From Magical Thinking to a Usage-Based Model: Slavic Aspect Through the Prism of Cognitive Linguistics

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with: Tore Nesset, Stephen Dickey, Hanne Eckhoff, Olga Lyshevskaya, Rob Reynolds, Svetlana Sokolova, Anna Endresen, Anastasia Makarova, and Julia Kuznetsova
The Conventional Wisdom about Russian Aspect
Perfective vs. Imperfective
The Conventional Wisdom about Russian Aspect
Perfective vs. Imperfective

*aspekt dokonany i niedokonany
The Conventional Wisdom about Russian Aspect
Perfective vs. Imperfective

It’s a simple binary distinction
It’s a simple binary distinction

The Conventional Wisdom about Russian Aspect Perfective vs. Imperfective

Native speakers always know which aspect to use
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Perfective vs. Imperfective

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Even children never make errors
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Verbs come in aspectual pairs.

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Native speakers always know which aspect to use

You add a prefix to create a perfective verb

Even children never make errors

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Prefixes and suffixes tell you which verb has which aspect.

Native speakers always know which aspect to use.

There are 16 prefixes that create almost 2000 paired perfective verbs.

The Conventional Wisdom about Russian Aspect: Perfective vs. Imperfective
It's a simple binary distinction. The Conventional Wisdom about Russian Aspect Perfective vs. Imperfective

Verbs come in aspectual pairs. The prefixes are semantically empty when they create paired perfective verbs.

Even children never make errors. Native speakers always know which aspect to use.

You add a prefix to create a perfective verb. There are 16 prefixes that create almost 2000 paired perfective verbs.

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Verbs come in aspectual pairs

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You add a prefix to create a perfective verb.

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The prefixes are semantically empty when they create paired perfective verbs.

Native speakers always know which aspect to use.

But the same prefixes have meanings when combined with other verbs.

Prefixes and suffixes tell you which verb has which aspect.

There are 16 prefixes that create almost 2000 paired perfective verbs.
It's a simple binary distinction. The conventional wisdom about Russian aspect: Perfective vs. Imperfective.

Verbs come in aspectual pairs. You add a prefix to create a perfective verb. Even children never make errors.

The prefixes are semantically empty when they create paired perfective verbs. Native speakers always know which aspect to use. But the same prefixes have meanings when combined with other verbs.

Prefixes and suffixes tell you which verb has which aspect. Certain collocations trigger the use of perfective or imperfective.

There are 16 prefixes that create almost 2000 paired perfective verbs.
Bad news for this young linguist:

- **Russian aspect has magical properties:**
  - Native speakers use it perfectly from infancy
  - Non-natives can never learn it

- **Russian aspect is chaotic:**
  - Long lists of bizarre, seemingly contradictory “rules” for use
  - Long lists of collocations that supposedly trigger use
  - Complex system of over 20 morphological markers (prefixes and suffixes)
  - Long chaotic lists of meanings for prefixes, which are also capable of “turning their meaning off”
  - Tens of thousands of combinations of prefixes and suffixes with verbal roots that just have to be memorized
But none of this was true!

- **Russian aspect has magical properties:**
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  - Non-natives can never learn it

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Russian aspect meets cognitive linguistics

• Metaphorical Model:
  – PERFECTIVE IS A SOLID OBJECT, IMPERFECTIVE IS A FLUID SUBSTANCE

• Radial Category Model:
  – Meanings of prefixes form radial categories

• Verb Classifier Model:
  – Prefixes sort the verbal lexicon into semantic groups

• Usage-Based Model:
  – Statistical distribution of inflected forms marks aspect as reliably as morphemes

• Inter-Speaker Variation Model:
  – Speakers do not always agree on which aspect to use, and there are contexts in which both aspects are acceptable
Metaphorical Model of Aspect

Discrete Solid Objects

Motivate Perfective

Fluid Substances

Motivate Imperfective
Metaphorical Motivation of Aspect

Discrete Solid Objects
- Edges, inherent shape
- Unique, countable, whole
- Cannot be mixed
- Stable, sliceable
- Foreground
- Satisfying
- Forceful

Fluid Substances
- Shapeless, continuous
- Spreadable, ubiquitous
- Can be mixed
- Unstable, unsliceable
- Background
- Unsatisfying
- Gentle

Metaphorical Model
Organizing that chaotic list...

Perfective

- Can be punctual
- Partitive genitive
- Gestalt interpretation
- Specific negation (warning)
- Sequencing
- Succeeding

Imperfective

- Must have some extension, can be gnomic
- Categorical negation
- Open-ended, filling time
- Manner and gradualness
- Simultaneity
- Trying
- Historical present

Metaphorical Model
Even the “exceptions” fit...

Perfective
- Non-past is future
- (No directed vs. undirected)
- Habitual sequences
- Gnomic satisfaction potential
- Polite instructions
- Rude instructions

Imperfective
- Non-past is present
- Directed or undirected
- General-factual statement of a complete, unique event
- Polite instructions
- Rude instructions
- Implication of poor action
- Annulled action

Metaphorical Model
Radial Category Model

- 16 prefixes are added to Imperfective base verbs to create nearly 2000 “paired” Perfectives with the “same” meaning as the base verb.
- But when the same prefixes are combined with other base verbs, the prefixes clearly have meanings.
- One and the same prefix can both have meaning and not have meaning with different verbs.
- Each prefix has a long list of meanings.
- There are tens of thousands of combinations of prefixes and base verbs.

<table>
<thead>
<tr>
<th>Creation of Perfective “partner” verb with the “same” meaning</th>
<th>Imperfective base verb</th>
<th>Perfective formed by prefix ( raz- + ) Imperfective base verb</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creation of Perfective verb with a different meaning</td>
<td><code>bit’ </code>break.IMPF’</td>
<td>`raz-bit’ [RAZ-break] ‘break.PF’</td>
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Semantics:
Radial Category and Conceptual Overlap

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<th>Perfective formed by prefix raz- + Imperfective base verb</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Natural Perfective</strong></td>
<td>bit’</td>
<td>raz-bit’</td>
</tr>
<tr>
<td></td>
<td>break.IMPF</td>
<td>[RAZ-break] ‘break.PF’</td>
</tr>
<tr>
<td><strong>Specialized Perfective</strong></td>
<td>metat’</td>
<td>raz-metat’</td>
</tr>
<tr>
<td></td>
<td>sweep.IMPF</td>
<td>[RAZ-sweep] ‘scatter.PF’</td>
</tr>
</tbody>
</table>

Radial Category Model
General schema and prototype for *raz-*

“APART”:
- Outward movement in various directions from a point

- The general schema is instantiated in a variety of subcategories
- Prototype = “PHYSICAL APART”
  - Physical object divided in pieces

**RAZorvat’sja ‘explode’**

Radial Category Model
Specialized Perfectives with RAZ-

1. PHYSICAL APART

*raspilit* ‘saw apart’
Specialized Perfectives with RAZ-

rastoptat'
‘trample’

1. PHYSICAL APART

2. CRUSH

Radial Category Model
Specialized Perfectives with RAZ-
Specialized Perfectives with RAZ-

1. PHYSICAL APART
2. CRUSH
3. SPREAD (metaphor)
4. SPREAD

**razreklamirovat’**
‘publicize all over’
Specialized Perfectives with RAZ-

1. PHYSICAL APART
2. CRUSH
3. SPREAD
4. SPREAD (metaphor)
3. SPREAD
5. SOFTEN, DISSOLVE

rastvorit’ ‘dissolve’

Radial Category Model
Specialized Perfectives with RAZ-

1. PHYSICAL APART
2. CRUSH
3. SPREAD
4. SPREAD (metaphor)
5. SOFTEN, DISSOLVE
6. SWELL

razdut ‘inflate’

Radial Category Model
Specialized Perfectives with RAZ:

1. PHYSICAL APART
2. CRUSH
4. SPREAD (metaphor)
3. SPREAD
5. SOFTEN, DISSOLVE
6. SWELL
7. EXCITE

raskalit' 
'make red-hot'

Radial Category Model
Specialized Perfectives with RAZ-

1. PHYSICAL APART

2. CRUSH

3. SPREAD

4. SPREAD (metaphor)

5. SOFTEN, DISSOLVE

6. SWELL

7. EXCITE

8. EXCITE (metaphor)

razdosadovat' ‘make angry’
Specialized Perfectives with RAZ-

1. PHYSICAL APART
2. CRUSH
4. SPREAD (metaphor)
3. SPREAD
5. SOFTEN, DISSOLVE
6. SWELL
7. EXCITE
8. EXCITE (metaphor)
11. INGRESS.

razvolnovat’sja ‘become upset’
Specialized Perfectives with RAZ-

1. PHYSICAL APART
2. CRUSH
3. SPREAD (metaphor)
4. SPREAD
5. SOFTEN, DISSOLVE
6. SWELL
7. EXCITE
8. EXCITE (metaphor)
9. UN-, DIS-
11. INGRESS.

 Razgruzit’ ‘unload’

Radial Category Model
Specialized Perfectives with RAZ-

1. PHYSICAL APART
2. CRUSH
4. SPREAD (metaphor)
3. SPREAD
9. UN-, DIS-
10. UN-, DIS- (metaphor)
11. INGRESS.
8. EXCITE (metaphor)
7. EXCITE

rasśifrovat’ ‘decipher’
Radial Category Model
Specialized Perfectives with RAZ-

1. PHYSICAL APART
2. CRUSH
3. SPREAD (metaphor)
4. SPREAD
5. SOFTEN, DISSOLVE
6. SWELL
7. EXCITE
8. EXCITE (metaphor)
9. UN-, DIS-
10. UN-, DIS- (metaphor)
11. INGRESS.
Specialized and Natural Perfectives with RAZ-
Conceptual overlap and the illusion of emptiness

Specialized perfectives:

- Prefix and verb have different meanings
- The meaning of the prefix stands out

Natural perfectives:

- Prefix and verb have overlapping meanings
- The meaning of the prefix is “invisible”
- An illusion of semantic emptiness is created
But then the question arises…

Q: Why would a language need sixteen different prefixes to mark “+Perfective”?
But then the question arises...

Q: Why would a language need **sixteen** different prefixes to mark “+Perfective”?

A: Because the prefixes are **classifiers**
Verb Classifier Model

Numeral Classifier Systems Worldwide
The function of sortal numeral classifiers

• Despite the name, numeral classifiers are actually a type of noun classifiers.

• Numeral classifiers are “unitizers” that construe the referents of mass nouns as countable units, i.e., count nouns.

• Sortal numeral classifiers “sort” the nouns of the language into groups according to the units that the substances typically form, usually according to their shape, e.g.,
  – long objects
  – flat objects
  – etc.
Yucatec Maya examples of sortal numeral classifiers (Lucy 2000: 329)

<table>
<thead>
<tr>
<th>Numeral Classifier</th>
<th>Descriptor</th>
<th>Translation</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘un-tz’íit kib’</td>
<td>[one long-thin wax]</td>
<td>‘one candle’</td>
</tr>
<tr>
<td>‘un-tz’íit che’</td>
<td>[one long-thin wood]</td>
<td>‘one stick’</td>
</tr>
<tr>
<td>‘un-tz’íit nal</td>
<td>[one long-thin corn]</td>
<td>‘one ear of corn’</td>
</tr>
<tr>
<td>‘un-tz’íit há’as</td>
<td>[one long-thin banana]</td>
<td>‘one fruit of the banana’</td>
</tr>
<tr>
<td>‘un-wáal há’as</td>
<td>[one flat banana]</td>
<td>‘one banana leaf’</td>
</tr>
<tr>
<td>‘un-kúul há’as</td>
<td>[one planted banana]</td>
<td>‘one banana tree’</td>
</tr>
</tbody>
</table>

Numeral classifiers are obligatory in contexts where discrete units are referred to, as in constructions with numerals.
Verb Classifier Systems

- Verb classifiers have been identified in Chinese and in several Australian languages (McGregor 2002, Gerner 2009)

- McGregor (2002) on verb classification: “[d]oubtless it is not confined to the relatively few languages in which it has been hitherto described, though the extent of its distribution across the world’s languages remains to be charted.”
Why Russian Prefixes are Sortal Verb Classifiers

- **Russian prefixes** are “unitizers” that designate discrete events
- **Russian prefixes** are associated with quantification by perfective aspect
- **Russian prefixes** “sort” the verbs of the language according to the parameters of actions; **classification by outcome:**
  - expanding with *raz-* as in *puxnut’* ‘swell’ > *raspuxnut’* ‘swell’
  - movement away with *u-* as in *krast’* ‘steal’ > *ukrast’* ‘steal’
  - attachment with *pri-* as in *lipnut’* ‘stick to’ > *prilipnut’* ‘stick to’, etc.
- **Russian prefixes** fulfill all distributional criteria for classifiers
  - overlapping groups are characteristic of classifier systems
  - the classifiers also “show different behaviours” (McGregor 2002: 17)
Polysemy and Radial Category Structure for Classifiers and Prefixes

Radial category structure for Thai Numeral Classifier *tua* (Deepadung 1997)

![Diagram of Radial Category Structure](image)

Prototype:
1. **ANIMATE**
   - buffalo, elephant

2. **ANIMATE**
   - ghosts

3. **QUADRUPED**
   - tables, chairs

4. **FURNITURE**
   - dressers, beds

5. **LIMBED**
   - trousers, shirts

6. **CLOTHING**
   - skirts, underwear

7. **ANIMATE-SHAPED**
   - mannequins, dolls; some letters and numbers

Verb Classifier Model
Compare: Slavic Prefixes in Natural and Specialized Perfectives

Prototype:
1. APART разбить ‘break apart’

Example: Russian раз-

2. CRUSH раздавить ‘crush’
3. SPREAD разветвиться ‘branch out’
4. SWELL раздувать ‘inflate’
5. DISSOLVE растаять ‘melt’
6. EXCITEMENT раскалить ‘make red-hot’
7. UN- разгрузить ‘unload’

Natural and Specialized Perfectives share the same radial categories

Verb Classifier Model
Sortal vs. Mensural Classifiers

The Numeral Classifier Construction in Mandarin Chinese

<table>
<thead>
<tr>
<th>Classifier Type</th>
<th>Numeral</th>
<th>Classifier</th>
<th>Noun</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sortal</td>
<td>yi ‘one’</td>
<td>tiao cl: long-thin</td>
<td>shengzi rope</td>
</tr>
<tr>
<td>Mensural</td>
<td>yi ‘one’</td>
<td>bei cl: glass</td>
<td>pijiu beer</td>
</tr>
</tbody>
</table>

(Gao & Malt 2009)

- Morpho-syntactic behavior is identical
- Both types signal units
  - **Sortal**: refer to inherent units
  - **Mensural**: create units, individuate in terms of quantity
- A single classifier can serve both sortal and mensural functions
- General classifiers often serve both functions
Procedural Prefixes as Mensural Classifiers

(1) a. \(yi \ be\i \ pijiu\) (Mandarin Chinese: Gao and Malt 2009: 1129)
   one cl:glass beer
   ‘a glass of beer’

(1) b. ‘um-p’iit \(h\á’as\) (Yucatec Maya; Lucy 1992: 7)
   a cl:little-bit/some banana
   ‘a little bit of/some banana’

(2) a. \(po-\ sidet’\) (Russian)
   for-a-while- sit
   ‘sit for a while’

(2) b. \(pro-\ plakat’\) (Russian)
   for-a-time- cry
   ‘cry for a time’
## Comparison of Types of Sortal and Mensural Classifiers with Russian Prefixes

<table>
<thead>
<tr>
<th>Type of Mandarin Chinese Numeral classifier</th>
<th>Analogue Among Russian Perfectivizing Prefixes</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Individual Classifiers (Sortal)</td>
<td>Natural <em>po-</em>-, <em>s-</em>-, <em>za-</em>-, etc.</td>
</tr>
<tr>
<td><em>san pian shuye</em> ‘three leaves’</td>
<td>Specialized <em>do-</em>-, <em>s-</em>-, <em>za-</em>-, etc.</td>
</tr>
<tr>
<td>(2) Collective Classifiers (Mensural)</td>
<td>Distributive <em>pere-</em>-, <em>po-</em> Cumulative <em>na-</em></td>
</tr>
<tr>
<td><em>yi qun mianyang</em> ‘a flock of sheep’</td>
<td></td>
</tr>
<tr>
<td>(3) Individuating Classifiers (Mensural)</td>
<td>Delimitative <em>po-</em>-, Perdurative <em>pro-</em></td>
</tr>
<tr>
<td><em>yi bei piju</em> ‘a glass of beer’</td>
<td>Attenuative <em>pri-</em>-, <em>pod-</em> Ingressive <em>za-</em></td>
</tr>
<tr>
<td></td>
<td>Finitive <em>ot-</em>-, Intensive-Resultative <em>do-</em>...<em>sja</em>, <em>za-</em>...<em>sja</em>, etc.</td>
</tr>
<tr>
<td>(4) Partitive Classifiers (Mensural)</td>
<td>Semelfactive <em>s-</em>-, <em>-nu-</em></td>
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<tr>
<td><em>shi pian luobo</em> ‘ten slices of carrot’</td>
<td></td>
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Verb Classifier Model
Usage-Based Model

• Usage-based model reveals statistical tendencies
  – In aggregate, Perfective verb forms behave differently from Imperfective verb forms, regardless of morphological marking
• How distribution of forms marks aspect
  – Distribution of forms is just as reliable a predictor of aspect as morphological marking
Grammatical profiles: Statistical Tendencies

Verbs have different forms:

- *eat* 749 M
- *eats* 121 M
- *eating* 514 M
- *eaten* 88.8 M
- *ate* 258 M

The grammatical profile of *eat*

Usage-Based Model
Grammatical Profiles of Russian Verbs **Top-Down**

<table>
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<tr>
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<th>Past</th>
<th>Infinitive</th>
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<tr>
<td>Imperfective</td>
<td>1,330,016</td>
<td>915,374</td>
<td>482,860</td>
<td>75,717</td>
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<tr>
<td>Perfective</td>
<td>375,170</td>
<td>1,972,287</td>
<td>688,317</td>
<td>111,509</td>
</tr>
</tbody>
</table>

**chi-squared**

\[= 947756\]

**df = 3**

**p-value < 2.2e-16**

**effect size**

(Cramer’s V)

\[= 0.399\]

(medium-large)
### Grammatical Profiles of Russian Verbs **Top-Down**

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**Can we turn this upside-down and go Bottom-Up?**

![Bar chart showing usage-based model](chart.png)
Grammatical Profiles of Russian Verbs **Bottom-Up**

Data extracted from the manually disambiguated Morphological Standard of the Russian National Corpus (approx. 6M words), 1991-2012
Stratified by genre, 0.4M word sample for each

<table>
<thead>
<tr>
<th>Genre</th>
<th># Verb Tokens</th>
<th># Verb Lemmas</th>
<th># Verb Lemmas Frequency &gt;50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Journalistic</td>
<td>52,716</td>
<td>5,940</td>
<td>185</td>
</tr>
<tr>
<td>Fiction</td>
<td>78,084</td>
<td>8,665</td>
<td>225</td>
</tr>
<tr>
<td>Scientific-Technical</td>
<td>43,528</td>
<td>4,494</td>
<td>172</td>
</tr>
</tbody>
</table>
Correspondence Analysis of Journalistic Data

**Input:** 185 vectors (1 for each verb) of frequencies for verb forms

Each vector tells how many forms were found for each verbal category: indicative non-past, indicative past, indicative future, imperative, infinitive, non-past gerund, past gerund, non-past participle, past participle

**rows are verbs, columns are verbal categories**

**Process:**

Matrices of distances are calculated for rows and columns and represented in a multidimensional space defined by factors that are mathematical constructs. Factor 1 is the mathematical dimension that accounts for the largest amount of variance in the data, followed by Factor 2, etc.

Plot of the first two (most significant) Factors, with Factor 1 as x-axis and Factor 2 as the y-axis

You can think of **Factor 1** as the **strongest parameter** that splits the data into **two groups** (negative vs. positive values on the x-axis)

Usage-Based Model
On the Following Slide…

- Results of correspondence analysis for Journalistic data
- Perfective verbs represented as “p”
- Imperfective verbs represented as “i”
- Remember that the program was not told the aspect of the verbs
- All it was told was the frequency distributions of grammatical forms
- All it was asked to do was to construct the strongest mathematical Factor that separates the data along a continuum from negative to positive (x-axis)
Comparison of reliability of morphological markers vs. grammatical profiles in predicting aspect of verbs

<table>
<thead>
<tr>
<th></th>
<th>Morphological markers (simple model)</th>
<th>Morphological markers (complex model)</th>
<th>Grammatical profiles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Journalistic</td>
<td>94.0%</td>
<td>96.7%</td>
<td>91.3%</td>
</tr>
<tr>
<td>Fiction</td>
<td>90.6%</td>
<td>93.3%</td>
<td>91.5%</td>
</tr>
<tr>
<td>Scientific-Technical</td>
<td>94.6%</td>
<td>97.6%</td>
<td>95.8%</td>
</tr>
</tbody>
</table>

There are **no statistically significant differences** in this table.

Aspect can be predicted equally well **based on grammatical profiles alone**.

Closer inspection reveals that markers & profiles complement one another.
Inter-Speaker Variation Model

Do native speakers always know which aspect to use?

- We have conducted an experiment with over 500 native speakers and their reactions to aspectual choices for verbs in extended authentic contexts (1100-1600 words) representing various genres.
- For each verb where it was morphologically possible to form both a Perfective and an Imperfective form, participants rated both the original form and the corresponding form of the opposite aspect as “Impossible” = 0, “Acceptable” = 1, or “Excellent” = 2.
- (Frequency has very little effect on the ratings)
What our experiment looked like:

В квадратных скобках всегда предлагается два глагола на выбор. Для каждого глагола выберите уровень приемлемости ("Отлично", "Допустимо" или "Невозможно") в данном контексте. Оба глагола в квадратных скобках могут получить одинаковую оценку. Выбор уровня приемлемости зависит от вашего личного восприятия.

По завершении задания вы получите лотерейный код. Не оставляйте никаких глаголов на голубом фоне и не отвечайте случайным образом, иначе ваш код будет исключен из лотереи.

Участие в эксперименте добровольно. Вы можете прервать эксперимент в любой момент. Согласно условиям эксперимента, вы понимаете и принимаете условия эксперимента.

Право выбора жизненного пути — большой подарок судьбы. У Василия этого права не было. Он безропотно [принял / принимал] выбор, который за него [сделала / делала] судьба, и это был великий шаг.

Василий родился в семье зажиточного кулака в Брянской области. Когда мальчику [исполнилось / исполнялось] три года, его отец [сucceeded / сходился] с работницей. Мать Василия была из семьи священника, и ничего муку не [сказала / говорила], по-христиански [потерпела / терпела] все
Weighted average ratings

$r = -0.761$
$p = 4.57 \times 10^{-128}$

$C =$ "control" item

$Ti/Tp =$ trigger present

- **Pfv original tok**
- **Ipfv original tok**

- **original tok**
- **non-original tok**
81% of the data is here. Speakers reliably recover the original aspect. Redundancy is HIGH. Saliency of construal is LOW.

Weighted average ratings

$r = -0.761$
$p = 4.57E-128$

C = "control" item
Ti/Tp = trigger present
Pfv original tok
Ipfv original tok
17% of the data is here. Speakers accept both aspects. Redundancy is LOW. Saliency of construal is HIGH.
Redundancy and Construal

- Relationship between redundancy and construal has not previously been studied empirically
- Redundancy and construal co-exist on a continuum
  - **High redundancy:** meanings of Perfective and Imperfective are anchored by context, highly redundant, and this is the center of gravity where most uses are observed, most entrenchment
  - **Free construal:** construal operates independently of redundancy, speakers can represent the “same” content in two ways
- Between these two extremes there are varying degrees of redundancy and freedom of construal
- It is likely that **construal needs the redundant uses to empower it to operate on its own when redundancy is reduced.**
Inter-Speaker Variation Model Summary

The Short Story:

- Native speakers generally agree on the original aspect (81%)
- In some contexts native speakers accept both aspects (17%)
- Presence vs. absence of “triggers” does not change distribution
- Frequency is not a factor
- Native speakers are more consistent in rating the original aspect
- There is a lot of variation!
- There are no clear groups in this data!
What we know now:

- Metaphorical mapping of properties of matter accounts for aspect
- Prefixes aren’t empty; they have radial category structure
- Prefixes serve as verb classifiers
- Perfective verbs behave differently than Imperfective verbs
- Aspect can be predicted by grammatical profiles
- Morphological markers are no more reliable than grammatical profiles
- Contextual triggers listed in grammars co-occur with only 2% of verbs
- Native speakers correctly guess original aspect about 81%
- (So there must be some as-yet unknown contextual clues)
- But there is a lot of variation
- And there are contexts where both aspects are possible
What’s next:

• Experiment to test metaphorical mapping of properties of matter
• Corpus data, experiments, and machine learning to ferret out and model the way that native speakers use context to select aspect
• Discover differences between contexts where aspect is determined and where it is open to construal
• Investigate other evidence for the relationship between redundancy and construal, since all languages have a multitude of grammatical categories presenting choices that are partially dependent on context
• Build effective resources for language learners
Bibliography (and references therein)


