Aspectual opposition and rivalry in Russian are not discrete: new evidence from experimental data

Laura A. Janda, Anna Endresen & Robert J. Reynolds

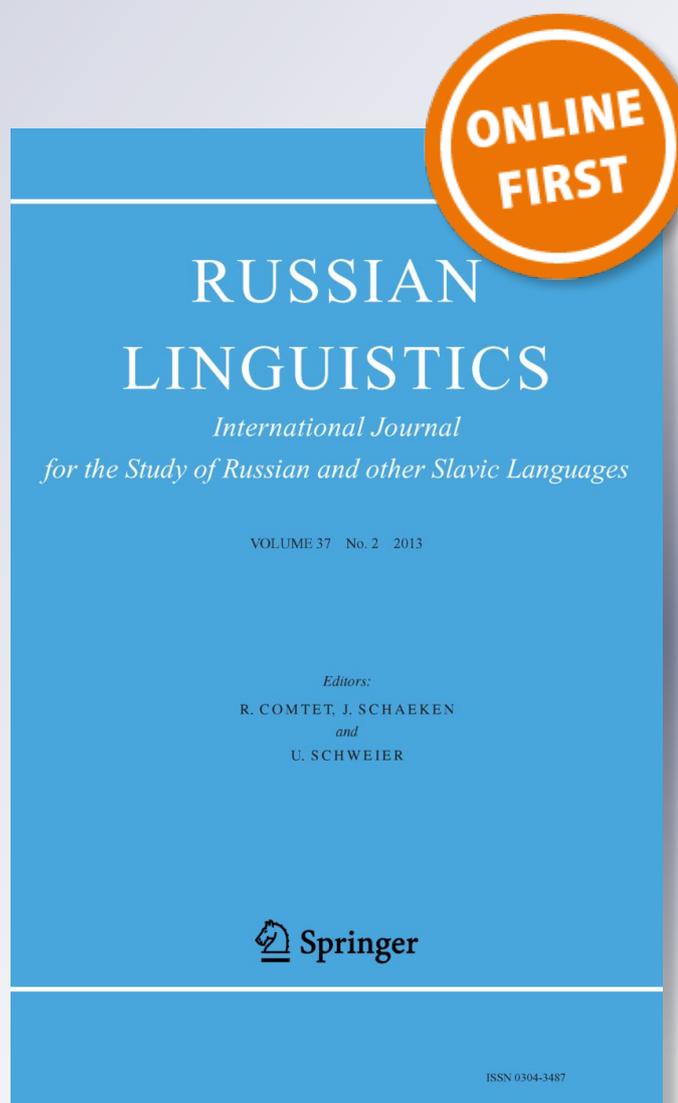ONLINE FIRST

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Противопоставление и конкуренция видов в русском языке не дискретны: новые экспериментальные данные

Laura A. Janda[1] · Anna Endresen[1] · Robert J. Reynolds[2]

Abstract We apply experimental data to identify contexts in which Russian aspect is categorically determined ('categorical contexts') and contexts in which both aspects can appear ('overlapping contexts'). Traditional analyses suggest that these contexts are distinct and that certain features are typical for each type of context. Such analyses tend to rely on constructed examples typically consisting of a single sentence. Our experiment, by contrast, is based on extensive (over 1100 words each) authentic texts (created by and for native Russians), and the identification of contexts is not *a priori*, but emerges from contexts normed by over 500 native speakers. We present two main findings: 1) the distinction between categorical contexts and overlapping contexts is scalar, not discrete; and 2) a multitude of factors distinguish the two types of contexts, modality in particular is prominent in overlapping contexts, a factor that has received little prior attention. Our data both confirms and significantly extends previous analyses by presenting empirically justified factors that distinguish categorical from overlapping contexts.

Аннотация В статье на основе экспериментальных данных рассмотрено два типа контекстов: контексты, в которых русский глагол можно употребить только в одном виде, в совершенном или несовершенном (т.е. где вид задан однозначно, без вариантов, или 'категорические контексты') и контексты, в которых могут использоваться оба вида глагола (т.е. где области употребления совершенного и несовершенного видов пересекаются, или 'пересекающиеся контексты'). Традиционно в аспектологии принято различать данные типы контекстов, считая, что для каждого типа свойственны свои характеристики. Подобные выводы до сих пор основывались в основном на искусственно сконструированных примерах, как правило, состоящих из одного

✉ L.A. Janda
laura.janda@uit.no

A. Endresen
anna.endresen@uit.no

R.J. Reynolds
robert_reynolds@byu.edu

[1] UiT The Arctic University of Norway, Tromsø, Norway

[2] Brigham Young University, Provo, USA

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предложения. В проведенном нами эксперименте, напротив, были использованы большие (более 1100 слов каждый) аутентичные тексты (созданные носителями русского языка и для носителей русского языка), где разделение контекстов не было задано изначально, а было выявлено на основе ответов более 500 информантов. В статье представлено два главных вывода: 1) категорические и пересекающиеся контексты не являются дискретными, отдельными друг от друга явлениями, а образуют единый континуум, шкалу; и 2) разграничение двух типов контекстов возможно благодаря целому ряду факторов. В пересекающихся контекстах особенно выделяется роль модальности, до сих пор недостаточно изученной как фактор выбора вида. Собранные нами данные подтверждают и расширяют результаты предшествующих исследований за счет описания эмпирически обоснованных факторов, позволяющих разграничить категорические и пересекающиеся контексты.

1 Introduction: Two types of contexts and the selection of Russian aspect

Speaking in broad terms, traditional Russian aspectology tells us that there are two kinds of contexts: contexts in which only one aspect is acceptable, and contexts in which both aspects are acceptable. We can term these two contexts 'categorical contexts' vs. 'overlapping contexts'. The description of these two contexts has primarily been arrived at via introspection on the basis of constructed examples. We endeavor instead to arrive at a description that emerges from experimental data based on extensive authentic texts. In so doing, we show that the relationship between categorical contexts and overlapping contexts for Russian aspect is complex and scalar. We find confirmation for factors that have been described in previous scholarship, and we identify overlapping contexts as well as additional factors that have previously been largely overlooked.

In the present section we review the history of Russian aspectology, particularly as it is relevant to defining categorical vs. overlapping contexts. We focus on the description of aspectual opposition in Russian and contexts of aspectual neutralization, as opposed to contexts in which the two aspects compete and both can be used. Since the scholarly literature on Russian aspect is extensive, and most of it takes classic works as points of departure, we will not attempt to provide a full overview of the literature. This is particularly true for works by Maslov in relation to overlapping contexts. In order to leave space for our own study, we focus only on the main points and bring in the larger perspective of other scholarship only where it is most relevant, as in the discussion in Sect. 3.2.6.

Section 2 details our experiment and the scalar structure of the data. In it we select two subsets of the data that best represent the two types of contexts for further analysis. This selection is based on ratings by over 500 native speakers of Russian, who responded to the appropriateness of the perfective vs. imperfective verb forms in 673 contexts. The selection is thus empirically objective, not motivated by *a priori* assumptions. Section 3 is an in-depth investigation of the two subsets of data and the contexts they present, comparing our results with the expectations established in prior scholarship. Factors that other scholars have suggested are found in our data as well, but our data puts these factors into a wider perspective, showing which are more important among them, and our data also turns up additional factors, particularly the influence of modality and subjective nuance on the part of the speaker. We summarize our findings in Sect. 4.

1.1 Categorical contexts for the selection of Russian aspect

Traditional structuralist accounts of Russian aspect describe two kinds of contexts that we can term 'categorical': 1) contexts of aspectual antonymy, in which the perfective vs. imperfective

are semantically opposed to each other, with one excluding the other; and 2) contexts of neutralization, in which the imperfective is selected to the exclusion of the perfective despite the fact that semantically one might expect a perfective.

1.1.1 Aspectual antonymy

In the structuralist framework, aspect was analyzed in terms of a binary privative opposition, in which the perfective aspect is the semantically marked category and the imperfective aspect is the semantically unmarked one. This view implies that the marked member carries a certain semantic property (a 'mark') that the unmarked member does not have, be it *predel'nost'* 'boundedness', *celostnost'* 'totality', or *perexod v novoe sostojanie* 'change of state'.

Markedness theory was originally introduced by Trubetzkoy (1931, 1939) with regard to phonological distinctions, but was later applied to grammatical categories and morphology. In particular, Roman Jakobson (1971[1932]) used these notions to describe Russian aspect. In his famous article *Zur Struktur des russischen Verbums*, first published in 1932, Jakobson calls the perfective aspect in Russian the "merkmalhaltig" 'marked', and the imperfective aspect the "merkmallos" 'unmarked' member of the aspectual opposition (ibid., p. 6). The marked member signals the property A, whereas the unmarked member fails to do so (non-A). According to Jakobson, the Russian perfective aspect is marked in relation to the imperfective aspect, as the former refers to the absolute completion of an event, whereas the latter is 'non-committal with respect to completion or non-completion' (Jakobson 1971[1932], p. 6). This was a popular account of Russian aspect in terms of a contrastive privative opposition, and we find it in numerous works by Soviet, post-Soviet, and Western scholars (Bondarko 1971, pp. 226–234, 2002, p. 375; Forsyth 1970, pp. 6–8; Maslov 2004[1948]; Zolotova, Onipenko, and Sidorova 2004, p. 26).

In most uses of aspect, the perfective and imperfective are in complementary distribution, with the perfective required when the context describes a situation that is completed or bounded in some way, as opposed to the imperfective in other contexts. Perfective verb forms describe achievements and accomplishments, events that are sequenced and foregrounded. Imperfective verb forms describe activities and states without reference to any boundaries, backgrounded situations that can be simultaneous with other events.

Most descriptions of Russian aspect focus primarily or exclusively on these contexts. This is true not only of structuralist, feature-based descriptions, but also other, more recent types of descriptions, such as Padučeva's (1996) analysis of the perfective and imperfective as equipollent aspectual values, and Janda's (2004) analysis of Russian aspect in terms of a conceptual metaphor in which the PERFECTIVE IS A DISCRETE SOLID OBJECT and the IMPERFECTIVE IS A FLUID SUBSTANCE (ibid., p. 489). Among the primary characteristics of contexts for aspectual antonymy are adverbs and adverbial phrases such as *uže* 'already', *vdrug* 'suddenly', which usually serve as cues for the perfective; and *vsegda* 'always', *každyj raz* 'every time', which usually serve as cues for the imperfective, along with phasal verbs like *načat'* 'begin', *prodolžat'* 'continue', which are followed by imperfective infinitives.

1.1.2 Aspectual neutralization

Neutralization is a structuralist term that describes contexts in which the two members of a privative opposition are not contrasted, and only one member can appear. It is the unmarked member that appears in the so-called 'position of contextual neutralization', that is, in the environment in which the opposition is suppressed. For Russian aspect, this means that there

are certain contexts in which only the imperfective can be used, even when describing completed, sequenced events.

The two classic examples of positions of full and obligatory aspectual neutralization in Russian are the 'historical present', which describes past events as if they are unfolding in the present (Dickey 2000, chap. 4, pp. 126–154), and the 'stage present', which describes events as they unfold or as if represented in a play (Bondarko 1971, pp. 226, 230; Dickey 2000, chap. 5 "running instructions and running commentaries", pp. 155–174). These two contexts for the obligatory use of the imperfective in position of neutralization are illustrated in (1a, b) cited by Bondarko (1971, p. 227):

(1) a. Imperfective non-past in historical present
         U samogo kryl'ca gimnazii Grigorenko kruto *ostanavlivaet*^ipfv lošad' i, posapy-
         vaja, *vylezaet*^ipfv iz proletki. On *privjazyvaet*^ipfv lošad' k čugunnomu stolbu i, vy-
         taščiv iz proletki kruglyj černyj svertok, *skryvaetsja*^ipfv v dverjax pod"ezda.
                                                                    (Beljaev. Staraja krepost')
         'Grigorenko abruptly *stops* his horse right by the steps of the gymnasium and,
         panting, *climbs* out of the cab. He *ties up* the horse to an iron pole and, after
         taking a round black package out of the cab, he *disappears* in the door of the
         entry.'
     b. Imperfective non-past in stage present
         Žan na terrase s buketom cvetov. Uvidev Ninu, *prjačet*^ipfv buket za spinoj,
         isčezaet^ipfv i *vxodit*^ipfv uže bez buketa.   (Gor'kij. Jakov Bogomolov)
         'Žan is on the terrace with a bouquet of flowers. After seeing Nina, he *hides* the
         bouquet behind his back, *disappears*, and *comes in* again without the bouquet.'

All of the events represented by imperfective non-past verb forms in these examples describe completed, sequenced events of the type that otherwise would require perfectives (for example in the past tense). The obligatory use of the imperfective is what makes these categorical contexts. Bondarko argues that the imperfective 'allows' for this use but preserves its meaning at the same time. The term neutralization might be considered rather misleading because the two aspects in such contexts do not have identical semantics, as Bondarko (1971, p. 233, 2002, p. 376) himself points out.

In addition to these contexts of full neutralization, Bondarko (1971, p. 226) refers to some contexts of 'partial' neutralization, in which the choice of aspect is not categorical. These are the same contexts as those identified by Maslov as aspectual synonymy (involving repeated events, potential events, and transitional examples), and they are the topic of Sect. 1.2.

1.2 Overlapping contexts for the selection of Russian aspect

In contexts in which both the perfective and imperfective aspect are acceptable in Russian, Maslov (2004[1948], pp. 105–108) tells us that the two aspects approach synonymy, a situation that is relatively uncommon and involves peripheral meanings of the two aspects. The relationship between the aspects in these contexts is sometimes referred to as *konkurencija vidov* 'aspectual rivalry'. Despite Maslov's claim of synonymy, he consistently recognizes that a perfective verb form will always have a slightly different meaning than an imperfective verb form, even in such contexts (cf. also Bondarko 1971, pp. 226, 233, 2002, p. 376). The three main contexts of overlap that Maslov (2004[1948], pp. 105–108) identifies are: 1) bounded durations, 2) repeated events, and 3) potential events.

1.2.1 Bounded durations

Bounded durations are expressed by delimitative *po-* and perdurative *pro-* perfectives as opposed to corresponding simplex imperfectives, as in Maslov's (2004[1948], p. 105) examples:

(2) a. Perdurative perfective with *pro-*
         On *progovoril*[pfv] polčasa.
         'He *talked* for half an hour.'
      b. Simplex imperfective
         On *govoril*[ipfv] polčasa.
         'He *talked* for half an hour.'

The difference between the two aspects is that the perfective focuses more on the totality of the event, whereas the imperfective focuses on the process. Here the relationship between the two aspects is restricted to a temporal Aktionsart rather than the more neutral relationship of aspectual pairs, which is the case for the other types of overlapping contexts identified by Maslov.

1.2.2 Repeated events

Events that are repeated a number of times can be viewed either as a single summed event with the perfective, or as a series of individual events, emphasizing the repetition with the imperfective (Forsyth 1970, chap. 6, pp. 13–193). Maslov (2004[1948], p. 106) gives this set of examples:

(3) a. Perfective with repeated event
         On neskol'ko raz *obernulsja*[pfv].
         'He *turned around* several times.'
      b. Imperfective with repeated event
         On neskol'ko raz *oboračivalsja*[ipfv].
         'He *turned around* several times.'

A constraint on this type of aspectual overlap is the reversibility of the event, since the perfective is less felicitous for reversible events: *on dva raza otkryval*[ipfv] *okno* 'he opened the window twice' is better than *on dva raza otkryl*[pfv] *okno* 'he opened the window twice'.

1.2.3 Potential events

Some events are potential ones because they are motivated by habit or capacity, as in Maslov's (2004[1948], p. 107) example:

(4) a. Perfective with potential event
         U nego takaja privyčka—kak vernetsja s progulki, srazu *otkroet*[pfv] okno.
         'He has a habit—as soon as he comes back from his walk, he immediately *opens* the window.'
      b. Imperfective with potential event
         U nego takaja privyčka—kak vernetsja s progulki, srazu *otkryvaet*[ipfv] okno.
         'He has a habit—as soon as he comes back from his walk, he immediately *opens* the window.'

This example illustrates what Maslov terms the *nagljadno-primernoe značenie* 'illustrative example meaning' of aspect. Descriptions of habits lean more toward the use of imperfective, whereas capacity for a potential action is more likely to be expressed by perfective.[1]

1.2.4 Transitional examples

In addition to these three types of aspectual overlap, Maslov (2004[1948], p. 104) mentions a 'transitional zone' between the extremes of aspectual antonymy and aspectual synonymy, where both aspects can be used with minor differences in meaning motivated by the attitude of the speaker. Here Maslov includes the use of non-past forms of both aspects to convey proximate future meaning, as in *zavtra poedu*pfv / *edu*ipfv *v Moskvu* 'tomorrow I will go / go to Moscow', in which the imperfective indicates more of an intention rather than a prediction as stated by the perfective.[2] Also in this transitional zone we find the general-factual use of the imperfective, as in *Ty posylal*ipfv *emu knigu?* 'Did you send him the book?' (the sending of the book was planned or expected; the action is viewed as a part of a specific situation) vs. the specific-factual use of the perfective, as in *Ty poslal*pfv *emu knigu?* 'Did you send him the book?' (the sending of the book was at all possible; the action is viewed generally, without focus on any circumstances; cf. Maslov 2004[1948], pp. 99, 102–104), in which the choice of aspect is motivated by the pragmatic expectations of the speaker (Dickey 2000, chap. 3, pp. 95–125; Maslov 2004[1948], p. 104).

1.3 Summary: What we should expect given prior scholarship

Given the research described above, we should expect choices between perfective and imperfective aspect in Russian to be of two kinds: 1) categorical choices in which only one aspect is possible, associated with adverbial and phasal verb cues, and 2) overlapping choices in which both aspects can be used, albeit with meaning differences that range from minor to near-synonymy.

However, there is reason to wonder how crisp the distinction between categorical and overlapping contexts really is. Maslov gives us some perspective on the places where Russian aspect 'leaks' in the sense that the two aspects are not as strictly opposed as one would expect from the structuralist account of privative binary relationships, which was mainstream at the time of Maslov's investigations. These facts of peripheral meanings and overlap are not compatible with a structuralist view of language, but instead open the door to a view of language that involves scalar phenomena. Bondarko (1971, pp. 230–231) likewise 'hedges' on the strict criteria of structuralism when he speaks of 'partial neutralization'.

The expectation of an association between cues and categorical contexts for aspect has been called into question by a recent study. Reynolds (2016) aggregated all known cues

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[1]Cf. Dickey (2000, chap. 2, pp. 49–94). Note the perfective forms expressing capacity for potential actions in this example from V. Orlov's novel *Al'tist Danilov*, cited by Nesset (2009, p. 70):

(i) Ni Danilovu, ni v sobstvennosti Muravlevym Kudasov ne nužen, odnako oni ego terpjat. [...] Vse ravno on *pridet*pfv, *izvinitsja*pfv, i *sjadet*pfv za stol.
    'Neither Danilov, nor in particular the Muravlevs need Kudasov, although they tolerate him. Nevertheless, he *comes*, *excuses himself* and *sits down* at the table.'

[2]Cf. Bulygina and Šmelev (1992, p. 109) who offer a similar, but slightly more nuanced interpretation of this type of context, namely that the imperfective refers to a future event that is scheduled to occur, and this fact is about the present tense regardless of whether the event ever actually does occur.

for Russian aspect from textbooks and reference grammars and checked for patterns of co-occurrence with Russian verbs based on data in the Russian National Corpus. Remarkably, only 2% of Russian verbs co-occur with a known cue for either the perfective or imperfective aspect. In other words, the majority of uses of Russian aspect lack overt cues. If the majority of contexts are categorical, this means that most categorical contexts are categorical despite the absence of a cue.

On the basis of an experiment, we identify contexts that native speakers of Russian experience as categorical vs. overlapping and explore the factors that contribute to differences in responses. We focus especially on interpretations that support overlapping contexts, such as modality.

2 The experiment and the data

Since our purpose is to objectively discover factors that influence aspect in Russian, we need to find data that represents both possibilities: 1) contexts in which the choice of aspect is categorical, meaning that one aspect is correct and the other is unacceptable, and 2) contexts in which both aspects are acceptable. This section describes the way in which we obtained data suited to address our research questions.

2.1 The experiment

The data examined in this article is a subset of data collected in a survey experiment conducted over the internet in September 2016 (Janda and Reynolds 2019). 501 adult native speakers of Russian were presented with stimuli representing three written genres (fiction, journalism, and popular science) and three spoken genres (free narration, guided narration, and interview; see descriptions of stimuli in Table 1). All stimuli were authentic unedited texts of between 1116 and 1617 words created independently of our experiment, and each participant in our experiment was randomly assigned to one of the stimuli. Between 72 and 99 participants responded to each stimulus text.

Participants were tasked with judging the acceptability of perfective and imperfective verb forms in the context of stimuli texts. For each verb form in the original text for which it was morphologically possible to produce a verb form of the opposite aspect,[3] participants were confronted with both a perfective verb form and an imperfective verb form, and were asked to rate both forms on a three-point scale of 'excellent' vs. 'acceptable' vs. 'impossible'. Rating of the two forms was independent; paired forms could receive the same or different ratings. Each stimulus text contained between 80 and 150 such verb pairs, thus each participant rated between 160 and 300 verb forms. Participants were not told which form had appeared in the original text. Participants were allowed to spend as much time as they wished responding, were allowed to go back and change responses, and were prompted to complete all items before submitting their answers.

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[3] 'Morphologically possible' here refers to wordforms of the opposite aspect that would preserve the lexical meaning, tense, and modality of the original form. This means that certain types of verbs and verb forms were not tested in this experiment, among them perfectiva and imperfectiva tantum verbs, participles, gerunds, and -*sja* passives.

Table 1 Stimuli used in the experiment. Full versions of the stimuli and responses can be accessed at http://doi.org/10.18710/BFFMPH in the Tromsø Repository of Language and Linguistics; for the table cf. also the readme.pdf at the website indicated

Genre	Title	Abbreviations	Source
Fiction	*Besprizornik Žuk* / 'Beetle, the Vagrant Boy'	Beetle, BZh	© 2015 Fineeva Elizaveta Biblioteka Maksima Moškova
Journalistic Prose	*Počemu neftjanoj summit v Doxe provalilsja* / 'Why the Petroleum Summit in Doha Failed'	Summit, NS	Mixail Krutixin, Carnegie Moscow Center © 2016
Scientific-Technical Prose	*Učenye vyjasnili, počemu bakteriofagam trudno borot'sja s immunnoj sistemoj bakterij* / 'Scientists have discovered why bacteriophages have a hard time battling with the immune system of bacteria'	Phages, UV	Aleksandr Markov, elementy.ru 18.04.2016
Spoken Narration	*Istorija o tom, kak na našej obščažnoj kuxne pojavilsja tot samyj pervyj želten'kij znak* / 'The story of how the first yellow sign got to the kitchen in our dorm'	Yellow Sign, Ist	From the corpus: *Rasskazy o snovidenijax i drugie korpusa zvučaščej reči* / 'Narrations of dreams and other oral corpora' (A. A. Kibrik et al.) © 2016
Guided Spoken Narration	Moscow State Linguistic University Video 3	MSLU, MGLU	The Multimodal Communication and Cognition Laboratory at Moscow State Linguistic University (Alan Cienki, Olga Iriskhanova) © 2014
Radio Interview	Ivan Dmitrievič	Ivan D., ID	GTRK "Lipeck". Broadcast from the *Vstreči* / 'Meetings' series, November 2004

2.2 Results of previous analysis

In Janda and Reynolds (2019) we present a regression model of the entire dataset. In that model the dependent variable was the rating, represented as three ordered categories: 'excellent' vs. 'acceptable' vs. 'impossible'. Among the independent variables, the difference between a token that matched the original aspect ('matches original' = yes) vs. one that was of the opposite aspect ('matches original' = no) was found to give by far the largest main effect in predicting the rating of an item. A number of other independent variables were included in the model: 1) logarithm of relative frequency of the token being rated: the corresponding token of the opposite aspect ('log relative frequency'; see explanation in Sect. 2.4), 2) the text that the test item was in ('text', see Table 1), 3) the aspect of the token being rated ('aspect' perfective vs. imperfective), 4) the subparadigm of the token ('subparadigm' past, future, imperative, infinitive), 5) the presence of a known cue for aspect ('cue match', such as phasal verbs or temporal adverbials), and 6) the age of the participant ('age'). Our analysis showed that these six variables had very little effect on the overall dataset. 'Matches original' is the only strong predictor variable, but the participants did not have access to this information, since they were only given two tokens to rate for each test item with no indication of which one was in the original text. This means that there must be additional cues present in

the context that guide native speakers in recognizing whether only one aspect or both aspects are appropriate. The present article is a first attempt to ferret out the additional cues.

Even the variable 'matches original' is, however, not uniformly predictive of the rating of aspectual forms. 'Matches original' is a good predictor for the majority of test items, meaning that for these items most participants gave the token of the original aspect an 'excellent' rating and the token of the opposite aspect an 'impossible' rating. But there are also test items for which both aspectual forms received a majority of ratings in the 'excellent' or 'acceptable' category. And there are many test items that fall between these two extremes.

2.3 Further analysis of data distribution and subsetting the data

We take the analysis a step further in the present article by showing the distribution of responses in Fig. 1, which compares the average rating of the two tokens for each verb pair: the average rating of the original token (the aspect that was used in the original text) is compared to the average rating of the non-original token (the aspect opposite to the one in the original text). In order to create Fig. 1, the three ratings were scored as 'impossible' = 0, 'acceptable' = 1, and 'excellent' = 2.[4] In Fig. 1, each dot represents both ratings, presented as average ratings over all participants for each test item pair. The rating of the original token appears on the x-axis, with the rating of the opposite aspect on the y-axis. Purple dots represent ratings of items for which the original token was perfective, green dots represent original imperfectives. The labels Tp and Ti replace dots in cases in which there was a known cue ('trigger') for perfective or a known cue for imperfective.

Given the traditional narrative of Russian aspect described in Sect. 1, we might expect there to be two groups of ratings, one showing the contexts in which contrast and neutralization place an absolute requirement on the choice of only one aspect, and another group of

Fig. 1 Comparison of weighted average ratings for original vs. non-original tokens

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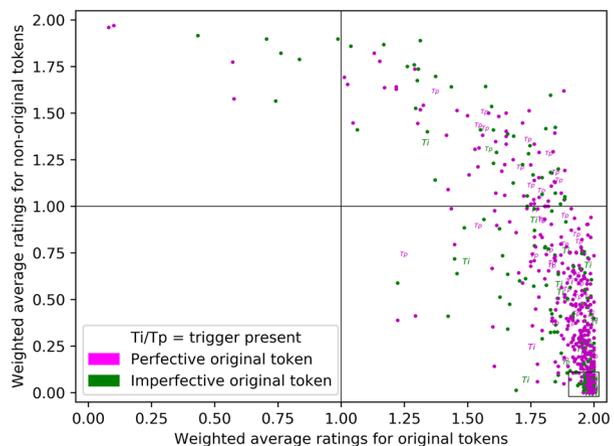
[4]We are aware of the potential drawbacks of assigning numerical values to Likert-scale evaluations such as the one used in our study, particularly the fact that the distances between the evaluations on the scale might not be equal. However, there is growing evidence that the results of statistical tests where these values are treated as interval data yield very similar results to tests in which they are treated as ordinal data (see Endresen and Janda 2016 for examples and extensive theoretical discussion of this issue). Furthermore, the large size of our study increases the likelihood that individual differences among participants would be corrected for by the sheer mass of data. While Fig. 1 inevitably presents some distortion of the data, the overall picture of a continuum is accurate. Furthermore, we use the numerical scores only for the purpose of visualization here, not as input into any statistical model.

Table 2 Combinations of values across the quadrants of Fig. 1

Top-left	Top-right
Original receives <u>low</u> rating	Original receives <u>high</u> rating
Non-original receives <u>high</u> rating	Non-original receives <u>high</u> rating
2% of data	17% of data
Bottom-left	**Bottom-right**
Original receives <u>low</u> rating	Original receives <u>high</u> rating
Non-original receives <u>low</u> rating	Non-original receives <u>low</u> rating
(No data)	81% of data

ratings in which both aspects receive approximately equal ratings, perhaps with a few transitional examples. In other words, we would expect to see one clump of ratings at the bottom-right and another clump at the top-right, with few ratings in between. However, Fig. 1 shows a continuum of responses in which no clear groups or natural boundaries emerge. This is in itself an important finding about the relationship between contexts in which only one aspect is possible and contexts in which both aspects are possible. These are not merely two distinct categories of contexts. Instead it is the case that most contexts combine, to varying extents, both expectations: while there are some contexts that are categorical (the data in the small box in the extreme bottom-right corner of Fig. 1), most of the contexts in which one aspect is preferred (the whole bottom-right quadrant of Fig. 1) permit some variation. And while there are some contexts that give both aspects high ratings (top-right quadrant of Fig. 1), most of these contexts show some preference for the original aspect. This situation can be likened to that of the color spectrum where two adjacent colors, for example green and blue, are relatively distinct at the extreme edges, but in between there is a wide band of 'grue' in which the distinction is unclear and is interpreted differently by different people.

We divided up this data by imposing boundaries motivated by the overall trends of ratings. We subdivided Fig. 1 into four quadrants, each of which shows a different tendency for rating the original vs. non-original tokens as described in Table 2. The bottom-right quadrant shows the contexts with relatively categorical ratings.[5] By contrast, the top-right quadrant is distinguished by the fact that both aspects are acceptable to most participants.

If we want to test the traditional account of what separates contexts in which aspect choice is absolute from contexts in which the two aspects compete, we need data that addresses the two extremes, similar to the extremes of focal green and focal blue, since these contexts will give us the clearest separation. We can identify two broad groups of test pairs, one in which only one aspect is preferred (bottom-right), and another in which both aspects are fully acceptable (top-right). However, there are still some characteristics of this data that could be problematic. One is that there is no natural boundary between the edges of these quadrants: test items near the top of the bottom-right quadrant, for example, are barely different from

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[5]While at first glance it seems that there are three groups defined by the three quadrants that contain data, upon further reflection, we can justify conflating the top-left and bottom-right quadrants. These two quadrants share the feature of having one aspect that is rated highly by most participants vs. the opposite aspect that is dispreferred by most participants. The only difference between the two is that in the bottom-right quadrant our participants agreed with the author of the original text, rating his / her choice also as the only one that is highly preferred, whereas in the top-left quadrant the majority of participants disagreed with the author of the original text. If we regard the author's choice as just one rating among many, then the top-left and the bottom-right belong to the same group, namely the group of test items for which the choice of aspect is more or less categorical. However, since only 2% of the data appears in the top-left quadrant and most of that data is not strongly categorical, we leave those contexts aside in the remainder of this study.

test items at the bottom of the top-right quadrant. Furthermore, these two groupings have very different proportions of data in them, since 83% of the data is in the bottom-right (81%) or top-left (2%), with only 17% in the top-right, so the samples are of very different sizes. Both of these problems can be mitigated by taking a subset of the data that is in the extreme corner of the bottom-right quadrant. We therefore define a 'mini-quadrant' of the bottom-right (see the small box in Fig. 1) as those test pairs for which the original token received an average of 1.90–2.00 (i.e., the highest scores), and the non-original token received an average of 0.00–0.10 (i.e., the lowest scores). This mini-quadrant contains the 173 paired test items that received almost unanimous categorical ratings of 'excellent' for the original aspect vs. 'impossible' for the non-original aspect. This mini-quadrant subset of the data is clearly very distinct from the top-right quadrant in terms of ratings, and also of a similar size, since the top-right quadrant contains 114 paired test items. Taken together, the top-right quadrant and the mini-quadrant contain 287 paired test items, or 43% of the total dataset.

By comparing the mini-quadrant of the bottom-right quadrant with the top-right quadrant, we obtain data that has been objectively normed by native speakers of Russian, showing that these items maximally distinguish between contexts in which the choice of aspect is categorical (the mini-quadrant) and those in which both aspects are possible (the top-right quadrant). This is the data that our analysis focuses on in an attempt to identify systematic differences between categorical and overlapping contexts.
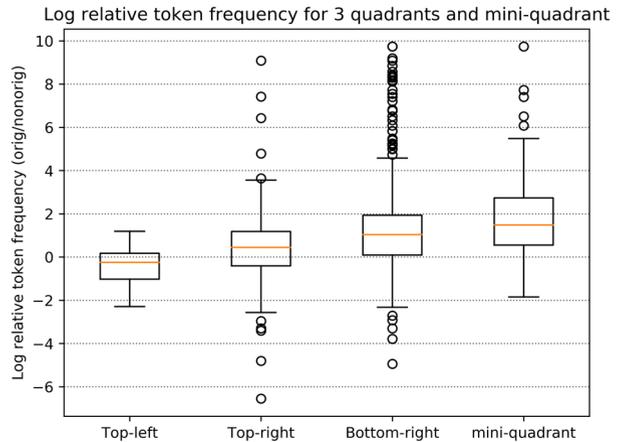
2.4 Frequency

Before moving on to a detailed analysis of the contexts represented in the top-right quadrant and the mini-quadrant, it is important to consider the possible effects of frequency. It is well-known that frequency plays a role in many linguistic phenomena. If it is the case that the participants in the experiment were merely consistently giving a higher rating to the aspectual form with the higher frequency, the contexts would be of less interest. It is also important to establish that the two subsets of the data that we will focus on are indeed significantly different from each other and therefore distinct.

The previous analysis of our data presented in Sect. 2.2 showed that the relative corpus frequency of the original form vs. the one of the opposite aspect had only a small effect in the dataset overall. However, we need also to see whether this small effect is distributed differently across the dataset, in particular in relation to the two subsets that our subsequent analysis focuses on, namely the top-right quadrant and the mini-quadrant.

The frequencies of the original and non-original verb forms are measured based on data from the Russian National Corpus (ruscorpora.ru) and can be compared to each other as an odds ratio. However, by themselves, odds ratios are a problematic measurement since their range is from one to infinity when the numerator is larger than the denominator, but only between zero and one when the numerator is smaller than the denominator. It is customary to use the natural logarithm of corpus data in order to correct for the natural skewing of word frequencies ('Zipf's Law'). When we take the logarithm of an odds ratio, the result is called a 'logit' and this is a convenient metric since it converts the two ranges of the odds ratios into a symmetrical distribution centered around zero (the value of the logit that obtains when the frequencies of both items are the same). For example, an odds ratio of 1000/1 (relative frequency where one item appears 1000 times and the other only once) = 1000 yields a logit of 6.9, and the reverse relative frequency of $1/1000 = 0.001$ yields a logit of −6.9. Figure 2 shows the distribution of the logits for relative frequency across the three quadrants containing data in Fig. 1, plus the mini-quadrant which is a subset of the bottom-right quadrant. The following scale can help to interpret Fig. 2, with positive logit values and

Fig. 2 Distribution of relative frequency of original vs. non-original (opposite aspect) forms across the three quadrants of Fig. 1, plus the mini-quadrant, measured as the natural logarithm of the ratio of corpus frequencies

relative frequencies: logit 1 = original is 2.7 times more frequent, logit 2 = original is 7.4 times more frequent, logit 3 = original is 20.1 times more frequent, logit 4 = original is 54.6 times more frequent, logit 5 = original is 148.4 times more frequent, logit 6 = original is 400.4 times more frequent, logit 7 = original is 1096.6 times more frequent, logit 8 = original is 2981 times more frequent, logit 9 = original is 8103.1 times more frequent, logit 10 = original is 22026.5 times more frequent. Negative values reflect the opposite proportions, in which the non-original form is more frequent than the original form.

Figure 2 visualizes the distribution for each quadrant and the mini-quadrant in terms of box-and-whiskers plots, with the median indicated by an orange line, the box showing the interquartile range (the placement of the middle 50% of the data), whiskers extending to 1.5 times the interquartile range, and circles representing individual outliers that fall beyond the whiskers.

The distributions of all four boxplots straddle zero on the logit scale (where the frequencies of the two aspectual forms are the same). The top-left quadrant contains very little of the data and will not be discussed further. The medians of the top-right, bottom-right and mini-quadrant are all above zero, indicating an overall preference for the form that is of higher frequency. We perform a t-test to compare the distributions in the two subsets of data that our further analysis is focused on, namely the top-right and the mini-quadrant. This test reveals a statistically significant difference (p-value = 0.00001) in the distribution of log relative frequency with a robust effect size (Cohen's $d = |0.6|$).[6] In other words, the top-right and mini-quadrant are statistically different from each other. The mini-quadrant contains significantly more aspectual pairs in which the frequency of the original form is higher than the frequency of the non-original form. The mini-quadrant distribution is mostly one-sided and does not include any data for test pairs in which the non-original form was more than 2.7 times more frequent than the original form (i.e., no logits below −2). By contrast, the distribution of the top-right quadrant is the most balanced, with outliers in both directions, whereas the mini-quadrant has outliers only in the positive direction.

[6]Cohen's $d = |0.6|$ is interpreted as a medium-large effect size, and it means that although 76% of the two groups overlap, 73% of the items in the mini-quadrant lie above the mean for the top-right quadrant, and there is a 66% chance that an item taken at random from the mini-quadrant will have a value higher than that of an item taken at random from the top-right quadrant. For interpretation of Cohen's d, see https://rpsychologist.com/d3/cohend/.

The analysis of frequency tells us that the experiment tested the acceptability of original aspectual forms that were both of higher and of lower frequency than the corresponding non-original aspectual forms, and that both types are found in all parts of the distribution in Fig. 1. Although there is some preference for the higher-frequency forms, this preference has more chance to be expressed in the mini-quadrant, which contained more verbs with a frequency imbalance favoring the original form. The mini-quadrant and the top-right quadrant are significantly different from each other: the frequency balance among original vs. non-original forms is closer to zero in the top-right quadrant. In sum, frequency is not a deciding factor, though there is an overall trend to use some forms more frequently than others.

3 Analysis of categorical vs. overlapping contexts for aspect

In this section we undertake a qualitative analysis of the specific contexts that emerged as categorical contexts vs. overlapping contexts on the basis of the data from our experiment. We compare our findings to expectations based on previous scholarship. We focus especially on the overlapping contexts in Sect. 3.2, in which we find confirmation for traditional descriptions of *konkurencija vidov* 'aspectual rivalry', along with additional factors conditioning such rivalry.

3.1 Categorical contexts for aspect: aspectual antonymy

The mini-quadrant described in Sect. 2.3 above contains all examples for which both of the following statements are true: 1) 90% or more of respondents rated the original aspect as 'excellent', and 2) 90% or more of respondents rated the non-original aspect as 'impossible'. These are the contexts for which there was the strongest agreement across participants that one and only one aspect was acceptable for each test pair. There are 173 test pairs in the mini-quadrant, comprising 25.7% of the total dataset from the experiment. Of these, 95 involve a perfective as the original form and 78 involve an original imperfective form.

Because the experiment described in Sect. 2 collected ratings only of verbal forms for which both aspects are possible, namely the infinitive, past, future, and imperative, no non-past forms were rated. This means that contexts of aspectual neutralization could not be included in the experiment since both the historical present and the stage present require imperfective non-past forms. For this reason, the description of data in this section is restricted to contexts of aspectual antonymy. All examples cited in Sect. 3.1 come from the mini-quadrant. Examples are cited with the pairs of verb forms that were rated by participants presented in square brackets with the perfective form listed first, followed by a slash, and then the imperfective form. The status of each form as 'original' or 'non-original' is also given in superscript. The corresponding verb in the English translation is written in italics.

The bulk of the test pairs in the mini-quadrant illustrate exactly the contexts we expect: the presence of adverbial cues and constructions or fixed expressions that strongly or exclusively prefer one aspect over the other. The following two examples show categorical contexts that contain adverbial cues: in the first example, *v rezul'tate* 'as a result' is strongly associated with perfectives, and in the second example, *často* 'often' is strongly associated with imperfectives. Other cues that trigger the perfective in the mini-quadrant include *nakonec-to* 'finally', *nepremenno* 'without fail', and *ostalos'* 'there remained (to do)'; and ones that trigger imperfective include *vsegda* 'always', *každyj den'* 'every day', and preceding phasal verbs like *stat'* 'begin to'.

(5) a. Perfective cue: *v rezul'tate* 'as a result'
Nu tak on kričal-kričal, begal-begal, i v resul'tate [[original]*zamerz* /
[non-original]*zamerzal*].   (Ist)[7]
'So he kept yelling and running around, and as a result he *froze*.'
  b. Imperfective cue: *často* 'often'
Za bol'šim stolom na terrase často [[non-original]*sobralis'* / [original]*sobiralis'*] gosti.
(BZh)
'Guests often *gathered* at the big table on the terrace.'

However, most test items in the mini-quadrant are not associated with any known cue for aspect, a fact that is consistent with the findings of Reynolds (2016) discussed in Sect. 1.3. There are inevitably other factors at play. The following two examples from the mini-quadrant illustrate a construction that prefers a perfective verb and a construction that prefers an imperfective verb, respectively.

(6) a. Construction preferring a perfective: *vremja* NP[gen] *prošlo* 'the time for NP has passed'
[. . .] tysjači i tysjači amerikanskix neftedobyvajuščix kompanij [. . .] prodemon-strirovali, čto vremja neftjanyx zagovorščikov i manipuljatorov [[original]*prošlo* /
[non-original]*proxodilo*].   (NS)
'[. . .] thousands and thousands of American oil-producing companies [. . .] have demonstrated that the time for oil conspirators and manipulators *has passed*.'
  b. Construction preferring an imperfective: subject + infinitive + *ne* + finite non-past
Ja [[non-original]*pospešit'* / [original]*spešit'*] zdorovo ne spešu.   (ID)
'I'm not in any hurry.' (Lit. I *to hurry* really not hurry.)

In the first construction above (6a), only the perfective *prošlo* 'passed' was judged accept-able; the corresponding imperfective *proxodilo* was rejected by our participants. The second construction (6b) reduplicates an imperfective verb and here allows only the imperfective infinitive *spešit'* 'hurry' to precede the finite non-past form (also imperfective). Other con-structions with strong aspectual preferences that we observe in the mini-quadrant include for the perfective: *čto stanet s* NP[ins] 'what will happen with NP' (where *budet stanovit'sja* is excluded), *net-net da i* V[pfv] 'V-ing every now and then'; and, for the imperfective: infinitives following finite forms of both *učit'sja* and *naučit'sja* 'learn (how to)'.

Constructions contain slots that allow various fillers. By contrast, fixed expressions allow no internal variation, as illustrated by the following pair of examples.

(7) a. Fixed expression with a perfective verb: *predstav'te sebe* 'just imagine'
[. . .] vot [[original]*predstav'te* / [non-original]*predstavljajte*] sebe, vot na devjatoe maja bylo dvesti šest' čelovek.   (ID)
'[. . .] just *imagine*, on May 9th there were 206 people.'
  b. Fixed expression with an imperfective verb: *ešče kuda ni šlo* 'that was bad enough'
Otdavat' čast' svoix rynočnyx niš amerikancam ešče kuda ni [[non-original]*pošlo* /
[original]*šlo*], no videt', kak vmesto saudovskoj nefti pokupajut neft' iranskuju, dlja Ėr-Rijada bylo vyše vsjakix sil.   (NS)
'Giving away some of their market niches to the Americans, that *was bad enough*, but seeing people buying Iranian oil instead of Saudi oil, that was more than the Er-Rijad could bear.'

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[7]The text each example comes from is indicated by an abbreviation cited in Table 1.

Other fixed expressions found in the mini-quadrant of categorical contexts include: *nu, do-pustim* (not *budem dopuskat'*) 'well, let's assume'; *stoit otmetit'* (not *otmečat'*), *čto* 'it is worth mentioning that'; *kak i sledovalo* (not *posledovalo*) *ožidat'* 'as one would expect'.

Another feature of the mini-quadrant is the presence of chains of conjoined verbs in which the tendency is to have either a series of perfective verbs designating a sequence of events, as in the first example below, or a set of simultaneous situations marked by imperfective verbs, as in the second example.

(8) a. Perfective conjoined verbs marking a sequence of events
Nu v obščem [[original]*doexali* / [non-original]*doezžali*] my do Xalenzee, i [[original]*vyšli* / [non-original]*vyxodili*] tam.
'Well, in the end we *rode* to Halensee and *got off* there.'   (Ist)

b. Imperfective conjoined verbs marking simultaneous situations
Dar'ja sidela na beregu reki v teni pribrežnyx derev'ev i [[non-original]*sšila* / [original]*šila*], a Vasilij s vnukami [[non-original]*postroil* / [original]*stroil*] zamki iz peska.   (BZh)
'Dar'ja sat in the shade of the trees on the river bank and *sewed*, and Vasilij *built* sand-castles with the grandchildren.'

Additionally there are some verb pairs for which one form is simply much more frequent than the other, and in these pairs frequency may have a local effect of bolstering the categorical ratings. The outliers with the most extreme differences in the mini-quadrant involve pairs in which the perfective future form is very common and the imperfective future is very infrequent, such as *stanet* (as opposed to *budet stanovit'sja*) 'become' and *nastupit* (as opposed to *budet nastupat'*) 'will ensue'. However, other verb forms also show marked differences in frequency, such as the past tense forms in the next pair of examples.

Some verbs show the effect of frequency associated with the mini-quadrant quite strongly, and often this association is motivated by the semantics of verbs. Making a decision is a change of state, and *rešili*[pfv] '(they) decided' is more common than the corresponding *rešali*[ipfv] (log relative frequency = 2.96). Conversely, being afraid is a state, and *bojalsja*[ipfv] 'was afraid' is more common than *pobojalsja*[pfv] (log relative frequency = 2.57). Examples of these two verb pairs follow.

(9) a. Higher frequency for the perfective
I my [[original]*rešili* / [non-original]*rešali*] tože tak dejstvovat' [. . .].
'And we *decided* to do the same.'   (Ist)

b. Higher frequency for the imperfective
Vasilij paničeski [[non-original]*pobojalsja* / [original]*bojalsja*] diskreditirovat' sebja v glazax soratnikov po partii.   (BZh)
'Vasilij *was panic-stricken* that he might discredit himself in the eyes of his party comrades.'

It is certainly the case that there can be more than one factor motivating a categorical context, for example that constructions and fixed expressions are also associated with higher frequent aspectual forms, which is likely often an effect of semantics. This analysis merely picks out some of the most typical contexts in the mini-quadrant.

3.2 Overlapping contexts for aspect

The top-right quadrant described in Sect. 2.3 contains all examples for which both of the following statements are true: 1) The majority of respondents rated the original aspect as 'excellent' or 'acceptable'; and 2) the majority of respondents rated the non-original aspect

as 'excellent' or 'acceptable'. In other words, these are the contexts in which both aspects received favorable ratings, although it is also the case that the original aspect often received even higher average ratings than the non-original aspect. There are 114 test pairs in the top-right quadrant, comprising 16.9% of the total dataset from the experiment. Of these, 71 involve a perfective as the original form and 43 involve an original imperfective form.

This section is an analysis of the overlapping contexts that landed in the top-right quadrant based on the ratings of participants in our experiment. In the first part of the analysis we follow the classification of overlapping contexts suggested by previous scholars, showing confirmation for those insights. In the second part of the analysis we turn to test items from the top-right quadrant that suggest additional factors that contribute to the relatively free choice of aspect in overlapping contexts. All examples cited in Sect. 3.2 come from the top-right quadrant.

3.2.1 Overlapping contexts predictable from previous scholarship

Previous scholarship reviewed in Sect. 1.2 suggests that we should expect to find both aspects acceptable in contexts describing bounded durations, repeated events, and potential events, in addition to transitional contexts such as intentions in the proximate future and general-factual vs. specific-factual uses. These types are found in our data with two exceptions: the potential event type and the proximate future type. The potential event type requires a future verb form, and these were relatively rare in our data, with only 57 test pairs (8.5% of the total), none of which happened to illustrate that particular meaning. The proximate future type is an overlap across different tenses, future and present, with non-past forms of both the perfective and the imperfective. Since all grammatical categories other than aspect (tense, mood, finiteness, person, number, gender) were held constant in our test pairs in order to isolate aspect from other factors, alternatives of this type were not represented in our experiment.

3.2.2 Bounded durations

Test pairs containing both delimitative (with the prefix *po-*) and perdurative (with the prefix *pro-*) perfectives are found in the top-right quadrant, as evidenced in the following two examples, both of which also explicitly state the length of the duration.

(10) a. Bounded duration with original delimitative perfective, simplex imperfective acceptable

Prosto udivil tot fakt, čto ėtot čelověk brosil vse i prosto vzjal, i potratil ves' svoj den', obrazno govorja s 10 do 12 na drugogo, neznakomogo čeloveka, kotoromu prosto stalo ploxo, on vyzval skoruju, [original*postojal* / non-original*stojal*], podoždal.

(MGLU)[8]

'It was just surprising the fact that that person dropped everything and just went and spent his whole day, namely from 10 to 12 on another person, a stranger, who just got sick, he called an ambulance, *stood* there and waited.'

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[8]The acceptability of the imperfective *stojal* 'stood' is likely enhanced when participants give positive ratings for the imperfective alternatives for other verbs in the sentence as well. In other words, *stojal* 'stood' looks better when 'excellent' or 'acceptable' ratings are given to these underlined imperfectives: ...*kotoromu prosto stanovilos' ploxo, on vyzyval skoruju*, [original*postojal* / non-original*stojal*], *ždal*. Participants rated both perfective and imperfective options for all verbs where both were morphologically possible. All of these choices are not represented in citations of the examples in this article in order to improve readability. The presence of chains of verbs is a fact of authentic Russian that was included in our experiment. However, the specific influence of these chains on the rating of aspectual forms is a topic for further research and as such goes beyond the scope of the present article.

   b. Bounded duration with original simplex imperfective, perdurative perfective acceptable

     Ja pomnju, čto ėta ėpopeja [[non-original]*prodlilas'* / [original]*dlilas'*] bol'še, čem odin mesjac, daže gde-to dva. (MGLU)

     'I remember that this saga *lasted* longer than a month, maybe even two.'

3.2.3 Repeated events

Descriptions of similar events that can be seen either summed up as a whole or viewed as a series of repetitions are common in the top-right quadrant. The first two examples below come from a popular science article about a complex set of experiments repeated on successive generations of populations of bacteriophages. The third example narrates encounters with passengers on public transport who put a number of questions to some drunken students.

(11) a. Repeated event with original perfective, imperfective acceptable

     Bakterii s otključennoj sistemoj CRISPR tože [[original]*vyrabotali* / [non-original]*vyrabatyvali*] koe-kakuju zaščitu [. . .]. (UV)

     'The bacteria that had their CRISPR system shut off also *developed* some kind of protection.'

    b. Repeated event with original imperfective, perfective acceptable

     Ėti populjacii zatem [[non-original]*podverglis'* / [original]*podvergalis'*] zaraženiju virusami. (UV)

     'These populations *were* subsequently *subjected* to infection by viruses.'

    c. Repeated event with original imperfective, perfective acceptable

     [[non-original]*Sprosili* / [original]*Sprašivali*] u nas, otkuda my, vot, čego my tut delaem, kak voobšče my dogovorilis' vse vmeste v takom sostave tut vstretit'sja [. . .]. (Ist)

     'They *asked* us where we were from, what we are doing here, and how we had all agreed to meet up on this train.'

Remarkably, the context of repeated events appears to be sufficiently strong to override even a very strong cue for the perfective aspect, namely the *za* + time expression, as in *za troe sutok* 'in three days' in the following example. The perfective is the original aspect in this text and receives somewhat higher ratings than the imperfective, but the imperfective was rated as 'excellent' or 'acceptable' by most participants.

(12) Repeated event with original perfective, imperfective acceptable with *za* + time

     [. . .] bakterii iz smešannyx kul'tur za troe sutok ne [[original]*priobreli* / [non-original]*priobretali*] novyx protivovirusnyx spejserov [. . .]. (UV)

     '[. . .] the bacteria from mixed cultures did not *acquire* new anti-viral spacers in the course of three days [. . .].'

In addition, there seem to be certain verbs that have a tendency to occur in contexts in which they can be interpreted either as single summed actions or repeated ones, such as *udivit'sja* / *udivljat'sja* 'be surprised' and *povezti* / *vezti* 'be lucky', as we see in these examples in which the original perfective emphasizes a summed or specific instance, but the imperfective is also acceptable when emphasizing repeated experiences.

(13) a. Perfective original emphasizing summed or specific instance, imperfective acceptable

     [. . .] oni graždane Italii, bol'šinstvo iz nix znalo imenno nemeckij, a ne anglijskij, čto menja očen' [[original]*udivilo* / [non-original]*udivljalo*]. (MGLU)

'[. . .] they are Italian citizens, most of them knew German, but not English, which really *surprised* me.'

b. Perfective original emphasizing summed or specific instance, imperfective acceptable

A ranenija ne bylo u vas? [original*Povezlo* / non-original*Vezlo*] vam? (ID)

'But you weren't wounded? You *were lucky*?'

3.2.4 Transitional type: specific-factual perfective vs. general-factual imperfective

Contexts in which a perfective conveys a specific-factual meaning while an imperfective conveys a general-factual meaning are also common in the top-right quadrant. The first two examples here illustrate contexts in which the original writer / speaker used an imperfective in the general-factual meaning, but our participants readily accepted the perfective as well.

(14) a. Original imperfective general-factual from a text, perfective specific-factual acceptable

Učastniki neftjanogo sammita v Doxe, v kotorom [non-original*prinjala* /

original*prinimala*] učastie i Rossija, ne smogli dogovorit'sja zamorozit' xotja by sutočnye ob"emy dobyči nefti, čtoby povysit' ee cenu. (NS)

'Participants of the petroleum summit in Doha, which Russia also *took* part in, couldn't agree to freeze the amount of crude oil produced daily in order to increase its price.'

b. Original imperfective general-factual from an interview, perfective specific-factual acceptable

Čto tam [non-original*proizošlo* / original*proisxodilo*]? Vot vy byli očevidcem. (ID)

'What *happened* there? You were an eye-witness.'

The option of interpreting a context in terms of the general-factual meaning is apparently strong enough to trump the influence of a strong trigger for the perfective aspect, namely *uže* 'already' in this example from a spoken narrative, in which participants approved of the imperfective alongside the original perfective.

(15) Original perfective specific-factual from a narrative, imperfective general-factual acceptable with *uže* 'already'

I vot, tak vot, i posle vsex ėtix mučenij, kotorye zanjali, kak ja uže [original*skazal* /

non-original*govoril*], bol'še, čem odin mesjac [. . .]. (MGLU)

'And well, so, even after all of that suffering which had lasted, like I *said* already, more than a month [. . .].'

The examples cited above show that events that have an extended duration, repeated events, and many past events leave space for interpretations that allow for the use of both perfective and imperfective verb forms. As the next section shows, there are additional factors that can make room for variation in the subjective perception of events.

3.2.5 Additional overlapping contexts that emerge from our data

Our data in the top-right quadrant contains additional contexts in which participants readily accepted both perfective and imperfective verb forms. This data reveals an overall pattern of what could be termed 'modality' in a broad sense of the word, including modal verbs, adverbs, and adjectives, as well as constructions that express an attitude toward a situation.

Overlapping contexts are also found in association with the imperative mood, which likewise expresses subjective evaluation of events that have not (yet) been realized.

The modal verbs *moč'* 'be able' and *umet'* 'know how to' condition an overlapping context for the verbs that they combine with, as we see in these examples in which a perfective focuses on the completion of an event, while the imperfective focuses on a process, as in the first example below, or a capacity for repetition, as in the second example.

(16) a. Modal *moč'* 'be able' + original imperfective infinitive, perfective infinitive acceptable
[. . .] ja nabljudal za vsem ėtim neposredstvenno v neposredstvennoj blizosti i vse mog ėto [non-original*uvidet'* / original*videt'*].   (MGLU)
'[. . .] I watched all this directly in close proximity and I could *see* all of it.'
b. Modal *umet'* 'know how to' + original perfective infinitive, imperfective infinitive acceptable
Vasilij umel [original*stat'* / non-original*stanovit'sja*] dlja načal'nika neobxodimym.
(BZh)
'Vasilij knew how to *make himself* indispensable to his boss.'

Impersonal constructions with modal meaning are common as well, and these include both subjectless verbs, as in the first two examples below, and modal adverbs like *nužno*, *nado* 'necessary', illustrated in the second pair of examples. In all four examples, like the two immediately above, the original infinitive verb that is collocated with the modal expression happens to be a perfective, but the corresponding imperfective infinitive was also rated as 'excellent' or 'acceptable' by a majority of participants.

(17) a. Modal *udat'sja* 'succeed' + original perfective infinitive, imperfective infinitive acceptable
Emu udalos' [original*najti* / non-original*naxodit'*] pokrovitelej, kotorym nužny byli svoi ljudi v komande [. . .].   (BZh)
'He managed *to find* protectors who needed to have their own people on the team [. . .].'
b. Modal *prijtis'* 'have to' + original perfective infinitive, imperfective infinitive acceptable
Tak čto ne k čemu bylo daže pridrat'sja i prišlos' [original*zaplatit'* / non-original*platit'*].
(MGLU)
'So there was no way around it and it was necessary *to pay*.'

(18) a. Modal *nužno* 'necessary' + original perfective infinitive, imperfective infinitive acceptable
[. . .] mesto, gde nužno [original*ob"exat'* / non-original*ob"ezžat'*],—obyčno otmečaet-sja ėtim konusom.   (Ist)
'the place where it is necessary *to drive around* is usually marked with this cone.'
b. Modal *nado* 'necessary' + original perfective infinitive, imperfective infinitive acceptable
Takuju armiju [original*okružit'* / non-original*okružat'*] nado.   (ID)
'It is necessary *to surround* such an army.'

The capability to carry out an action can also be expressed by other means, such as the adjective *sposobnyj* 'capable of' and the construction *u* + Genitive + *byt' redkij dar* 'have an unusual gift for', both of which combine with both perfective and imperfective infinitive forms, as in the following two examples. In the third example the speaker hedges on the

probability of what was included in a plan using the parenthetical expression *možet byt'* 'maybe'.

(19) a. Adjective *sposobnyj* 'capable of' + original imperfective infinitive, perfective infinitive acceptable

Odnako virusy, postojanno mutiruja, sposobny bystro (inogda menee, čem za sutki) [[non-original]*preodolet'* / [original]*preodolevat'*] immunitet ljuboj otdel'no vzjatoj žertvy. (UV)

'However, viruses, which are constantly mutating, are capable of quickly (sometimes in less than one day) *overcoming* the immune system of any individual victim.'

b. Construction *u* + NP[gen] + *byt' redkij dar* 'have an unusual gift for' + original perfective infinitive, imperfective infinitive acceptable

U nego byl redkij dar v nužnyj moment [[original]*okazat'sja* / [non-original]*okazyvat'sja*] na glazax u načal'nika ili nezametno [[original]*uskol'znut'* / [non-original]*uskol'zat'*]. (BZh)

'He had an unusual gift for *appearing* before his boss or *slipping away* unnoticed at just the right time.'

c. *Možet byt'* 'maybe' + original perfective past, imperfective past acceptable

Stalin, možet byt' i ne [[original]*učel* / [non-original]*učityval*] ėto vse delo [...]. (ID)

'Maybe Stalin didn't *take* the whole issue *into account* [...].'

The mini-quadrant contains only four imperative forms, three of which involve constructions with fixed aspect, such as *predstav'te sebe* 'just imagine' discussed above in Sect. 3.1. By contrast, there are twice as many imperative forms in the top-right quadrant as we would expect given their frequency in the overall dataset. This suggests that imperative mood is associated with relative freedom for the speaker to use aspect to add nuance. In the following pair of examples, the perfective is relatively more forceful or unexpected as opposed to the imperfective, which can be used when the message is one that is expected or, in the case of negation, a blanket prohibition. However, both aspects are rated acceptable by our participants.

(20) a. Original perfective imperative, imperfective acceptable

Nas ne [[original]*tron'* / [non-original]*trogaj*] [...]. (ID)

'Don't *touch* us [...].'

b. Original imperfective imperative, perfective acceptable

Nu, [[non-original]*skaži* / [original]*govori*]. (MGLU)

'Well, *tell* (me).'

These findings square well with Forsyth's (1970, p. 205) reports that a portion of imperfective imperatives in Russian clearly denote single actions and that both perfective and imperfective infinitives are found after verbs expressing volition (ibid., p. 232), capacity (p. 237), and permissibility (p. 239).

3.2.6 Summary of overlapping contexts

We have found confirmation for overlapping contexts involving bounded events, repeated events, and the interpretation of specific-factual vs. general-factual, all of which are suggested by Maslov (2004[1948]). In addition, we also found a variety of expressions of modality. While there is previous scholarship (e.g., Padučeva 1996; Šmelev and Zaliznjak 2006) that addresses the use of the perfective vs. imperfective in such contexts, it is focused on the

meaning differences conveyed by aspect rather than on the fact that there are contexts in which both aspects are acceptable. Thus, our finding that these are overlapping contexts is both new and coherent with previous work. It also makes good sense since modality is a means of expressing a speaker's subjective interpretation of a situation, which can vary, opening the door for overlapping contexts.

In the examples presented in (16)–(19) we see a consistent formal pattern, in that there is a modal expression combined with an infinitive, and it is the infinitive form that allows for both aspects. Šmelev and Zaliznjak[9] discussed the aspectual difference in infinitives in modal constructions in terms of alethic modality expressed by the perfective, referring to physical necessity or possibility, as opposed to deontic modality expressed by the imperfective, referring to social or moral desirability. According to Šmelev and Zaliznjak, this is a matter of controllability: perfectives are used in contexts in which the event is out of the subject's control, whereas imperfectives are used when the subject is in control. However, this explanation would suggest that the context (physical and uncontrolled vs. social/moral and controlled) would determine the aspect, leaving little room for the aspectual rivalry that emerges in our data. We find overlapping contexts both with alethic modality, as in (16a) in which the subject is physically forced to see what is happening by being in close proximity, and deontic modality, as in (16b), where the subject is clearly in very good control of his decisions. Divjak (2009), based on a quantitative study, suggests instead that the decisive factor is one of specific (for perfective) vs. generic (for imperfective), and this analysis is also supported by a second quantitative study (Janda and Lyashevskaya 2011). A specific vs. generic distinction is more consistent with our findings since it allows for interpretation by the speaker, similar to the interpretation available in the contexts for repeated events and specific-factual vs. general-factual.

The aspect of imperative forms has attracted considerable attention, particularly with regard to imperfective imperatives, which, it is claimed, can be used to signal both politeness and insistence (cf. Bondarko and Bulanin 1967, pp. 127–128; Padučeva 1996, pp. 12–17; Timberlake 2004, pp. 374–375). Šatunovskij (2002, 2009) suggests that the aspectual distinction for imperatives is actually motivated by expectations: the perfective is used when the hearer does not previously know how they should act and the speaker feels compelled to instruct them, the imperfective is used when the speaker feels confident that the hearer should know how to act. This kind of open interpretation comports well with our findings since it makes room for overlapping contexts. For example, (20a) is a rhetorical address to the Germans on the part of a WWII army veteran. In the original the speaker used the perfective, emphasizing his expectation that the enemy does not know how to act. The imperfective is also possible if one assumes that in a situation of war each side knows that the other side does not want to be attacked, and the use of the imperfective here is also supported by the negation. In (20b), the original speaker chose the imperfective, probably because the interlocutor could be assumed to know that he should speak. But the perfective is also possible if that assumption does not hold. Thus, our findings are compatible with Šatunovskij's analysis of the differences in meaning expressed by aspect.

4 Conclusions

Participants in our online experiment rated the acceptability of both perfective and imperfective verb forms in 673 contexts. Rather than yielding two groups of contexts, namely

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[9]Šmelev, A., & Zaliznjak, A. (2006). *Aspect, modality, and closely-related categories in Russian*. Paper presented at the Slavic Linguistics Society Conference at Indiana University.

categorical and overlapping, as could be expected given previous scholarship that focuses on absolute contrasts on the one hand and aspectual rivalry on the other, our ratings constitute a continuum in which no groups emerge (Fig. 1). Mathematically it is possible to separate out two subsets that are distinct from each other by taking two extremes of the continuum where ratings are nearly unanimously categorical (the mini-quadrant) vs. ratings that show that both aspects are acceptable (the top-right quadrant). These two subsets of data are statistically distinct in terms of the relative frequencies of the original vs. non-original verb forms: verbs for which the relative frequency was more strongly skewed in favor of the original form are more typical of the mini-quadrant than of the top-right quadrant. This is the first study to examine the differences between categorical and overlapping contexts strictly on the basis of emergent patterns in experimental data. Most previous scholarship relies on the introspective analysis of constructed examples.

An analysis of the categorical contexts in the mini-quadrant and the overlapping contexts in the top-right quadrant supports previous scholarship in finding cues, constructions and fixed expressions that motivate categorical contexts on the one hand, and bounded events, repeated events, and specific-factual vs. general-factual interpretations that motivate overlapping contexts on the other hand. In addition, our data highlights the possible influence of various expressions of modality in conditioning overlapping contexts.

There are several types of environments that are not within the scope of the present study, such as aspectual neutralization, and Maslov's (2004[1948]) transitional type for proximate future and 'illustrative example' meaning of aspect. It is also the case that further contexts and factors could be isolated in a more comprehensive study. And, it remains to be seen whether our findings concerning modal expressions will hold up to further investigations.

The discovery of factors that motivate categorical as opposed to overlapping contexts for Russian aspect has important implications for pedagogy, since mastery of the aspect system is perhaps the most daunting task facing an L2 learner.

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