

Russian Children's Knowledge of Aspectual Distinctions

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The grammatical aspect that a speaker uses to describe an event reflects the speaker's perspective on the event. Perfective aspect has been characterized as viewing an event from the outside, imperfective aspect as taking an internal perspective on an event. This difference in perspective may also give rise to truth-conditional differences between perfective and imperfective forms. In Russian, perfective aspect views events holistically and is used to refer to terminated or completed events (e.g. *prochitat'^p knigu* 'to read a book completely'). In contrast, imperfective aspect lacks any completion entailment and can be used to describe complete, incomplete or ongoing events (e.g. *chitat'ⁱ knigu* 'to read a book').

This study focuses on the question of what Russian 3-5 year old children know about the different completion entailments of perfective and imperfective aspect. The choice of Russian is motivated by the fact that the category of Aspect in Russian is morphologically independent of Tense to a great extent, which enables us to independently control for each of them. Whereas previous studies have suggested very early mastery of aspectual distinctions by Russian children, our studies reveal strikingly non-adultlike judgments in the area of completion entailments. We show that Russian children know that imperfectives can refer to *parts* of events, but that this does not necessarily extend to *incomplete* events.

1. Previous Research

A number of naturalistic production studies (Brun et al., 1999; Bar-Shalom & Snyder, 2001; Bar-Shalom, 2003) suggest that young Russian-acquiring children produce both aspectual forms appropriately from a very early age. Importantly, children do not seem to limit a given verb to just one of its aspectual forms: the studies cite examples of aspectual minimal pairs produced by the same child at the same age.

Vinnitskya & Wexler (2001) present a sentence-to-picture matching experiment investigating comprehension of aspect by 3-, 5- and 6.5-year old Russian-speaking children. The children's task was to match a past perfective or imperfective sentence to one of three pictures. One picture depicted the result state of a completed event (e.g., for reading: a smiling girl sitting next to a closed book); another showed the same event in progress (e.g., for reading: a girl reading a book); the remaining picture depicted an unrelated action. In each trial the child heard either a perfective or imperfective sentence ((1)a and (1)b respectively) and had to match it to one of the pictures.

- (1) a. Devochka prochitala^P knigu. b. Devochka chitala^I knigu.
 girl read.Past.Perf book girl read.Past.Perf book
The girl read the book. *The girl was reading the book.*

Results showed that children in all three age-groups showed a strong tendency to select the completed picture on perfective trials and the in-progress picture on imperfective trials. Based on this evidence, Vinnitskaya & Wexler conclude that the children show adult-like knowledge of the completion entailments of perfective and imperfective forms.¹ This replicates results of a similar study on Polish children by Weist et al. (1991). However, it should be noted that the picture matching task makes it difficult to directly test knowledge of the imperfective's lack of completion entailments. The in-progress picture represents an event that is in the present and *ongoing*, as opposed to an event that is in the past and explicitly *incomplete*. As we shall see below, these differences are important.

2. Experiment 1: Change-of-State Experiment

We next describe an experiment that uses a story-comprehension method to test whether Russian children know the completion entailments associated with grammatical aspect, focusing on the contrast between *complete* and *incomplete* past events.

Design. In a typical story that was acted out in front of the child, a toy animal went along a road with three landmarks: a flower-bed, a castle and a tree (design adapted from Wagner, 2001). A given action, that could be performed to completion at each location, was performed completely at one location only, incompletely at one other location, and not at all at a third location. For example, in the *color in a flower* story, a monkey encounters a white flower at each of the three locations. He colors the entire flower orange at the flower-bed (*complete* location); at the castle, he starts coloring in the flower, but is interrupted and therefore leaves the flower half-orange/half-white (*incomplete* location); at the tree, he notices a flower but decides not to do anything with it (*no event* location). At the incomplete location, the main event did not reach completion due to an *interruption* (e.g., snowfall), which distracted the Agent from the main event. The order of event types (completed, incomplete, no event) was randomized across and within trials. The interrupting event took place twice per story: always at the incomplete location, and at either the complete or the no-event location.²

¹ We review only Experiment 2 from Vinnitskaya & Wexler (2001), as it is the most relevant for our topic. Their Experiment 3 focuses on the pragmatics of aspect.

² Incomplete events resulted from interruptions rather than from simple failures, due to the possible infelicity of using the imperfective to describe failures. The two occurrences of the interrupting event provide an opportunity to control for a

At the end of each story the experimenter asked the child a series of questions. This always included both perfective (2) and imperfective (3) *where-* and *anywhere else-*questions about the main event, and a pair of control questions about the interrupting event (4). The order of the perfective and imperfective questions was randomized.

- (2) a. Gde obezjyanka zakrasila^P cvetok?
where monkey color-in.Past.Perf flower
Where did the monkey color in a flower?
b. A gde-nibud' esh'e obezjyanka zakrasila^P cvetok?
anywhere else monkey color-in.Past.Perf flower
Did the monkey color in a flower anywhere else?
- (3) a. Gde obezjyanka zakrashivala^I cvetok?
where monkey color-in.Past.Imp flower
Where was the monkey coloring in a flower?
b. A gde-nibud' esh'e obezjyanka zakrashivala^I cvetok?
anywhere else monkey color-in.Past.Imp flower
Was the monkey coloring in a flower anywhere else?
- (4) a. Gde obezjyanku ukusil^P zhuk?
Where was the monkey stung by a bug?
b. A gde-nibud' esh'e obezjyanku ukusil zhuk?
Was the monkey stung by a bug anywhere else?

We asked *anywhere else-*questions because adult speakers of Russian allow multiple locations in reply to the questions in (3) and (4). In the picture-turning example, an exhaustive answer to both (3)a and (4)a would be 'At the flowers and at the castle.' In order for a child to be considered as responding in an adult-like manner, he should name the complete location only for the perfective question, and respond 'no' to the *anywhere else* question. For the imperfective question and the control question he should name two locations in each case.

After the experimenter's questions, the child was also asked to judge statements made by a puppet, named 'Gosha', who was watching the story with the child. Truth-value judgments were used to reinforce and clarify the results from the *where-*questions and enable us to see how consistent children's responses are across different types of tasks.

Our subjects were 34 monolingual Russian-speaking children, ages 3–5, from Moscow, Russia. The experiment was run in one or two sessions of 15-25 minutes. Each child saw a total of four stories, preceded by a warm-up story at the beginning of each session.

Results. We present the results based on all questions asked after each story, comprising perfective and imperfective *where-*questions (in randomized order),

child's ability to hold multiple locations in memory. Thanks to Sergey Avrutin and Rozz Thornton for important suggestions on these points.

and also truth-value judgments of the puppet's statements. Analyses based only on responses to the first question look very similar.

Note that in some instances children responded to questions about the incomplete event by saying that it happened *halfway*, as in the dialogue in (5) below.³ We coded these responses according to whether they would be felicitous for adults: adults could felicitously use a *halfway* response with a perfective verb, but not with an imperfective verb.

(5) Subject: MV

<i>Location</i>	Flowers	Castle	Tree
Main event (turn over a picture)	comp	inc	none
Interruption (a butterfly flies in)	yes	yes	no

Puppet: U zamka, Koshka perevernula^P kartinku

At the castle, Cat turned over the picture

MV: **napolovinu. 4** [The child is grading the puppet on a 1-5 scale.]
halfway. 4

[.....]

Puppet: u cvetochkov, Koshechka perevernula^P kartinku

at the flowers, Cat turned over the picture

MV: pravil'no. Opyat' 5+
correct. 5+ again

Puppet: U zamka, K perevorachivala^I kartinku

At the castle, Cat was turning over the picture

MV: # **napolovinu. Opyat' 4.**
Halfway. 4 again.

In (5) MV corrects the puppet's perfective statement *At the castle, Cat turned over the picture* by saying 'Halfway'. This is a completely legitimate correction from an adult perspective. However, MV gives an identical response to the corresponding imperfective question. For an adult speaker of Russian *Ona napolovinu perevorachivala^I kartinku* 'She was turning the picture halfway' sounds distinctly odd, even ungrammatical, reflecting the lack of completion entailments in the imperfective. These responses were coded as adultlike and non-adultlike, respectively.

The results are summarized in (6). The shaded final row of the table represents the adult response pattern. Children's responses were classified based on a composite of all questions and truth-value judgments given after each story. Responses were only classified as adultlike or non-adultlike if they were consistent across *where*-questions and truth-value judgments. Responses were highly consistent: 94% of responses were consistent across *where*-questions and

³ Children used a number of different lexical items to convey that the action was carried out partially. Apart from *napolovinu* 'halfway', they also used *ne sovsem* 'not completely' and *chut'-chut'* 'a little, slightly'. We combine all of these cases under the *halfway* heading.

truth-value judgments, and the observed response patterns corresponded to only 3 of the 16 possible patterns.

(6) Change-of-state experiment results (n=34, mean age = 4;7)

Type	Response pattern	%	Details of response pattern				%
			PERF		IMP		
			comp	inc	comp	inc	
A	Adultlike PERF&IMP	38% (46/120)	✓	✗	✓	✓	38% (46/120)
B	Non-adultlike IMP with INC	47% (57/120)	✓	✗	✓	✗	38% (46/120)
			✓	halfway	✓	halfway	9% (11/120)
C	Non-adultlike PERF with INC	8% (10/120)	✓	✓	✓	✓	8% (10/120)
D	Contradictory Responses	6% 7/120					
			✓	✗ or halfway	✓	✓	

✓ - acceptance, ✗ - rejection of a form

Children gave a fully adultlike pattern of responses on 38% of trials (*Type A* responses). However, on 47% of trials children failed to associate the imperfective sentence with the incomplete event (*Type B* responses). In order to receive this classification a child had to both fail to name the incomplete location following the *where*-question, and reject the puppet's imperfective statement about the incomplete location, or give a *halfway* response (9% of trials). In all of these trials children correctly rejected the perfective with incomplete events. In 8% of all cases the child incorrectly associated the perfective with an incomplete event while accepting the imperfective at the incomplete location (*Type C* responses). The remaining 6% (7/120) were trials in which children gave contradictory responses to the *where*-question and the corresponding statement by the puppet (*Type D* responses).

The most striking finding from this experiment is the error that occurred in almost half of all trials, in which children refused to associate imperfective predicates with past incomplete events. These non-adultlike responses were not distributed randomly: most children were either consistently adultlike or consistently non-adultlike across the 4 stories that they heard. 13 children (mean age = 5;2) accounted for 83% (38/46) of the total number of adultlike (type A) trials. 16 children (mean age = 4;2) accounted for 86% (49/57) of the total number of type B trials. The remaining 5 children were hard to categorize: 4/5 children had at least two type C or D responses; the fifth child was the only child (among 34 children) who was at chance between types A and B (2/4 trials of each type A or B). The age-difference between the adultlike and the non-adultlike children suggests that the incorrect treatment of the imperfective with incomplete responses goes away with age.

Therefore, in contrast to previous studies that have suggested very early mastery of grammatical aspect in Russian children, we have found that younger Russian children have a specific problem with associating imperfective predicates with past incomplete ('conative') events. Our task now is to try to understand the scope and cause of this problem with grammatical aspect.⁴

The previous results reviewed above suggest that Russian children understand at least the contrasting perspectives on an event that are conveyed by the perfective and the imperfective. It is less clear whether they draw a truth-conditional distinction between the completion entailments of the two aspectual forms. For example, one might argue that the clear contrast between perfective and imperfective trials in Vinnitskaya & Wexler (2001) reflects children's knowledge of the perspectives conveyed by grammatical aspect. The forced choice picture-matching task does not provide an opportunity for children to explicitly reject any sentence-picture combination. Furthermore, if children in that study were selecting pictures based on truth-conditions alone, then it is perhaps surprising that they overwhelmingly matched imperfective statements to pictures of ongoing events, since the imperfective should be at least as compatible with a picture of a completed event.

Further examination of the results of our Experiment 1 lend further plausibility to the possibility that children equate the truth-conditions of the imperfective to that of the perfective. As is common in truth-value judgment tasks, we asked children to explain their responses when they either rejected a statement from the puppet or refused to name an 'incomplete' location in response to a *where*-question. The children's explanations of their own responses can provide a useful source of evidence.

Apart from clarifications in which the child explained that an event only happened *halfway* (see above), the explanations that we collected from non-adultlike children were mostly of two types. First, children accounted for their rejection of the imperfective with an incomplete event by appealing to the interrupting event, as in (7):

(7) Subject: AK

	Flowers	Castle	Tree
Main event	comp	inc	none
Interruption	no	yes	yes

Gosha: Okolo zamka obez'yanka **napolnyala**¹ stakanchik!
At the castle, the monkey was assembling a smurf

⁴ In other studies not reported here we have shown that the same problem extends to other predicate-types and other testing conditions. We have found that younger Russian children reject imperfectives with incomplete events involving creation predicates (e.g. *build a house*) and motion predicates (e.g. *go to the park*). We have also seen the same error in situations where the Agent only performs the event incompletely, and does not perform it completely at another location in the same story.

AK: # Ne pravil'no
Incorrect
 Gosha: Pochemu?
Why?
 AK: # Sneg poshel...
It started snowing

Second, children appealed to the incomplete result-state of the event, as exemplified by (8). The child pointed to the incompletely colored-in flower at the flower-bed as a reason for rejecting the puppet's imperfective statement about the same location.

(8) Subject: LM

	Flowers	Castle	Tree
Main event	inc	comp	none
Interruption	yes	no	yes

Gosha: Okolo cvetochkov, obez'yanka **zakrashivala**^I cvetochek
*At the flowers, the monkey **was coloring in** the flower*
 LM: # Net
no
 Gosha: pochemu?
Why?
 LM: # Potomu chto zdes' belo
Because here it is white

Both explanations hinge upon the incompleteness of the event and are completely inappropriate for adults as a response to an imperfective statement. However, these explanations would be entirely appropriate for adults if the verbs in boldface in (7) and (8) were perfective. This lends further credence to the possibility that children equate the truth-conditions of perfectives and imperfectives. This possibility is consistent with approaches to language learning that argue that children begin with restrictive hypotheses about the meanings of linguistic forms that they are faced with, and only broaden their semantic hypotheses when they encounter decisive positive evidence (Berwick, 1985; Wexler & Manzini, 1987; Crain et al., 1996). Furthermore, this would be consistent with a widely observed finding about children's early use of verb morphology. It has been noted for many languages that children initially restrict certain temporal/aspectual morphology to specific classes of verbs. Young English-speaking children use the past ending *-ed* primarily with telic verbs, and the progressive *-ing* primarily with atelic verbs. A number of accounts of this phenomenon differ in details (Antinucci & Miller, 1976; Bloom, Lifter, & Hafitz, 1980; Weist et al, 1991; Shirai & Anderson, 1995; Olsen & Weinberg, 1999), but all assume that children start with an oversimplified set of morphology-to-semantics relations that reflects the default state of human language. The same approach could be applied to our findings about grammatical aspect in Russian. In the past tense, there is a natural tendency to view events as completed or terminated – i.e. perfectively. The child may first

treat both perfective and imperfective past tense verbs as perfective, until he extends the set of possible meanings to include past incomplete events as well.

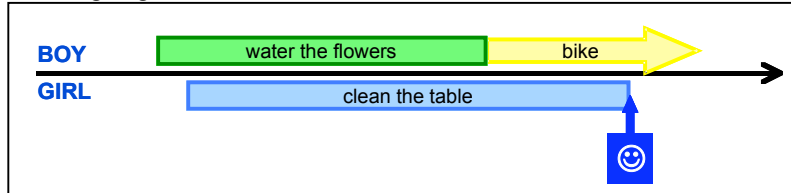
The alternative hypothesis is that Russian children do indeed know that there is a truth-condition difference between perfective and imperfective aspect, but that this is somehow masked in tasks involving conative (i.e. past incomplete) events. Experiment 2 was designed to distinguish these alternatives.

3. Experiment 2: Ongoing-Success Experiment

Design. Our second experiment was a Truth Value Judgment Task (Crain & McKee, 1985; Crain & Thornton, 1998). We tested the truth-values of the sentences (10) and (11) that differ only in the aspect of the main verb in the situation diagrammed in (9), that we will refer to as *the Ongoing-success situation*. The study uses frame-of-reference information to test children's ability to associate an imperfective predicate with a part of an ongoing event, in a situation where the relevant event does eventually reach a successful culmination.

For Russian-speaking adults, only the imperfective sentence (10) is true in the Ongoing-success situation, whereas the perfective (11) is false. Thus, if children perform in an adult-like fashion by rejecting the perfective (11) and accepting the imperfective (10), we can be confident that they associate the two aspectual forms with truth-conditional differences.

(9) Ongoing-success situation



[A boy starts watering the flowers and soon after that a girl starts cleaning the table. After a while, the boy finishes watering the flowers and starts biking, and while he is biking, the girl finishes cleaning the table.]

Adult response

- (10) Poka malchik polival^I cvety, devochka **vytirala^I** stol.
while boy water.Past.Imp flowers girl clean.Past.Imp table **Yes**
*While the boy was watering flowers, the girl **was cleaning** the table.*
- (11) Poka malchik polival^I cvety, devochka **vyterla^P** stol.
while boy water.Past.Imp flowers girl clean.Past.Perf table **No**
*While the boy was watering flowers, the girl **cleaned** the table.*

The child and the puppet Gosha watched stories acted out by an experimenter. At the end of each story, Gosha told the child something that he

remembered from the story. The child's task was to judge whether Gosha remembered it correctly. A sample story is given below.

Table-cleaning story

A girl and a boy return home from a walk. They have a few things to do about the house, including watering flowers, arranging toys and cleaning a table.

Boy: *Let me start with the flowers. It hasn't rained in such a long time, so I'll have to water them really thoroughly, otherwise they will die.* He goes to the garden, takes a watering can and starts to water the flowers.

Girl: *OK, and I will surprise my brother, then. I will take care of everything in the room – that is our toys and the table. I'll start with the toys. Oops, but we left the toy box in the park. Too bad, but I cannot do anything then. OK, let me wipe the table then. Look it's all dirty. I am going to make the table shine, so that there is not a single dirty spot left! Let me start from this corner.* The girl starts wiping the table with a cloth. *I am doing really well. My brother will come back from the garden and he'll be surprised at how shiny the table looks!*

A dog runs into the room and starts to bark.

Dog: *Woof-woof, please, give me some water. I am very thirsty.*

Girl: *Bobik, I don't have time. Look, I am busy with the table.*

Dog: *Please, give me some water! I usually drink from a pool in the garden, but it has not rained in such a long time, all of the pools have dried up!*

Girl: *Bobik, you always come at the wrong moment! OK, I'll get some water for you.*

The girl runs away and returns with a jar full of water.

Girl: *Here you are, Bobik. And now I have to get back to work.*

The girl resumes cleaning the table. After a while, the boy finishes watering the flowers and enters the room.

Boy: *Look at this table: half of it is still dirty but the other half is so shiny!*

Girl: *I am sorry, I thought I would have enough time to make it all clean before you came back, but Bobik interrupted me.*

Boy: *Don't worry! I am going to go and ride my bike now.*

The boy starts biking. The girl finishes cleaning the table.

Girl: *Look how shiny the table is!*

Boy: *Yes, indeed!*

Gosha: That was a story about a girl and a boy, and how they did some things about the house. I know one thing that happened:

*While the boy was watering flowers, the girl **was cleaning^I** the table.*

or

*While the boy was watering flowers, the girl **cleaned^P** the table.*

Subjects were 12 children from the Moscow area, ages 3-5 (mean age 4;9). All of them were among the 34 subjects who previously participated in the Experiment 1, which allows us to directly compare results across the two

experiments within subjects.⁵ Each child was tested on four trials, except one child who was tested on 3 trials, and 2 children who were tested on 2 trials (due to time limitation or illness).

Results. The results are summarized in (12), based on responses to the first query.

- (12) Ongoing-Success Experiment results, first-queries
(n=12, mean age = 4;9)

Tested Sentence	% Yes	Adult response
Imperfective	100% (19/19)	Yes
Perfective	20% (4/20)	No

Thus, children accepted the imperfective (10) in 100% of cases, but they accepted the perfective (11) only in 20% of cases. The high percentage of correct yes-responses to the imperfective sentences and no-responses to the perfective sentences indicates that children are aware of the truth-conditional differences between the two aspectual forms in this context.⁶

As in Experiment 1, we can gain a fuller picture of children's knowledge by classifying children's responses based on responses to both the perfective and the imperfective statements in each trial, as shown in (13).

- (13) Ongoing-Success Experiment results, both queries
(n=12, mean age = 4;9).

Response pattern	%
Reject Perf. & Accept Imp.	81% (30/37)
*Accept Perf. & Accept Imp.	16% (6/37)
Reject Perf. & *Reject Imp.	3% (1/37)

In 81% of trials the child correctly answered 'Yes' with the imperfective statement and 'No' with the perfective statement within the same trial. Children always adequately explained their rejection of the perfective. Notice that in this experiment children rejected the imperfective statement in only 3% of trials.

All 12 children in this experiment also participated in Experiment 1. 5 of the 12 children fell into the non-adultlike group in Experiment 1 and are, therefore, of most interest to us. These 5 children gave an adultlike response pattern in only 12% of trials in Experiment 1, but gave almost exclusively adultlike responses (89%) in Experiment 2 (the difference in performance is

⁵ For each subject there usually was a one-week interval between the Change-of-State and the Ongoing-Success studies.

⁶ The better performance with imperfectives than with perfectives is not surprising given that the correct answer is 'Yes' to the imperfective sentence in (10), and 'No' to the perfective (11). Children's natural bias towards 'Yes' answers (Crain & Thornton, 1998) makes it easier for them to succeed with imperfectives in this study.

highly reliable: $p < 0.001$, paired t-test). This contrast reinforces the claim that young Russians do know a truth-conditional difference between perfectives and imperfectives, despite their non-adultlike responses in Experiment 1.

4. Conclusion: Toward an Understanding of Imperfective Errors

Taken together, the results of Experiments 1 and 2 show the following. Young Russian children do not equate the truth-conditions of the imperfective aspect to that of the perfective (Experiment 2). Moreover, by agreeing that the imperfective predicate was satisfied during the frame-of-reference, they showed that they can associate an imperfective predicate with a subpart of an event (Experiment 2). We also have no reason to doubt that children will accept a present tense imperfective statement to describe a present ongoing-but-incomplete event. Therefore, we can conclude that children's difficulty with imperfectives arises specifically with conative (i.e. past incomplete) events.

At present, we can see two alternative explanations that could account for this failure. The first possibility is that in order for a child to associate an imperfective with a part of an event, the event must be non-counterfactual. Experiment 1 tested partial events whose completion was counterfactual; Experiment 2 tested partial events whose completion occurred outside the frame-of-reference. In present-tense ongoing situations the possible completion of the event lies in the future, and is therefore non-counterfactual. Under this account, children's difficulty is closely connected to the so-called *Imperfective Paradox* (Dowty, 1979; Landman, 1992).

The second possibility is that Russian children differ from adults specifically in the need to have a frame-of-reference in order to associate imperfective predicates with partial events. In this respect, the Russian children may have a representation of the imperfective that is very similar to that of the Dutch simple past by Dutch-speaking adults. Van der Feest and van Hout (2002) report that the simple past tense in Dutch has completion entailments in simple sentences, but loses the completion entailments when an explicit frame-of-reference is provided.

These hypotheses and possible experiments that distinguish between them are discussed in greater detail in our other work (e.g., Kazanina, 2002).

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