranking of forms independent of meanings) is not easy to motivate. Concerning the ranking of meanings, I propose a single, general constraint for H: “Do not accommodate!”.<sup>11</sup> This simple economy principle is in line with Zeevat (2000), who argues that the original version of BiOT puts too much responsibility on H. H should merely be concerned with the task of understanding S’s utterance.

Now we can actually give an alternative or revised explanation for the blocking of  $*\langle \text{Ipf}, e \subseteq \text{“the whole past preceding the time of we’re getting married”} \rangle$  in example (5/5’) above. Production precedes interpretation, so the algorithm starts with S’s choice of Ipf in a context for S where the complete reading event precedes the marriage. H doesn’t know the true state of affairs, and

<sup>10</sup> Benz (2001) gives a rigid definition of bidirectional optimality for dynamic contexts with updates on information states. I will make use of some of his ideas below, although with less emphasis on the mathematical properties of the framework.

<sup>11</sup> This constraint is also known as “\*new” or “avoid introduction of new discourse referents”.

has to choose between the complete event interpretation and the progressive. Given the constraint “Do not accommodate!”, H prefers the progressive interpretation since a discourse referent  $t$  in the aspectual relation  $t \subseteq e$  is overtly provided by the *kogda/when* clause in S’s utterance. The alternative complete event interpretation, on the other hand, is more involved inasmuch as the value of  $t$  then has to be constructed in a non-standard way through partial accommodation. However, H’s preference for the progressive leads to a *dead end* – the configuration  $t \subseteq e$ , where  $t$  equals the time of the marriage, is not grammatical for S in a context where the reading event occurred prior to the marriage! Since S should not mislead H, she is not allowed to use IpF with the rather complex relative past interpretation in (5’).

On this view, the blocking of the complete event interpretation of IpF in (5’) is due to the fact that H, unlike S, is not in a position to exclude the progressive reading.

## 5.2. Constraint for the speaker: context-dependent salience?

Despite the phenomenon of secondary imperfectivization, is it still possible to consider IpF as the unmarked form, given the role of IpF as an aspectual default in statives, in present tense, under negation etc.? According to Blutner (p.c.), complexity of forms is not the only relevant parameter in ranking on forms. Some natural language phenomena seem to be derived from a ranking on forms related to salience and/or frequency. Let us try to model some standard cases of factual IpF assuming the ranking IpF > Pf:

- (6) A: *Krasivo ukrasili elku.* B: *Kto ukrašal?*  
 beautifully decorate<sub>PAST.PF.(PLUR)</sub> spruce who decorate<sub>PAST.IPF.</sub>  
 “A: They decorated the Christmas tree beautifully. B: Who decorated it?”

In Grønn (2004, 2006), I argued that the factual IpF in speaker B’s utterance should be analyzed as anaphoric. Speaker A asserts the existence of a complete event through a perfective verb, and speaker B refers anaphorically to this very same event by presupposing its existence and shifting focus to the agent.

Speaker B’s preference for IpF is arguably “contextually optimal” given the rankings above. Let’s check this again in a procedural way, by starting the sequential game with the best form for S in S’s context. The ranking on forms gives preference to IpF. The common ground entails a complete event due to the previous utterance by A, hence H will return the pair  $\langle \text{IpF}, e \subseteq t \rangle$ , which does not require any accommodation. Since S and H agree on this pair, it is obviously contextually optimal.

Another prototypical example of the factual IpF is the following:

- (7) *Kto čital “Vojnu i Mir”?*  
 who read<sub>PAST.IPF.</sub> “War and Peace”  
 “Who has read “War and Peace”?”

Again I make the assumption (to be revised later) that S prefers IpF as an aspectual default in this non-progressive “out of the blue” context. H then has to choose between  $e \subseteq t$  and  $t \subseteq e$  with a preference for the meaning which involves the least violations of the constraint “Do not accommodate!”. The central issue here is how H constructs a discourse referent  $t$  for the assertion time of the aspectual relation. The overt past tense morpheme in S’s utterance provides a value for  $t$ , which can roughly be paraphrased as “the whole past preceding the utterance time”. This interval is certainly too big for the configuration  $t \subseteq e$ , but just what is needed for the complete event interpretation  $e \subseteq t$ . On the other hand, the alternative progressive interpretation would violate the hearer’s constraint, since it would require accommodation of a time  $t$  referring to “some point (when?) in the past”. Hence, H prefers  $e \subseteq t$ , and the game ends with the optimal pair  $\langle \text{IpF}, e \subseteq t \rangle$ .

There are some problems with this line of reasoning. The BiOT perspective predicts that  $\langle \text{Pf}, e \subseteq t \rangle$  be blocked in (6) and (7). This prediction is clearly too strong; with a slight modification of the examples Pf is even the preferred:

- (6') ... *Kto tak velikolepno ukrasil?*  
 who so splendidly decorate<sub>PAST.PF.</sub>  
 “(They decorated the Christmas tree beautifully.) Who decorated it so splendidly?”

The same holds for (7). The use of Pf in (7') – a joke from a classroom situation – is not odd, it simply has a slightly different interpretation.

- (7') –*Kto pročitál “Vojnu i Mir”?*  
 who read<sub>PAST.PF.</sub> “War and Peace”  
 [–*A čto, ee pročitát' nado bylo? –Konečno. –Čert, a ja perepisal.*]  
 “–Who has read *War and Peace*? –What! Were we supposed to read it?  
 –Of course. –Oh shit, I rewrote it.” (internet)

In order to explain these prototypical cases of aspectual competition, I propose to take the contextual approach a step further. The idea is in a nutshell that deblocking leads to a second round of partial blocking. However, once we restrict our attention to contexts where the common ground and/or the constraint on accommodation exclude an incomplete event interpretation, Pf becomes the most salient, default aspectual choice.

## 6. From deblocking to partial blocking

The factual IpF in (6) and (7) has one characteristic in common: The speaker’s focus is not on the temporal result state of the event. On the contrary, Pf is preferred whenever the context requires marking of the result.

The nature of aspectual competition seems to fit into Relevance theoretic reasoning: “Of two utterances that take the same amount of processing, it is the

one with most contextual implications that will be the more relevant; and of two utterances which have the same number of contextual implications, it is the one which takes the least amount of processing that will be the more relevant” (Sperber and Wilson 1982, cited from van Rooy 2004a).

However, factual IpF cannot be explained away as a default aspectual usage. This is particularly clear from a comparison of the aspectual choice in (8/8’), where IpF gives rise to the rather peculiar “convention of annulled result” (*dvunapravlennoe značenie*):

(8) *Kto otkryl okno?*  
 who open<sub>PAST.PF</sub> window.  
 “Who has opened the window?” (*the window is currently open*)

(8’) *Kto otkryval okno?*  
 who open<sub>PAST.IPF</sub> window.  
 “Who had the window open?” (*the window is currently closed*)

In contexts cancelling the blocking of the factual IpF, i.e. in contexts where an incomplete event interpretation is ruled out *a priori*, Pf is clearly the most frequent and salient form. Accordingly, the speaker’s ranking on forms is Pf > IpF in these deblocking contexts. Furthermore, from the Horn strategy with its partial blocking we know that the most harmonic, salient form seeks a stereotypical interpretation. In the case of complete event interpretations, the result state following the event typically holds at the utterance time. For instance, when some agent has opened a window, we expect by default the window to be open. Hence, by associative learning (Benz 2006) it is expected that Pf acquires the implicature of *current relevance of the result state*. This explains why a resultative perfect in Germanic languages always corresponds to Pf in Russian, a language which does not have a morphologically overt perfect tense.

The following quote on blocking in BiOT captures what happens to the factual IpF in (8’) in light of the default Pf in (8): “The unemployed form may soon find a new job, generally expressing something closely related to but subtly different from the canonical interpretation that one might have expected” (Beaver & Lee, 2003: 140). The “convention of annulled result” in (8’) is an illustration of such a non-canonical complete event interpretation. At the same time, this implicature is an epiphenomenon of the lexical properties of the VP “to open the window”, which contains an inherent *target state* (Grønn 2004). Thus, if the target state is cancelled or reversed, IpF can still emerge as the winner.

The general picture, suggesting a uniform analysis of examples (6)-(8), is given in table 4. The specific polarization in (8/8’) is represented in table 5.

<i>Ranking in contexts incompatible with incomplete events: Pf &gt; Ipf; m1 &gt; m2</i>	canonical $e \subseteq t$ (+RES): m1	non-canonical $e \subseteq t$ (RES is irrelevant): m2
Pf	√ (optimal)	*(blocked)
Ipf	*(blocked)	√ (weakly optimal)

Table 4: Deblocking and partial blocking in a second round context-sensitive optimization

<i>Ranking: Pf &gt; Ipf; m1 &gt; m2</i>	$e \subseteq t$ + target state validity: m1	$e \subseteq t$ + target state cancellation: m2
Pf	√ (optimal)	*(blocked)
Ipf	*(blocked)	√ (weakly optimal)

Table 5: Deblocking and partial blocking with target state predicates

What is the status of the annulled result interpretation in (8'), i.e. the pair  $\langle \text{Ipf}, m2 \rangle$  in table 5? If bidirectional optimization is primarily a diachronic process, one might expect that the meaning  $m2$  of Ipf becomes conventionalized and thus part of the truth-conditional content. However, at least synchronically,  $m2$  is merely an unstable pragmatic implicature which is easily cancelled:

- (9) *Eto ty otkryval dver' grjaznymi rukami?*  
that you open<sub>PAST.IPF</sub> door dirty<sub>INSTR</sub> hands<sub>INSTR</sub>  
“Was it you who opened the door with dirty hands?” (internet)

In this particular context, the common ground entails the existence of a previous event of opening the door. Hence, the motivation for S's choice of Ipf is similar to example (6) above, i.e. a case of event anaphora with focus on the agent. Although the predicate “to open the door” has an inherent target state, the issue of target state validity is irrelevant in (9), and the implicature  $m2$  does not arise.

In fact, from the use of the special form Ipf in examples such as (8'), H can only conclude that something special is going on w.r.t. the event of opening the window. In most, but not all, contexts, the specific strengthening of this implicature amounts to cancellation of the target state.

## 7. Conclusion

Aspect is a linguistic phenomenon which traditionally has been analyzed within the semantic subsystem, but may, in some respects, find a better explanation in the pragmatic subsystem of BiOT. I have shown that if we adopt a *context-sensitive* version of Bidirectional OT, there is *one* solution (one equilibrium) to the aspect game, at least for the cases discussed here.

The original version of bidirectional OT was mainly concerned with lexical pragmatics (“kill” vs. “cause to die”). Blutner (1998:45f.) acknowledged the need for more realistic examples and more empirical evidence and studies. It seems to me that the study of the aspectual system in Slavic is an area where

BiOT can be a valuable tool, although it is far from evident where exactly the compositional semantics ends and the bidirectional OT-pragmatics starts.

Time is ripe to mention a few more problematic points of the approach presented here. In BiOT, “alternatives must contrast in view of an element which is qualitatively similar in a relevant sense” (Blutner 1998:26). For this reason, I have restricted the analysis to complete vs. incomplete event interpretations, abstracting away from a whole range of other usages of the imperfective in Russian, e.g. the habitual-iterative readings. Hopefully, the general findings remain valid if one tries to incorporate the analysis into the larger picture.

What is particularly attractive about Russian aspect is the clear opposition between two forms, Pf:Ipf. However, even this aspect of the analysis is an idealisation. The data discussed here suggest that the set of forms may in fact be considerably extended, taking into account the combination of each of the two aspects with various temporal adverbials, tenses, information structure etc.

This being said, the BiOT-perspective is a nice way of factoring out the particular status of implicatures arising from competition between two members of a grammatical category. At every level of optimization, we get a polarization, a pragmatic strengthening, of the interpretations accorded to the two aspectual competitors. The Horn strategy implemented in BiOT captures a pragmatic iconicity principle which allows S and H to use language efficiently: (un)marked forms are paired with (un)marked meanings. However, BiOT must be applied with caution in view of such phenomena as deblocking which may completely reverse the ranking of forms.

The role of the Horn strategy (partial blocking) in Russian aspect raises the question of diachronic vs. synchronic explanations. The two approaches may coexist in BiOT, as argued recently by Blutner (2006). A difference is worth pointing out, though: when partial blocking occurs in cases of deblocking (e.g. the annulled result reading of Ipf), the coordination game between S and H does not seem to be fully conventionalized. This is not surprising since the context sensitivity of this phenomenon suggests that the implicatures involved are part of on-line, local reasoning. On the contrary, in the diachronic case, the division of pragmatic labor ended up being partly conventionalized/grammaticalized (Ipf remains underspecified).

Finally, I would like to emphasize one consequence of the BiOT-perspective on the imperfective in Russian. A sentence is truly ambiguous only if there are at least two interpretations of it that are optimally relevant (van Rooy 2004a). The analysis presented here shows that the alleged ambiguity of Ipf is not so frequent after all. By enriching the standard BiOT-models with contexts, it can be demonstrated that games containing the underspecified Ipf typically give rise to an equilibrium: one separating Horn strategy for each context.

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