Scalar Implicatures of Russian Verbs[*]

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In this paper we address the common claim that perfective verbs presuppose the initial phase (or a process part) of events denoted by them, and assert their final phase (or a culmination part), while the meaning of imperfective verbs lacks both components. Different formulations of this claim have been proposed by Padučeva (1996, 2011) and Romanova (2006) for Russian, and by Dočekal and Kučerová (2009) for Czech, among others. We argue that what is regarded as a matter of presupposition in the semantic structure of Russian perfective verbs is best analyzed in terms of scalar implicature in the negated contexts and entailment in the affirmative sentences. The main evidence for our analysis is based on some recent work in the presupposition projection theories; of particular interest is Chemla's (2009) experimental study.

1   The Main Idea

According to the proposals by Padučeva (1996, 2011), Romanova (2006) and Dočekal and Kučerová (2009), the semantic structure of (1) consists of two components: (i) a process part of an event of reading, which is

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taken to be presupposed, followed by (ii) a culmination at a point when the whole book has been read, which is taken to be asserted.

(1) Ivan pročital   ètu knigu.
     Ivan PREF.read$_{PAST.SG.M}$ this book
     'Ivan read this book completely through.'

The presuppositional nature of the process component of perfective verbs is viewed as being confirmed by the observation that it is preserved under negation and in questions, as shown in (2a) and (2b), respectively:

(2) a. Ivan ne pročital^{PF} ètu   knigu.
        Ivan NEG PREF.read$_{PAST.SG.M}$ this book
        'Ivan did not read this book completely through.'
        Inference: Ivan started reading/read a part of this book.
        Assertion: Ivan did not finish reading this book.
    b. Ivan pročital^{PF} ètu knigu?
        Ivan PREF.read$_{PAST.SG.M}$ this book
        'Has/Did Ivan read this book completely through?'
        Inference: Ivan started reading/ read a part of this book.
        Question: The speaker asks the addressee to confirm or deny whether Ivan finished reading this book.

In (2a), what is negated is the culmination, but not the process (initial) part of described events, i.e., (2a) can be felicitously uttered in a situation in which it is known that Ivan started reading the book. In (2b), the speaker takes it for granted that Ivan started reading the book, and what is questioned is whether he finished it. To the extent that the previous studies rely on the negation and question tests, it is fair to assume that what they have in mind is a semantic presupposition.

In this paper, we argue that the existential inference in question is not a matter of semantic presupposition, contrary to most analyses, but instead, a matter of scalar implicature in negative contexts (2a) and in questions (2b), and an entailment in affirmative sentences (1). We will provide empirical tests allowing us to tease apart presuppositions, entailments and (scalar) implicatures associated with Russian perfective verbs. The tests are based on the recent research in the domain of

projective content (Chemla 2009; Romoli 2011; Schlenker 2008, among others).

The paper is organized as follows. In Section 2 we present several variants of a presuppositional analysis of the inferences associated with perfective verbs and point out their weaknesses. In Section 3 we apply standard tests for semantic and pragmatic presuppositions to Russian verbs, and introduce Grønn's (2004, 2006) idea that the inference in question is a pragmatic implicature. In Section 4 we discuss the results of the recent experiment by Chemla (2009) and the questionnaire study we have done on the basis of those results. The empirical data obtained from the questionnaire is then used to advocate the scalar implicature analysis of the inferences associated with perfective verbs.

2   Presuppositional Analyses of Slavic Perfective Verbs

2.1   Russian Linguistic Tradition

In the Russian linguistic tradition, the idea that perfective verbs have a bipartite structure can be traced back to Maslov (1984). On his view, Russian perfective verbs consist of an 'eventive' part *(sobytijnyj komponent)* and a 'stative / resultative' part *(statal'nyj komponent)*.

Building on Maslov (1984), Padučeva (1996, 2011) proposes that these two components of perfective verbs differ in their communicative status. What roughly corresponds to Maslov's 'eventive' component is presupposed and concerns backgrounded information. On her view, it comprises not only the process part of events described by perfective verbs, but also their preparatory conditions and various associated pragmatic factors like intentions, expectations and obligations associated with the utterance of sentences headed by perfective verbs. The second, asserted, component regards focused information, including the 'reaching of a/the boundary', i.e., the final phase of events involving goals, results, and limits of various sorts. Padučeva (1996) illustrates these points with the following contrast, among others:

(3) a.   Taksi vyzyvali^{IPF}?   [= (1)] Padučeva 1996]
          Taxi call$_{PAST.PL}$
          'Did you call a cab?'

b. Vy vyzvali^{PF} taksi?
  you$_{PL}$ call$_{PAST.PL}$ taxi
  'Did you call a cab?'
  Presupposition: The hearer was expected/required to call a cab.

(3a), which is headed by an imperfective verb, is a neutral question about whether a cab was called. (3b), which is headed by a perfective verb, in addition, strongly suggests that from the point of view of the speaker the addressee was required or obliged to call a cab.

What is important for the purposes of this paper is that Padučeva (1996, p. 54) also claims that "the first [i.e., presupposed, backgrounded, YZ&HF] component does not fall within the scope of negation." In evoking a standard test for a semantic presupposition, she implicitly suggests that 'the first [meaning] component' of perfective verbs is, on her view, akin to a semantic presupposition, even if she does not use this term.

Although Padučeva (1996) adduces a number of valid and subtle intuitions in support of her approach to the uses of perfective verbs, as opposed to imperfective ones, its major weakness is that it fails to separate between the semantic meaning components of perfective verbs, on the one hand, and various speech act related pragmatic inferences (such as speaker's deontic and normative expectations on the addressee) associated with utterances of sentences with perfective verbs, on the other hand.

The second problem, and one that is also mentioned in Grønn (2004), is that the observed speaker-oriented modality inferences are not consistently attached to all the uses of sentences with perfective verbs. For instance, as Grønn (2004) observes, they are not associated with the utterances of affirmative perfective sentences. Take, for example, (4), which is an affirmative correspondent of (3b), but unlike (3b) it does not suggest (under the most neutral circumstances) that the referent of *you* was required or obliged to call a cab:

(4) Vy vyzvali^{PF} taksi.
   you call$_{PAST.PL}$ taxi
   'You called a cab.'

Padučeva (1996, p. 56) also observes that there is no reason to assume that the utterance of (4) triggers the inference of an "expectation component" ("komponent ožidanija") on the part of the speaker, but she does not motivate this observation any further. That is, Padučeva (1996) is aware of the fact that not all (utterances of) sentences with perfective verbs carry the relevant inference (or "presupposition" in her wide sense), but she does not provide any account when it may, must or must not be present in sentences with perfective verbs.

2.2   Contemporary Syntactic Approaches to the Decomposition of Perfective Verbs

Following Padučeva (1996), Romanova (2006) proposes that "perfective verbs must have a complex semantic structure, where one part is asserted, the other is presupposed" (p.29). She adopts Padučeva's (1996) characterization of the presupposed part, but has a different understanding of the asserted component.

Most importantly, according to Romanova (2006), "it is not true that only resultative verbs or the verbs with 'reaching-the-boundary' component, can bear the presupposition of perfectives" (p. 29); rather, all perfectives are "words that encode decomposable structures (informational, semantic and therefore syntactic)" (ibid., p. 53). For example, even the class of inceptive verbs like those with the prefix *za-* like *zapet'* 'to begin to sing' which fail to entail culmination or result, limit of some sort (under the most usual understanding) are taken to have a complex semantic structure, whereby the first part is presupposed. (5) (example (64a) in Romanova 2006, p.29), for instance, asserts that Tonja did not start to sing and presupposes that Tonja was expected to sing her song, according to Romanova (2006).

(5)   Tonja   ne zapela^{PF} svoju   pesnju.
       T.   not INCEP.sing$_{PAST.SG.F}$ self's$_{F.ACC}$ song$_{ACC}$
       'Tonja didn't start to sing her song (contrary to the expectation).'

To give another example, (6) ((65) in Romanova 2006, p. 30) is claimed to be associated with a "presupposition" that the addressee was supposed to buy bread:

(6) Ty   kupila^PF   xleb?
     You_{SG.NOM}   bought_{PAST.SG.F}   bread_{ACC}
     'Did you buy bread?'
     Presupposition: You were supposed to buy bread.

This move then allows her to assimilate the semantics of perfective verbs as a whole class to accomplishments which are commonly assumed to have a bipartite structure. Romanova (2006) follows a syntactic approach of Ramchand (2006), according to which accomplishments are syntactic structures that consist of two separate projections, namely *process* (ProcP) and *result* (resP) corresponding to the presuppositional and assertive components of the meaning of perfective verbs, respectively.

There are three main problems with Romanova's (2006) account. First, the meaning of perfective verbs as a whole class cannot be assimilated to that of accomplishments (for counterarguments see Filip 2000, Filip and Rothstein 2005). Obviously, there are perfective verbs that cannot be meaningfully decomposed into two subevents, a process and a result subevent. One good example is the class of semelfactive verbs with the suffix *–nu-* in Russian: e.g., *prygnut'* 'to jump'.

Second, what remains entirely unclear is the representation of speaker and/or addressee oriented attitudes in terms of syntactic structures. For instance, the syntactic representation of the alleged 'contrary to the expectation' (5) and obligation (6) inference that is supposed to be associated with the *process* (ProcP) part of the syntactic structure of perfective verbs remains on a pre-theoretic level.

Third, it is easy to show that the alleged presuppositional meaning components (here, the expectation of the speaker on the addressee or on some participant of the situation described by perfective sentences) are not tied to the uses of perfective verbs only, which is a point of criticism that also applies to Padučeva's (1996) proposal. Compare (5) with (7). The main difference between them is in their main verbs: (5) is headed by a perfective verb, while (7) by its corresponding imperfective simplex. Also (7), and not only (5), triggers the inference that Tonja was expected to sing her song.

(7)   Tonja   ne pela[IPF]   svoju   pesnju.
      T.   not sing[PAST.F.SG]   self's[F.ACC]   song[ACC]
      'Tonja wasn't singing/didn't sing her song.'

Romanova's (2006) account also inherits the problems that we observed with Padučeva's (1996) proposal: namely, first, the failure to distinguish between semantic components of perfective verbs and pragmatic factors having to do with obligations, expectations and the like on the part of the interlocutors, and second, the fact that the alleged presuppositions of perfective verbs fail to be present in all their uses, most notably in utterances of affirmative sentences.

2.3   Event Semantics
One illustrative example of an event semantics approach is Dočekal and Kučerová (2009). As is widely assumed, they take it for granted that all perfective verbs have a uniform meaning of telic predicates, drawing on Czech and Russian data. Telic predicates are equated with accomplishment predicates, which means that they are decomposed into two subevents, where e_1 is a process and e_2 is the result state (mainly following Giorgi and Pianesi 2001). Their main innovation is the claim that perfective verbs carry the 'activity presupposition' ('process' in our terms) tied to e_1 or 'the first homogeneous part of telic events'. The evidence for this claim comes from the observation that it exhibits the usual projective properties of a semantic presupposition: namely, it 'projects under negation and under a question operator.'

One immediate problem with this account is that the meaning of perfective verbs as a whole class cannot be equated with that of accomplishments (see also above the criticism of Romanova's (2006) account).

Another problem is the one that Dočekal and Kučerová (2009) noticed themselves: namely, imperfective verbs can also carry the 'activity presupposition'. A case in point is the class of secondary imperfective verbs (explicitly marked with the imperfective suffix *-yva-*) that are formed with the 'completive' (or 'terminative') prefix *do-*, as in (8a). The sentence (8a) denies that Vasya was about to finish reading the book yesterday, and implies that he read a part of it, but was nowhere near being close to finishing reading it. But notice that the same

inference – namely that Vasya read a part of the book – is also triggered by the sentence with the corresponding perfective verb (8b):

(8) a. Včera   Vasya ne dočityval[IPF]   tu knigu.
         Yesterday Vasya   not COMP.read[IMP.PAST.SG.M]   that book
         'Yesterday Vasya was not finishing reading that book.'
         Inference: He started reading that book.
    b. Včera   Vasya ne dočital[PF]   tu knigu
         Yesterday Vasya not COMP.read[PAST.SG.M]   that book
         'Yesterday Vasya did not finish reading that book.'
         Inference: He started reading that book.

Dočekal and Kučerová (2009) acknowledge that terminative (uses of) prefixes like *do-*, when used to form secondary imperfective verbs, are problematic for their account, because secondary imperfectives with such prefixes can also trigger the 'activity presupposition' just like perfective verbs. They set this problem aside for future research.

2.4 Summary and Questions
First, all the works summarized here share the claim that all and only perfective verbs can be decomposed into two parts, effectively have the bipartite structure of accomplishments. In this bipartite structure, the first part, 'process' or 'activity', is presupposed while the second, 'result', part is asserted. However, there is a number of perfective verbs that do not have the structure of accomplishments, i.e., that cannot be plausibly decomposed into a process and a result component (see Filip 2000, Filip and Rothstein 2005, and references therein).

   Second, the studies of perfective verbs, especially those conducted in the Russian tradition (here represented by Padučeva 2006 and Romanova 2006), often contain claims about the association of perfective verbs with certain speaker-oriented modalities; particularly prominent are speaker's normative and deontic expectations on the addressee. Such speech act related factors clearly lie outside of the lexical semantic structure of perfective verbs (which is not to deny that they may arise from the interaction of the lexical meaning of perfective verbs with pragmatic factors). This raises the question about the distribution and robustness of such pragmatic inferences that are allegedly associated with the uses/meaning of perfective verbs.

Third, despite frequent claims about the 'presupposition' of perfective verbs, there seems to be little reflection on the status of such claims, and if any concrete empirical evidence is adduced at all, it is their preservation under negation and in questions. However, not all that projects is a presupposition (see e.g., Chierchia and McConnell-Ginet 1990, Beaver 2001, Potts 2005), so further tests must be applied in order to establish the nature of the inferences associated with perfective verbs. This is the main question of the current paper.

3   Probing Perfectives: Presupposition or Implicature?

3.1   Presupposition?

3.1.1 Evidence against Semantic Presupposition. Projection from em-beddings, negation and antecedents of conditionals, is standardly used as a diagnostic test for a semantic presupposition. Let us consider the examples (9) and (10). In both cases, the inference of the affirmative sentences (9a) and (10a) survives under negation in (9b) and (10b), and hence would qualify as a presupposition:

(9)   a.   John won the marathon.
         b.   John didn't win the marathon.
                Inference: John participated in the marathon.
(10)   a.   John read all the books.
         b.   John didn't read all the books.
                Inference: John read some of the books.

However, the inferences in question do not always project a conditional out of the antecedent:

(11)   a.   If John won the marathon, he will celebrate tonight.
                Inference: John participated in the marathon.
         b.   If John read all the books, he will pass the exam.
                ↛ John read some of the books.

This difference is used to distinguish the inferences of (9) and (10): the projected component of (9a) is a semantic presupposition and the projected component of (10a) is a scalar implicature.

Now let us turn to Russian sentences with perfective verbs that denote accomplishments. As (12) shows, the alleged 'process presupposition', which is claimed to be triggered by perfective verbs, does not project out of the antecedent of a conditional, and hence it fails to exhibit one of the properties of semantic presupposition.

(12) Esli   Vasja pročital^{PF} učebnik, on sdast^{PF} èkzamen.
       if   Vasja PREF.read$_{PAST.SG.M}$ textbook, he pass$_{PRES.3SG}$ exam
       'If Vasja completely read the textbook, he will pass the exam.'
       ↛ Vasja read/began reading at least a part of the textbook.

It may also be observed that the alleged 'process presupposition' of sentences with perfective verbs (denoting accomplishments) is also easily defeasible. This speaks against its presuppositional nature too, on the assumption that a semantic presupposition is generally non-cancellable.[1] For instance, the discourse in (13) is felicitous even though the first sentence (equivalent to (2a) given at the outset) is followed by a second sentence that denies its alleged presupposition, namely, 'Ivan started reading the book.'

(13) Ivan ne pročital^{PF} ètu knigu. On daže ne otkryl eë.
       Ivan NEG PREF.read this book   he even NEG open   it$_{ACC.F}$
       'Ivan didn't read this book. He did not even open it.

3.1.2 Evidence against Pragmatic Presupposition. Theories of pragmatic presuppositions regard those as requirements on the common ground (see e.g., Heim 1983; Karttunen 1973; Stalnaker 1973; Shanon 1976). One good test for pragmatic presupposition is known as "Hey, wait a minute!" test, which builds on Shanon's (1976, p. 248) observation: "[u]pon uttering S, a speaker P pragmatically presupposes Q if it is suitable for the hearer to utter 'One moment, I did not know that Q' in response to S."

Using this test can show easily that the alleged 'process presupposition' of Russian sentences with perfective verbs that denote

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[1] The non-cancellability of semantic presuppositions is less reliable than projection tests.

accomplishments does not qualify as pragmatic presupposition. Consider the examples in (14):

(14) a. Katya pročitala^{PF} skazki   Puškina.
         Katya PREF.read$_{PAST.SG.F}$ fairy tales   Pushkin$_{GEN}$
         'Katya read the fairy tales by Pushkin completely through.'
     b. #Pogodi-ka! Ja ne znal, čto   ona ix   čitala^{IPF}!
         wait!   I   NEG knew that she them read
         'Wait a minute! I didn't know that she was reading them!'
     c. Pogodi-ka! Ja ne znal, čto   ona   umeet čitat'!
         wait   I   NEG knew that she   can   read
         'Wait a minute! I didn't know that she can read!'

(14a) is headed by the perfective verb *pročitala* 'she read completely (through)'. If pronounced with neutral intonation, it would be odd to follow it with (14b) that indicates the hearer's surprise about the alleged 'process presupposition'. In contrast, (14a) can be followed by (14c) which indicates that the ability of Katya to read is a pragmatic presupposition of (14a).

3.1.3 Summary. In this section, we used standard presuppositional tests to show that the 'process presupposition' that is claimed to be triggered by sentences with perfective verbs denoting accomplishments is not a matter of semantic or pragmatic presupposition.

3.2   Pragmatic Implicature
As Grønn (2004, p. 61) points out, "[t]he negation test in itself is not a sufficient argument for associating perfective accomplishments with a presupposition [of the existence of their process part, YZ&HF]." Instead, he proposes to treat it as a matter of pragmatic strengthening by the Gricean maxim of quantity (Grice 1975). He relies on speaker's and hearer's economy effort in communication that he takes to be related to "the Gricean idea that the best form-meaning pairs are the ones which minimize both the speaker's and hearer's effort (whose interests are, in a sense, conflicting)" (Grønn 2006, p. 71). He also assumes the markedness theory of Slavic aspect, according to which the perfective member of the aspectual opposition is marked, while the imperfective

member is semantically unmarked, i.e., unspecified with respect to the distinguishing semantic feature of Perfective.

Under negation, what we observe is aspectual competition: namely, when the existence of a whole (culminated) event is to be denied, the use of an unmarked imperfective, as in (15), is the default choice of the speaker:

(15) Ivan ne čital^IPF   ètu knigu.
       Ivan NEG read_PAST.SG.M   this book
       'Ivan did not read this book.'
       Interpretation: denial of the existence of a whole event.

If the speaker uses an utterance with the marked perfective verb, as in (16) (which is equivalent to (2a) given at the outset), the hearer infers that there was some attempt or activity on the part of the Agent which did not culminate because it would have been more economic for the speaker to use a sentence with an unmarked imperfective, if it were possible/relevant:

(16) Ivan ne pročital^PF   ètu knigu.
       Ivan NEG PREF.read_PAST.SG.M   this book
       'Ivan did not read this book completely through.'

Based on such data and observations, Grønn (2004, 2006) suggests that the alleged presupposition of perfective verbs is best seen in terms of an implicature, rather then in terms of a presupposition. Grønn's (2004, 2006) suggestion points in the right direction. In what follows, we propose that the existential inference associated with the process part of perfective verbs that denote accomplishments is a matter of scalar implicature.

4 Proposal: Scalar Implicature

4.1 *Background: Projection Theories*
In developing our approach to the analysis of the semantics of Russian perfective verb, recent findings in the research on presupposition projection are of particular importance. Building on the presupposition projection theories (e.g., Heim 1983; Schlenker 2008, and references

therein), Chemla (2009) provides experimental evidence that distinguishes the projection properties of presuppositions from those of scalar implicatures.

Among his most relevant insights is the following one: If a sentence *S* (e.g., (17a)) with the presupposition *P*(*x*) (17b) is embedded under universal quantifiers *every/each* or *no* (as in (17c) and (17d)) the presupposition of the whole sentence is universal: $\forall x{:}P(x)$, (17e). Hence, the presupposition is the same in sentences with a universal affirmation (*every/each,* (17c)) or a universal negation (*no,* (17d)).

(17) a. The student knows that he is lucky.
      b. The student is lucky.
      c. Each student knows that he is lucky. [= (4) in Chemla (2009)]
      d. No student knows that he is lucky.   [= (8) in Chemla (2009)]
      e. Each student is lucky.

This property does not hold for scalar implicatures: if a sentence *S* (18a) entails that *I*(*x*) (20b), then *S* embedded under *every/each* (18c) entails that $\forall x{:}I(x)$ (universal inference, (18d)) and *S* embedded under *no* (18e) implicates that $\exists x{:}I(x)$ (existential inference, (18f)).

(18) a. John read all books.   [= (13) in Chemla (2009)]
      b. John read some of the books.
      c. Each student read all the books.   [= (14) in Chemla (2009)]
      d. Each student read some of the books.
      e. No student read all the books.   [= (18) in Chemla (2009)]
      f. Some student read some books.

The universal inference like the one in (18d) in the universal assertion context such as (18c) is a trivial property of entailments. The existential inference (18f) in the universal negation context such as (18e) follows from the Gricean maxims and the construction of alternatives. Let us illustrate this point with a simple example. First, recall how scalar implicatures that involve a scalar item (e.g., *all)* in a downward entailing context (here negation) are derived (following suggestions in Grice 1975; Ducrot 1969; Horn 1972, among others).

(19) a. John didn't read all the books.   [= (12) in Chemla (2009)]
      b. *Alternative:* John didn't read any of the books.
      c. *Scalar implicature:* John read some of the books.

Sentences with *all* (19a) and *any* (19b) belong to an implicational scale that consists of a set of linguistic alternatives of the same grammatical category which can be arranged in a linear order by degree of informativeness or logical (semantic) strength. Sentence in (19b) is an alternative to (19a), whereby (19b) is logically stronger than (19a). If the speaker does not use (19b), the most natural assumption on the part of the hearer is to conclude that the alternative sentence (19b) is false. The negation of (19b), "it is not the case that John didn't read any of the books" or "John read some of the books," is then an indirect scalar implicature (19c) of (19a) (the two negations cancel each other out).

Similar reasoning works for deriving an implicature (20c) from (20a). The sentence (20b) is an alternative to (20a). As this alternative is informationally stronger, but was not uttered, it gets negated, giving rise to the scalar implicature in (20c).

(20) a. No student read all the books.   [= (18) in Chemla (2009)]
      b. *Alternative:* No student read any book.
      c. *Scalar implicature:* (At least) one student read some of the
          books.

4.2   Empirical Evidence: Questionnaire
If the results reported in Chemla (2009) are correct, then embedding sentences that contain inferences of unknown nature under negative universal quantifiers can be seen as a test for distinguishing between presuppositions and scalar implicatures. The reasoning is then as follows, put in the simplest terms: if the inference is universal, the embedded sentence contains a presupposition trigger; if the inference is existential, the embedded sentence involves a scalar implicature. To illustrate how this test can be applied to Russian data consider (21):

(21) a. Nikto iz   nas ne pročital   učebnik.
         nobody of   us   NEG PREF.read_{PAST,SG.M}   textbook
         'None of us read the textbook.'
     b. *Alternative:* None of us read any part of the textbook.
     c. *Scalar implicature:* Some of us read/started reading at least a
         part of the textbook.
     d. *Presupposition:* All of us read/started reading at least a part of
         the textbook.

The inference in (21c) is existential and arises as the negation of the
stronger alternative (21b) to (21a). If only this inference is attested, the
sentence (21a) contains a scalar item that triggers an implicature. If, on
the other hand, the inference (21d) is attested,[2] (21a) must contain a
presupposition trigger.

   To test which inferences native speakers of Russian get, we ran a
simple questionnaire. Similarly to the experimental design by Chemla
(2009), we provided participants with two sentences and asked them to
judge if the first one suggested (*predpolagaet* in Russian instructions) the
second one. We also asked to assume that the first sentence was uttered
by a reliable, honest and well-informed speaker (*nadežnyj, iskrennij i
informirovannyj sobesednik* in Russian) in order to establish a natural
context in which the Gricean maxims could be applied, which was a
necessary condition for the derivation of scalar implicatures.

   For the test material, we had sentences of three different types. The
first group of sentences were sentences like (21a) that were designed to
test the type of inference associated with perfective accomplishments.
They were constructed by means of embedding Russian sentences that
contained perfective accomplishments under negative universal
quantifiers (analogous to examples like (12) and (18) from Chemla
(2009)). Apart from (21), another example of such sentence is (22).

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[2] Note that in this case, in fact, both (21c) and (21d) must hold, as (21c) is a weaker
statement than (21d).

(22) a. Nikto iz moix studentov ne dočital statju.
nobody of my students NEG COMP.read$_{PAST.SG.M}$ article
'None of my students finished reading the article.'
Tested inferences:

    b. Vse studenty načali čitat' statju.
All student.PL start$_{PAST.PL}$ read article
'All students started reading the article.'

    c. Kto-to načal čitat' statju.
Somebody start$_{PAST.SG.M}$ read article
'Somebody started reading the article.'

The second group of sentences included perfective sentences denoting accomplishments that contained negation but no quantifier. They were intended to explore if/when native speakers of Russian would report inferences concerning the process component and/or speech-act related speaker-oriented modalities like his/her normative and deontic expectations on the addressee. Some representative examples are given below:

(23) a. Vasja ne sdelal domašnee zadanie.
Vasja NEG PREF.do$_{PST.SG.M}$ homework
'Vasja didn't do his homework.'
Tested inferences:

    b. Vasja načinal delat' domašnee zadanie.[3]
Vasja start$_{PAST.SG.M}$ do homework
'Vasja started doing the homework.'

    c. Vasja dolžen byl sdelat' domašnee zadanie.
Vasja obliged be$_{PAST.SG.M}$ do homework
'Vasja had to do the homework.'

(24) a. Vasja ne dodelal domašnee zadanie.
Vasja NEG COMP.do$_{PST.SG.M}$ homework
'Vasja didn't do his homework.'

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[3] An imperfective verb *načinal* 'started' is used here as the more neutral one in comparison with the perfective variant *načal* 'has started' that tends (in the absence of a temporal adverbial) to denote an event in the recent past.

Tested inferences:

b. Vasja   načinal   delat'   domašnee zadanie.
    Vasja   start$_{PAST.SG.M}$ do   homework
    'Vasja started doing the homework.'
c. Vasja   dolžen byl   sdelat' domašnee zadanie.
    Vasja   obliged be$_{PAST.SG.M}$ do   homework
    'Vasja had to do the homework.'

The last group included control sentences with presupposition triggers like 'know' and possessive pronouns. One illustrative example is the following one:

(25)   Petja ne   znaet,   čto Katja včera   xodila v   kino.
       Petja NEG know$_{PRES.3SG}$ that Katja yesterday went in cinema
       'Petja does not know that Katja went to cinema yesterday.'
       Tested inference:
       Katja včera   xodila   v   kino.
       Katja yesterday go$_{PAST.SG.F}$ in   cinema
       'Katja went to cinema yesterday.'

We collected answers from 100 native speakers of Russian, using the free version of Survey Monkey (surveymonkey.com) questionnaire platform. The questionnaire design differed from that of Chemla (2009) with respect to possible answers. Anticipating the difficulty of some sentences and inferences, we allowed not only two variants "yes" and "no", but also the weaker versions "probably yes" and "probably no". The answers then were assigned numerical values (1 for "no", 2 for "probably no", 3 for "probably yes" and 4 for "yes") and the mean values were calculated. Control sentences received the rating of 3.61.

Our results strongly suggest that the inferences in question do not have the properties of presupposition. We observed a significant difference in the acceptance rates of existential and universal inferences when the target sentence involved the universal negation. In this case, the universal inferences (e.g., 'all of us at least started reading the textbook', as in (21d) and (22b)) were strongly dispreferred (rating 1.65), while the existential inferences (i.e., 'some of us started reading the textbook', as in (21c) and (22c)) were accepted (rating 3.11). Such behavior, according

to the results of Chemla (2009), corresponds to that of scalar implicatures and not presuppositions.

As far as the question about the presence of speech-act related speaker oriented modalities is concerned, which are emphasized by Padučeva (1996, 2011) and Romanova (2006), participants highly rated (3.16 overall rating) the relevant proposed inference, of the type given in (23b) above. This indicates that their observations are empirically valid. It is an open question how exactly they should be motivated based on independently motivated generalizations concerning the functioning of the Russian aspectual system and its interactions with speech-act factors.

In contrast, we did not find sufficient empirical evidence for the alleged semantic process presupposition, which plays a role in the analysis of perfectivity in Padučeva (1996, 2011), Romanova (2006) as well as in Dočekal and Kučerová (2009). Inferences of the type given in (23a) seem to be dispreferred (rating 1.39), with one notable exception: namely, sentences headed by perfective verbs that contain the completive prefix *do-*. For such sentences, an inference concerning the process component of denoted accomplishments (see (24a)) was rated high (3.39). However, this result is clearly tied to completive prefix *do-*, rather than to perfective aspect of verbs in general.

5   Conclusion

In this paper we have shown that the projection properties of Russian perfective verbs in downward entailing contexts (under the universal quantifier *no*) indicate that the projected inference concerning the 'process' part of perfective accomplishments is a scalar implicature, rather than a presupposition, contrary to common analyses of Russian perfective verbs. Although our main data come from Russian, the methodology developed here is extendable to other Slavic languages.

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