“Is Russian a Verb Classifier Language?”

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Abstract

I put forth a new hypothesis that Russian verbal prefixes are a verb classifier system similar to those found in Australian and East Asian languages (McGregor 2002). Sixteen Russian prefixes have a “purely aspectual” use where they do not change the meaning of the verb, as in *s-varit’*, which means ‘cook’ and is merely the perfective partner verb of *varit’* ‘cook’. I argue that the “purely aspectual prefixes” constitute a system of aspectual classifiers akin to numeral classifiers. I present tests for this hypothesis that include comparison of distributional data with definitions for classifier systems, plus five statistical studies proving that the behavior of each prefix is unique and explainable by recourse to its meaning. Recognizing Russian as a verb classifier language brings numerous advantages, facilitating cross-linguistic comparisons and improving both description and theoretical understanding of classifier systems.

1. The Verb Classifier Hypothesis

This article aims to test the following hypothesis:

(1) The Russian “purely aspectual” prefixes are a verb classifier system.

My goal is to submit the Verb Classifier Hypothesis to a rigorous set of tests. Section 2 offers a brief discussion of classifier systems, drawing parallels with Russian verbal prefixes. In Section 3 I evaluate the Russian “purely aspectual” prefixes according to standard definitions of classifiers. Sections 4 through 8 present five statistical studies. Conclusions appear in Section 9.

I distinguish among four basic types of perfectives in Russian (Janda 2007), three of which are relevant here:

* **Natural Perfectives**, where the lexical meaning matches that of the imperfective simplex verb, as in *s-varit’* ‘cook’ which is the perfective partner verb of the imperfective *varit’* which also means ‘cook’. Prefixes used to form Natural Perfectives are often characterized as “purely aspectual” or “semantically empty” (cf. Švedova et al. 1980). I acknowledge as Natural Perfectives the verbs in the Exploring Emptiness database found at http://emptyprefixes.uit.no/.
* **Specialized Perfectives**, where the lexical meaning of the verb is different from that of the corresponding simplex verb, as in *raz-varit’* ‘cook until soft’.
* **Complex Act Perfectives**, where the prefix sets boundaries on the action named in the simplex verb, as in *po-varit’* ‘cook for a while’.

I compare the use of prefixes in Natural Perfectives with their use in the other types of perfectives where it is uncontroversial that prefixes have meanings.

2. Numeral Classifier Systems as a Model

Among noun classifier systems, gender systems are the most common type worldwide, followed by the numeral classifier type. Numeral classifier systems are most common in languages of Asia and South America (Aikhenvald 2000: 98-124). Table 1 shows examples of how numeral classifers are used in Yucatec Maya.

|  |  |  |
| --- | --- | --- |
| *‘un-tz’íit kib’* | [one long-thin wax] | ‘one candle’ |
| *‘un-tz’íit che’* | [one long-thin wood] | ‘one stick’ |
| *‘un-tz’íit nal* | [one long-thin corn] | ‘one ear of corn’ |
| *‘un-tz’íit* *há’as* | [one long-thin banana] | ‘one fruit of the banana’ |
| *‘un-wáal há’as* | [one flat banana] | ‘one banana leaf’ |
| *‘un-kúul há’as* | [one planted banana] | ‘one banana tree’ |
| *‘un-kúuch há’as* | [one load banana] | ‘one bunch of bananas’ |

Table 1: Examples of numeral classifiers in Yucatec Maya (from Lucy 2000: 329)

The classifier system in Yucatec Maya has two types of reference: a bare noun without a classifier refers to a substance, while objects are specified by adding classifiers. Russian has two types of verbs: imperfective, which is the default value for a simplex stem, and perfective, often signaled by the addition of a prefix. Janda (2004) showed that imperfective verbs in Russian behave like nouns that refer to substances, while perfective verbs behave like nouns that refer to objects. A simplex Russian verb nearly always refers to the verbal equivalent of a substance. If we want to talk about an event in Russian, we need to add a prefix and perfectivize the verb; this is parallel to using a classifier in Yucatec Maya to refer to an object.

Classifiers are associated with the use of numerals. Aspect in Russian, and particularly perfective aspect, has been described as a type of quantification (Jakobson 1957/1971: 136; see also Smith 1991 and Dahl 1985).

Shape is the most common parameter conveyed by numeral classifiers cross-linguistically (Aikhenvald 2000: 98 and Lyons 1977: 465-466). Russian verbal prefixes are transparently related to prepositions with spatial meanings. The shape an object takes in space is thus paralleled by the spatio-temporal contours of an event.

Nouns in Yucatec Maya are sorted into groups by their classifiers. Russian prefixes likewise divide the simplex verbs into groups. Figure 1 visualizes this soritng effect: each bar represents the number of simplex verbs that form Natural Perfectives with the given prefix, ranging from three Natural Perfectives formed with the prefix *v*- to 417 Natural Prefixes formed with the prefix *po*-.

Figure 1: Distribution of Natural Perfectives across prefixes

Both Yucatec Maya numeral classifiers and Russian “purely aspectual” prefixes have been considered by some linguists to be purely formal, semantically empty markers. Numeral classifiers are now recognized to have a semantic sorting function. The argument that Russian has a verb classifier system is de facto also an argument against the traditional “empty prefix” model.

Given the clear parallels between numeral classifiers and Russian verbal prefixes, one might ask: Why has Russian not been recognized as a verb classifier language before? Linguists have only recently become aware of verb classifier systems. McGregor (2002: 404) states in that verb classification “has not yet been incorporated into mainstream linguistic knowledge as a category that might be expected in a language”, but that it is “a far from exotic phenomenon” and “[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.”

In this article I take a comprehensive approach to the collection and quantitative analysis of data to support the Verb Classifier Hypothesis.

3. Distributional Evidence

McGregor (2002: 16-22) and Gerner (2009: 708) give a four-part definition of classification (presented in italics below), and here I evaluate how Russian measures up if we assume that “classifiers” are prefixes and “classifieds” are verbs.

*(i) There are a finite number of ways in which classifiers and classifieds can co-occur.* For Russian, the prefixes and verbs co-occur in prefixed verbs.

*(ii) The group of classifiers has more than one element.* Russian has sixteen prefixes that form Natural Perfectives.

*(iii) The group of classifieds has significantly more elements than the group of classifiers.* Russian has 1,429 verbs that are classified by the sixteen prefixes.

*(iv) At least two of the groups of classifieds that are associated with two different classifiers must be significantly different from each other.* Sections 4 and 5 prove in detail that each prefix is associated with a different group of verbs.

Russian prefixes pass all four tests for classifiers. McGregor (2002: 17) makes an additional requirement that the members of a set of classifiers “must show different behaviours”. The five case studies presented in the following sections give evidence that the prefixes behave differently.

4. Behavioral Evidence 1: Radial Category Profiling of *v*-, *pod*-, *pere*-, *pri*-, *ot*-, *v(о)z*-, *u*-, *iz*-, *raz*-, *vy*-, *о(b)-[[2]](#footnote-2)*

We divide the sixteen prefixes into two groups in order to optimize the analysis. The eleven “small” prefixes presented in this section form few enough Natural Perfectives to facilitate a detailed analysis, but do not present enough data to support statistical models.

The empirical method applied in this section belongs to a suite of quantitative methods developed at the University of Tromsø for analysis of form-meaning relationships. Radial category profiling is one of these methods, and it analyzes the distribution of data across radial category networks, such as the related submeanings of a given linguistic unit.

Polysemy is characteristic of Russian prefixes, cf. the sample of Specialized Perfectives of *raz-* in Table 2.

|  |  |  |
| --- | --- | --- |
| simplex verb | *raz-*prefixed verb | meaning of *raz-* |
| *pilit’* ‘saw’ | *raz-pilit’* ‘saw apart’ | apart |
| *toptat’* ‘stamp one’s feet’ | *raz-toptat’* ‘trample’ | crush |
| *katat’* ‘roll’ | *raz-katat’* ‘roll out (dough)’ | spread |
| *dut’* ‘blow’ | *raz-dut’* ‘inflate’ | swell |
| *gruzit’* ‘load’ | *raz-gruzit’* ‘unload’ | un- |

Table 2: Some Specialized Perfectives and the meanings contributed by *raz-*

The radial category model of meaning was inspired by the work of Rosch (1978), who showed that human beings organize examples of a concept in radial categories, with a central prototype and other less central examples that bear some relationship to the prototype. Cognitive linguistics (cf. Lakoff 1987, Taylor 2003) has adopted the radial category model for semantic analysis as an effective means for modeling complex networks of meanings. Rather than being defined by features and boundaries, radial categories are defined by relationships to a prototype.

The radial category profiling method involves comparing radial categories. If we discover that two radial categories share some meanings, the internal structure of the categories will show us whether the shared meanings are distributed in a random fashion or whether they constitute a coherent subset. Overlap that involves coherent subsets shows us that the same radial category is present for the items being compared, though the radial category may be more extensive for one item than for the other.

Radial category profiling of prefixes involves comparison of behaviors of Natural Perfectives as opposed to Specialized and Complex Act Perfectives. The analysis involves three steps for each prefix. First the radial category of prefix meanings is established on the basis of the verbs in which prefix meaning is clear and uncontroversial: the Specialized and Complex Act Perfectives, such as those represented in Table 3. Next, the meanings of the simplex verbs that use the same prefix to form Natural Perfectives are analyzed in terms of a radial category. Finally, the two radial categories are compared to check for overlap.

Radial category profiling has been carried out on the basis of approximately two thousand verbs for all eleven small prefixes, and all the results are available at http://emptyprefixes.uit.no/methodology\_rus.htm. In this section, I present the analysis of the prefix *raz-*.

The radial category in Figure 2 is based on analysis of 148 Specialized Perfectives. Figure 2 visually collapses all three steps of the analysis. The boxes represent the meanings of *raz-*, based on the Specialized Perfectives (SP). The numbers in parentheses represent the number of verbs found in each meaning for each type of perfective, and one example is given for each type. Boxes that show overlap between the meanings of *raz-* and the meanings of the simplex verbs that form Natural Perfectives with *raz-* are shaded. For example, meaning 1 is APART; there thirty-eight Specialized Perfectives like *raz-pilit’* ‘saw apart’ with this meaning; and there are twenty-two Natural Perfectives like *raz-gryzt’* ‘gnaw’with this meaning.

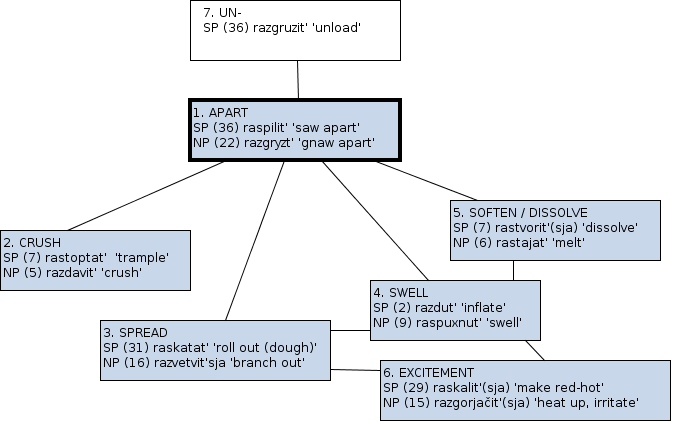


Figure 2: Radial Category for the prefix *raz-*

The prototypical meaning of *raz*-, apart, involves breaking up the unity of either a group or an object, such that individuals or parts go their separate ways. The link between apart and crush is motivated by the fact that when something is crushed, its internal structure is destroyed (taken apart) and the edges may move outward. A cluster of meanings (3-6) focuses on the dispersal that is inherent in apart, yielding spread, swell, and soften/dissolve. Because excitement tends to spread and things that are excited often swell, we also have a meaning of excitement in this cluster. The final meaning is un-, which is related to the prototype in that undoing something is a kind of taking apart. All of the boxes except 7 in Figure 2 are shaded, indicating that we find both Specialized Perfectives and Natural Perfectives in the majority meanings. There are no Natural Perfectives in the un- meaning. A Natural Perfective is by definition a verb that has the same meaning as the corresponding simplex verb. The un- meaning creates prefixed perfectives that have the opposite meaning of the simplex verbs. This clash makes it impossible to form Natural Perfectives from *raz*- in this meaning.

All eleven small prefixes behave similarly. For two prefixes overlap is complete, covering all meanings in the radial category: *u*- and *v*-. For seven prefixes overlap includes most meanings in the radial category: *raz*-, *pri*-, *ot-*, *v(o)z*-, *o(b)*-, *vy*- and *iz*-. Two prefixes show overlap in a minority of meanings: *pere*- and *pod*-. In all instances where overlap is incomplete, the prototypical meaning plus a coherent subset of neighboring meanings exhibit overlap. There is also a clear logic to the pattern of meanings excluded from overlap. The meanings where we do not find Natural Perfectives are incompatible with simple perfectivization in that they involve negation, comparison, quantification, or some other special qualification.

The effect of the prefix on the verb is minimized in Natural Perfectives due to overlap. Each prefix selects the simplex verbs that conform best to the meanings in its radial category, and together the prefixes sort the perfectivizable simplex verbs into groups as predicted by the Verb Classifier Hypothesis. Our next task is to see whether there is evidence of prefixal meaning in Natural Perfectives among the remaining five prefixes, and that is the topic of Section 5.

5. Behavioral Evidence 2: Semantic Profiling of *po*-, *s*-, *nа*-, *zа*-, *prо*-[[3]](#footnote-3)

The Russian National Corpus (www.ruscorpora.ru, henceforth “RNC”) uses a system of semantic tags based on work by the Moscow Semantic School. We look at the distribution of semantic tags for Natural Perfectives and submit these results to statistical tests for significance, effect size, and the degree of attraction (or repulsion) for each combination of prefix and semantic tag.

The chi-square test requires a minimum of five expected observations in each cell of a matrix and assumes that all observations are independent. Over 63% of all Natural Perfectives in Russian are prefixed with *pо*-, *s*-, *nа*-, *zа*-, and *prо*-; thus they provide a large enough quantity of data across a small enough number of prefixes to satisfy the minimum requirement for the test. If we take the semantic tags for which we have at least fifty verbs across the five prefixes, we have four categories for semantic tags: ‘impact’, ‘changest’, and ‘behav’, plus a combined category of ‘sound’ and ‘speech’.

The assumption of independent observations means that we have to take two measures in order to make our data suitable for a chi-square analysis, because there are both verbs that select more than one prefix and verbs that have more than one semantic tag in the RNC. After restricting the data to include only the five prefixes and five semantic tags, and only verbs that take exactly one prefix and have exactly one semantic tag, we have 382 verbs distributed as shown in Table 3. A full list of these verbs and details concerning how values were calculated are available on our website (http://emptyprefixes.uit.no/semantic\_eng.htm).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | *pо-* | *s-* | *nа-* | *zа-* | *prо-* | row totals |
| ‘impact’ | 11 | 23 | 31 | 47 | 10 | 122 |
| ‘changest’ | 62 | 11 | 3 | 22 | 4 | 102 |
| ‘behav’ | 11 | 23 | 17 | 1 | 0 | 52 |
| ‘sound’ & ‘speech’ | 37 | 9 | 8 | 1 | 51 | 106 |
| column totals | 121 | 66 | 59 | 71 | 65 | Grand total: 382 |

Table 3: Distribution of prefixes across semantic tags

Table 3 is visualized in Figure 3. *Po-* favors ‘changest’, while *pro*- is dominated by ‘sound’ & ‘speech’. ‘Impact’ makes a strong showing in *s*-, *na*-, and *za*-, but the balance of other semantic tags is different for each one.

Figure 3: Semantic profiles of *pо*-, *s*-, *nа*-, *zа*-, and *prо*-

The p-value (probability value) of the chi-square test tells us the likelihood that we would get the observed distribution (or one that is even more uneven) if there was no relationship between semantic tags and prefixes. The chi-square value is 248, with 12 degrees of freedom, and a p-value of 2.2e-16 (an extremely low value). In other words, the result is statistically very significant. We measure the effect size by calculating the Cramer’s V value, which can range from 0 to 1 is evaluated according to the following scale: 0.1 is considered “small”, 0.3 is considered “moderate”, and 0.5 is considered “large”. The Cramer’s V value for our data is 0.8, which far exceeds the standard measure for a large effect.

We have thus found that the distribution of prefixes across semantic tags of verbs is both highly significant and has a large effect size. We can with confidence state that the differences we see in Figure 3 are robust and meaningful. This study, like the previous one, shows that each prefix seeks out a specific group of verbs.

6. Behavioral Evidence 3: Constructional Profiling of *na*-, *za*-, *po*-[[4]](#footnote-4)

The Russian verb *gruzit’* ‘load’has three Natural Perfectives prefixed in *nа*-, *zа*-, and *pо*-, and all four verbs can appear in both the “theme-object” construction, as in *gruzit’ jaščiki na telegu* ‘load the boxes onto the wagon’*,* and the “goal-object” construction, as in *gruzit telegu jaščikami* ‘load the wagon with boxes’. The objective in this section is to show that the three prefixes behave differently in terms of their distribution across the two constructions. This different behavior provides evidence in support of the Verb Classifier Hypothesis.

1,920 examples of the ‘load’ verbs were extracted from the RNC, and of these 895 are active forms while 1,025 are passive participles. The distribution of active forms is shown in Table 4, and this data is visualized in terms of percentages in Figure 4.

|  |  |  |  |
| --- | --- | --- | --- |
|  | theme-object constructions | goal-object constructions | total |
| *gruzit’* | 208 | 78 | 286 |
| *na-gruzit’* | 34 | 113 | 147 |
| *za-gruzit’* | 94 | 114 | 208 |
| *po-gruzit’* | 253 | 1 | 254 |

Table 4: Numbers of examples of active forms for the two constructions

Figure 4: Examples of active forms as percentages for each verb

Each of the ‘load’ verbs has a unique constructional profile: unprefixed *gruzit’* prefers the theme-object construction, but is found with the goal-object construction. *Na-gruzit’* shows the opposite tendency, since the theme-object construction is less frequent than the goal-object construction. For *za-gruzit’* the distribution is nearly balanced between the theme-object construction and the goal-object construction. *Po-gruzit’* is found almost exclusively in the theme-object construction.

Although this distribution is statistically significant with a large effect size,[[5]](#footnote-5) this represents less than half of the data and it appears that there are other factors that have to be taken into account, so a simple chi-square test is not enough.

The use of passive forms clearly has an influence on the choice of the construction. For passive forms, one construction is preferred in over 95% of examples for every verb. The preference of the simplex verb *gruzit’* is the reverse of what it is for active forms: for passive forms the goal-object construction is strongly preferred and the theme-object construction is nearly excluded. Both *na-gruzit’* and *za-gruzit’* have a preference for the goal-object construction among active forms, and this preference is enhanced to the point that the goal-object construction is nearly exclusive. Only the constructional profile of *po-gruzit’* remains unchanged, with a strong preference for the theme-object construction.

Reduced versions of the constructions where the theme-object construction names only the theme and the goal-object construction names only the goal are fairly common and found with all of the prefixes. In all, there are 1,353 examples of full constructions in our database and 567 examples of reduced constructions.

We want to discover whether the prefixes in the Natural Perfectives influence the choice of the grammatical construction. Two other factors may be relevant: the use of active vs. passive forms and the use of full vs. reduced constructions. We gauge the contributions of the various factors by using a logistic regression model. In addition to looking at the individual contribution of each variable, which is called a “main effect”, the logistic regression model can discover whether two or more independent variables have a combined effect, which is called an “interaction”. Our database and the analysis are available on our website (http://emptyprefixes.uit.no/constructional\_eng.htm). The logistic regression analysis shows that all of the independent variables, namely the choice of prefix, the use of passive participles, and the use of reduced vs. full constructions, serve as main effects. In addition there is an interaction between choice of prefix and the use of active vs. passive forms. The following highly significant correlations are listed in order of relative strength, starting with the strongest one:

* *Na-gruzit’* and *za-gruzit’* prefer the goal-object construction.
* Unprefixed *gruzit’* and *po-gruzit’* favor the theme-object construction.
* The use of passive participles contributes to the choice of the construction, and this varies according to the choice of prefix.
* Full constructions are more often found with the theme-object construction, while goal-object constructions are more likely to be reduced.

The model has high correlation strength and correctly predicts the construction for 88.5% of examples.

To summarize, the analysis supports the Verb Classifier Hypothesis: the prefixes behave differently in terms of choice of construction. This is confirmed even though there are other factors that show significant relationships.

7. Behavioral Evidence 4: Prefix Variation[[6]](#footnote-6)

The verb *gruzit’* ‘load’, analyzed in Section 6, illustrates prefix variation because it forms Natural Perfectives from not one, but three prefixes. It is essential to measure prefix variation in order to show that it does not conflict with the distributional requirements for recognizing Russian as a verb classifier language. Classifiers typically do show some variation of this type, in that some classifieds can combine with more than one classifier. However, it should be the case that the majority of classifieds use one classifier and variation should be systematic and should reflect semantic patterns.

In the Exploring Emptiness database we find 1,429 imperfective simplex verbs in Russian that form 1,981 Natural Perfectives via prefixation. 1,043 simplex verbs select one and only one prefix. The remaining 386 (27%) simplex verbs show prefix variation. Prefix variation can involve up to six prefixes that attach to a single simplex verb. There are 283 simplex verbs that form two Natural Perfectives, 75 simplex verbs that form three Natural Perfectives, 21 that form four Natural Perfectives, and only 4 and 3 simplex verbs that form five and six Natural Perfectives respectively.

Prefix variation involves all sixteen prefixes, and the extent to which a prefix is engaged in prefix variation is roughly keyed to the overall frequency of the prefix. Highly frequent prefixes like *po*-, *s*-, and *za*- are also more often involved in prefix variation and can be combined with all or nearly all other prefixes.

A prefix combination is a particular selection of prefixes that are used by one or a group of simplex verbs that participate in prefix variation. Thus for example *gruzit’* ‘load’ has the prefix combination *na-*|*za-*|*po-* because it can form Natural Perfectives with these three prefixes. However, binary prefix combinations are by far the most frequent. Theoretically it is possible to make 120 binary combinations of sixteen prefixes (120 = 16x15/2), but only a few of them are common. There are thirty-one binary combinations that are used by three or more simplex verbs, twenty-three that are rare and sixty-six that are not found at all. Many of the unattested combinations involve prefixes with clearly opposed meanings, such as *pri-*|*u-*, where *pri*- indicates arrival, but *u*- forms verbs expressing departure. A full list can be found on our website (http://emptyprefixes.uit.no/variation\_eng.htm).

We examine one case study in order to demonstrate the dynamic relationship between compatible and incompatible meanings found in a prefix combination. Table 5 lists all the simplex verbs than can form Natural Perfectives with both *za*- and *u*-, including both binary and larger combinations. We see that most of these verbs can be gathered into semantic groups, listed on the left.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Semantic group | Simplex verb | *za*- meaning | *u*- meaning | Prefix combination |
| damage | *davit’* ‘crush’ | change to a fixed state | harm | ***za-*|***pо-*|***u-*** |
| *dušit’* ‘strangle’ | change to a fixed state | harm | ***za-*|***pо-*|***u-*** |
| *morit’* ‘exterminate’ | change to a fixed state | harm | *vy-*|***zа-*|***pо-*|***u-*** |
| *kolot’* ‘stab’ | change to a fixed state | harm | *v-*|***zа-*|***raz-*|***u-*** |
| *vjanut’* ‘wilt’ | change to a fixed state | harm | ***zа*-|*u*-** |
| *trambovat’* ‘ram’ | change to a fixed state | move downwards | *vy-*|***zа-*|*u-*** |
| change of state | *vjaznut’* ‘get stuck’ | change to a fixed state/ attachment | keep/save | ***zа*-|*u*-** |
| *gasit’* ‘extinguish’ | change to a fixed state | reduce | ***za-*|***pо-*|***u-*** |
| *molknut’* ‘fall silent’ | change to a fixed state | reduce | ***zа-*|***s-*|***u-*** |
| wrap | *kutat’* ‘wrap’ | cover | cover completely | ***zа-*|***o(b)-*|***u-*** |
| *motat’* ‘wind’ | cover | cover completely | ***zа-*|***nа-*|*pо-*|*prо-*|***u-*** |
| *pakovat’* ‘pack’ | cover | place/fit | ***zа*-|*u*-** |
| other | *činit’* ‘fix’ | change to a fixed state | harm | ***zа-*|***o(b)-*|*pо-*|***u-*** |
| *platit’* ‘pay’ | change to a fixed state | move away | ***zа*-|*u*-** |

Table 5: Simplex verbs that select the prefix combination *zа*-|*u*-

The simplex verbs that form their Natural Perfectives with *zа*- and *u*- highlight the common ground these prefixes share. *Zа*- in its change to a fixed state meaning and *u-* in its harm meaning both refer to events that reduce capacity and mobility, yielding the damage group. A similar relationship is present in the change of state group, which also focuses on both fixed states and reduction. The wrap group capitalizes on the fact that both prefixes are associated with covering and putting things in containers.

The semantic groups in Table 5 intersect. All types of damage and wrapping result in a change of state. All of the wrapping verbs entail loss of mobility, as well as an increase in control. Thus the intersection of damage, wrap, and change of state define nearly the whole group of verbs with the *zа*-|*u*-combination, with the exception of *činit’* ‘fix’and *platit’ ‘pay’*.

In some cases the two Natural Perfectives are clearly semantically distinct, as in for example *kolot’* ‘stab’, which has *za-kolot’* ‘slaughter’ vs. *u-kolot’* ‘prick’. In other cases the meanings are very close. The Natural Perfectives of the change of state group can be interchangeable in some contexts, as in (2)-(3). However, these two prefixed perfectives are motivated in slightly different ways: *za-vjaznut’* ‘get stuck’ involves getting caught on something as signalled by the attach and change to a fixed state meanings of *zа*-, whereas *u-vjaznut’* ‘get stuck’focuses on the downward direction of *u*- and describes sinking down into something.

(2) *Idet zajac mimo bolota, vdrug vidit -- los’ v trjasine* ***za-vjaz****.* [Kollekcija anekdotov: zveri (1970-2000)]

‘A hare walks by a swamp and suddenly sees that a moose **has gotten stuck** in the mire.’

(3) *Predstavljaeš’, ja segodnja na beregu v gline* ***u-vjaz****, a ona menja vyvolokla.* [Vladislav Krapivin. Boltik (1976)]

‘Just imagine, today I **got stuck** in the clay on the riverbank, and she pulled me out.’

Prefix variation is clearly governed by the meanings of the prefixes involved. The simplex verbs that can show overlap with more than one prefix tend to cluster in groups according to their meanings. While many examples of prefix variation are motivated by similarity of meanings across prefixes, we can detect in most cases differences between the Natural Perfectives of a given simplex verb, and often the prefixes focus on possible contrasts within the meaning of the simplex verb. There is a delicate balance between similarity and contrast, since even very near synonyms can have slightly different meanings in some contexts. We also see that meaning is a deciding factor in prefix combinations that are rare or do not exist, since prefixes with meanings that are incompatible avoid prefix variation.

Our study of prefix variation supports the Verb Classifier Hypothesis because there is evidence that prefix variation is governed by relationships between the meanings of the prefixes and the meanings of simplex verbs. Prefix variation exists because different prefixes can focus the meanings of a simplex verb in different ways. Prefix variation thus enriches the spectrum of shades of meaning that verbs can express in Russian.

8. Behavioral Evidence 5: Aspectual Triplets

An aspectual triplet is a set of three verbs with the same lexical meaning consisting of: a simplex verb, a prefixed Natural Perfective, and a secondary imperfective derived via suffixation of the Natural Perfective. An example is *množit’sja*, *u-množit’sja*, *u-množ-at’sja*, all of which mean ‘multiply, increase’. Aspectual triplets are not traditionally acknowledged in Russian linguistics; it is assumed instead that secondary imperfectives are formed only from Specialized Perfectives, not from Natural Perfectives (cf. Vinogradov et al. 1953: 431-432).

Our aim is to explore the extent of the triplet phenomenon and to show that it is governed by the meanings of the prefixes. The prefixes show different behaviors in terms of the formation of triplets and this is further evidence in support of the Verb Classifier Hypothesis.

The purpose of the Russian imperfectivizing suffixes *-yvа/-iva, -va, -а/-ja* is to supply imperfective partner verbs for perfectives as needed. Тhis strategy is nearly universal among Specialized Perfectives, where the perfective verb would otherwise lack an imperfective partner. For example, the Specialized Perfective *pere-pisat’* ‘rewrite’ is formed from the simplex *pisat’* ‘write’. Because the Specialized Perfective has a clearly different meaning, the simplex cannot serve as its aspectual partner verb, and a secondary imperfective *pere-pis-yvat’* ‘rewrite’is created with the help of the suffix *-yva.*

A Natural Perfective formed via prefixation of a simplex verb already has an imperfective partner verb because the simplex shares the same lexical meaning. For example, the Natural Perfective *u-množit’sja* ‘multiply’ already has the imperfective partner verb *množit’sja*. There should be no need for an additional imperfective partner verb here. Nonetheless, the secondary imperfective *u-množ-at’sja* is robustly attested, with nearly 500 examples like (4) in the RNC.

(4) *А ved’ zazerkal’e -- prodolženie doma, s pomošč’ju zerkal razdvigajustja steny,* ***u-množaetsja*** *količestvo svetil’nikov*. [Marija Maganova. Čary zazerkal’ja (2004) // «Homes & Gardens», 2004.12.01]

‘After all the use of mirrors extends one’s home, with the help of mirrors the walls move apart and the number of lamps **is multiplied**.’

If we assume, however, that the meanings of the prefix and the simplex verb overlap and that the meaning of the simplex verb is narrowed and focused by the prefix in the formation of the Natural Perfective, there can be slight differences in meaning between the simplex verb and its Natural Perfective. Under these circumstances it would make sense to form secondary imperfectives that emphasize the meaning specific to the Natural Perfective and make it possible to express that meaning with an imperfective verb.

Previous studies have presented triplets as a restricted phenomenon, usually acknowledging only forty or fewer triplets (cf. Xrakovskij 2005, Jasai 2001, Apresjan 1995, Zaliznjak & Mikaelian 2010). We have taken a different approach: we formed hypothetical secondary imperfectives for all 1,981 Natural Perfectives listed in the Exploring Emptiness database and conducted searches for them in both the RNC and the Google search engine. 733 (37%) of the 1,981 possible secondary imperfectives are attested in the RNC, and 1,536 (77%) of the possible secondary perfectives were found in Google.

Clearly Russians use secondary imperfectives of Natural Perfectives, even though most of these are not acknowledged in dictionaries. Native speakers must also know what these secondary imperfectives mean and have strategies for how to use them in contrast with the corresponding simplex verbs. We turn now to the meaning of the secondary imperfectives and their use.

Unlike other previous scholars who have examined aspectual triplets, Veyrenc (1980) suggested that secondary imperfectives are motivated by a unified meaning, giving particular emphasis to the result of the action. We find evidence in support of this suggestion, because verbs that focus on tangible, intentional, or controllable results favor the use of the secondary imperfective.

Wherever aspectual triplets exist, there are two forms -- the simplex imperfective and the secondary imperfective -- that compete as the imperfective partner verbs for the Natural Perfective. For some Natural Perfectives the simplex is the most common choice, for others the secondary imperfective predominates, and sometimes both forms are chosen with nearly equal frequency. Table 6 presents a sample of how this choice is made across a variety of verbs.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Natural Perfective | prefix meaning | simplex imperfective | use | secondary imperfective | use | total # in RNC |
| *vy-rugat’* ‘curse’ | negative exhaustion | *rugat’* | 99.99% | *vy-rug-ivat’* | 0.01% | 7,193 |
| *vz-volnovat’sja* ‘get excited’ | agitate | *volnovat’sja* | 99.97% | *vz-volnov-yvat’sja* | 0.03% | 7,763 |
| *ras-tajat’* ‘melt’ | soften /dissolve | *tajat’* | 99.34% | *ras-taj-ivat’* | 0.66% | 3,465 |
| *o-šalet’* ‘go crazy’ | acquire a new feature | *šalet’* | 87.76% | *o-šale-vat’* | 12.24% | 98 |
| *za-žarit’* ‘fry’ | change to a fixed state | *žarit’* | 84.13% | *za-žar-ivat’* | 15.87% | 1,821 |
| *u-bajukat’* ‘lul to sleep’ | control | *bajukat’* | 41.85% | *u-bajuk-ivat’* | 58.15% | 454 |
| *za-žmurit’* ‘squint’ | cover | *žmurit’* | 37.30% | *za-žmur-ivat’* | 62.70% | 984 |
| *o-svjatit’* ‘bless, sanctify’ | impose a new feature | *svjatit’* | 20.00% | *o-svjašč-at’* | 80.00% | 130 |
| *za-molknut’* | change to a fixed state | *molknut’* | 0.71% | *za-molk-at’* | 99.29% | 1,692 |

Table 6: Competition between simplex imperfectives and secondary imperfectives in aspectual triplets

Each row in Table 6 corresponds to an aspectual triplet for which all three verbs are attested in the RNC. The leftmost columns list the Natural Perfective, followed by the meaning of the prefix in the Natural Perfective. The next four columns represent the competition between the simplex imperfective and the secondary imperfective citing the percentage of use for each. The final column lists the total number of imperfective uses for the triplet found in the RNC. The rows representing triplets are arranged according to the balance between the use of simplex imperfectives and secondary imperfectives, with triplets most preferring simplex verbs on the top and those most preferring secondary imperfectives on the bottom.

We can explore the differences in use among triplets where the two imperfectives are both well represented, such as those headed by the Natural Perfectives *u-bajukat’* ‘lull to sleep’ and *za-žmurit’* ‘squint’. Examples (5) and (7) show the use of the simplex imperfectives *bajukat’* and *žmurit’*; examples (6) and (8) illustrate the use of the corresponding secondary imperfectives *u-bajuk-ivat’* and *za-žmur-ivat’*.

(5) *Devočka kaprizničala i trebovala, čtoby vmesto babuški ee* ***bajukal*** *Dimka.* [Mark Sergeev. Volšebnaja galoša, ili Neobyknovennye priključenija Vadima Smirnova, ego lučšego druga Paši Kaškina i 33 nevidimok iz 117-j školy (1971)]

‘The girl made a fuss and demanded that Dimka **lull** her instead of her grandmother.’

(6) *Dnem Gusja* ***u-bajuk-ivala*** *doč’ pod odnu i tu že pesenku...* [Tanja Marčant. Kvartiranty (2003) // «Lebed’» (Boston), 2003.10.12]

‘During the day Gusja **lulled** her daughter **to sleep** with one and the same song..’

(7) *On [kot] sidel u nožki stola i* ***žmuril*** *zelenye svoi glaza.* [Jurij Družkov (Postnikov). Volšebnaja škola (1984)]

‘It [the cat] sat by the leg of the table and **squinted** its green eyes.’

(8) *On mne rasskazyval, čto on mal’čiškoj idja domoj s trenirovki,* ***za-žmur-ival*** *glaza, pročodja mimo kioska s moroženym.* [Tat’jana Tarasova, Vitalij Melik-Karamov. Krasavica i čudovišče (1984-2001)]

‘He told me that when he was walking home from training as a young boy, he **would squint** his eyes when he passed by the ice-cream stand.’

These examples support Veyrenc’s (1980) suggestion that the secondary imperfectives focus on the result of the action. In addition, we find that the secondary imperfectives are more likely to refer to an action that is not only concluded, but repeated. In (5) with the simplex verb the girl is only interested in who will rock her, not in the result. By contrast, in (6) with the secondary imperfective, lulling her daughter to sleep is something that Gusja does successfully and repeatedly during the daytime, always with the same song. In (7) with the simplex verb, squinty eyes merely describe the cat. Example (8) with the secondary imperfective is part of a larger narrative: the boy was always hungry after sports practice, but he knew that his parents were poor, so he squinted his eyes as he went by the ice-cream stand in order to avoid temptation.

These examples illustrate a trend in the distribution of the two imperfectives of an aspectual triplet. The simplex imperfective tends to describe an event where the focus is not on the result. The secondary imperfective tends to describe something that creates a result, often an intentional one, in a predictable repeated pattern. The meanings of the prefixes are decisive. Prefix meanings listed at the top of Table 6 do not indicate concrete results that can be intentionally repeated, but the prefixal meanings become more and more compatible with this pattern the lower in the table.

Our comprehensive corpus-based analysis of aspectual triplets in Russian supports the Verb Classifier Hypothesis. The use of secondary imperfectives is neither uniform nor random: some triplets feature nearly exclusive use of the simplex verb, some favor the secondary imperfective, and others show a more balanced relative frequency. The choice of simplex vs. secondary imperfective appears to be governed by the meanings of the prefixes. Secondary imperfectives are preferred when the meaning of the prefix motivates focus on a result, preferably produced intentionally and/or repeatedly. Prefix meanings that are less compatible with this meaning of secondary imperfectives reduce or exclude the use of secondary imperfectives.

9. Conclusion

I argue that the Russian verbal prefixes that form Natural Perfectives constitute an aspectual classifier system. I present various kinds of evidence to support the Verb Classifier Hypothesis. These include comparisons between numeral classifier systems and Russian verbal prefixes, distributional facts, and behavioral patterns.

There are strong parallels between the use of numeral classifiers and Russian perfectivizing prefixes: both numeral classifiers and aspectual prefixes are associated with quantification; and whereas numeral classifiers sort unbounded substances into objects according to shape, verbal prefixes sort unbounded states and activities into events according to their spatiotemporal contours. The description of Russian verbal prefixes as a classifier system comports well with a metaphorical description of Russian aspect, according to which imperfective verbs have the properties of metaphorical substances and perfective verbs have the properties of metaphorical objects.

Russian verbal prefixes meet the distributional criteria of a classifier system, with a much larger number of classifieds (= verbs) than classifiers (= prefixes), and significantly different groups of classifieds associated with the various classifiers.

Five different studies give evidence that the prefixes show different behaviors, as expected for a classifier system. The radial category profiling and semantic profiling studies show that each of the sixteen prefixes is associated with a different set of simplex verbs, and that the motive for this classification is semantic: the meanings of the prefixes overlap with the meanings of the simplex verbs. The constructional profile study shows that different prefixes have different behaviors in terms of the grammatical constructions they attract. Prefix variation is also consistent with what we find in classifier systems and the patterns of variation are motivated by the meanings of the prefixes. Lastly, the study of aspectual triplets shows differences in the behaviors of prefixes, since some prefixes are more frequently associated with the formation of secondary imperfectives than others, and again this behavior is linked to the meanings of the prefixes.

By embracing the hypothesis that Russian prefixes are aspectual classifiers, we gain cross-linguistic support for the proposal that the prefixes are not “empty”, but instead overlap with the meanings of the verbs. The comparison with numeral classifier systems gives us an important insight into the Russian aspectual classifier system: its purpose is to convert amorphous states and activities into discrete events and to sort these into meaningful groups.

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2. For a comprehensive exposition of this study, see Endresen et al. forthcoming. [↑](#footnote-ref-2)
3. For a comprehensive exposition of this study, see Janda and Lyashevskaya forthcoming. [↑](#footnote-ref-3)
4. For a comprehensive exposition of this study, see Sokolova et al. forthcoming. [↑](#footnote-ref-4)
5. For the active forms: chi-square = 293.3285, degrees of freedom = 3, p-value < 2.2e-16, effect size (Cramer’s V) = 0.6. [↑](#footnote-ref-5)
6. For a comprehensive exposition of this study, see Janda and Lyashevskaya 2011. [↑](#footnote-ref-6)