

## Two ways to get out: Radial Category Profiling and the Russian prefixes *vy-* and *iz-*

### Summary

We undertake a detailed analysis of the two closely related Russian aspectual prefixes *vy-* and *iz-*. The meanings of these prefixes are analyzed in terms of networks of related subcategories, termed radial categories. This method facilitates precise comparison of submeanings and statistical analysis. Our analysis sharpens the traditional insight that elements of Church Slavic origin like *iz-* have a more abstract meaning than historically East Slavic elements like *vy-*. Furthermore, the distribution of meanings attested gives support to the hypothesis that the meanings of base verbs and prefixes overlap in the formation of prefixed aspectual partner verbs, contra the tradition of the so-called “empty prefix”.

### 1. *Data: Two prefixes, two types of perfective verbs*

Pivotal in the notoriously complex Russian aspectual system is the distinction between perfective and imperfective verbs. Morphologically, perfective (pf) and imperfective (ipf) verbs can be related in three ways: via suffixation (e.g. *perepisat'* ‘rewrite (pf)’ – *perepisyvat'* (ipf) ‘rewrite’), suppletion (e.g. *položit'* ‘lay (pf)’ – *klast'* ‘lay (ipf)’) and prefixation (e.g. *napisat'* – ‘write (pf)’ – *pisat'* ‘write (ipf)’). In this study, we are interested in prefixation. Russian has nineteen aspectual prefixes<sup>1</sup> that form perfective verbs by adding a prefix to a simplex imperfective. We focus on the two closely related prefixes *vy-* and *iz-*. As shown in (1) and (2), both prefixes are used to form perfective verbs from the imperfective *ryt'* ‘dig’:<sup>2</sup>

- (1) *Kolja prines saženec, a Pavel Nikolaevič bystro i dostatočno lovko vyryl jamu.* (TARANOV 2001)  
‘Kolja brought the seedling, and Pavel Nikolaevič quickly and rather deftly **dig** a hole.’
- (2) *Dvor kurenevskoj policii izryli tranšejami i vystroili moščnyj dot ambrazurami na ulicu.* (KUZNECOV 1965-1970)  
‘They **completely dig up** the yard of the local police station with trenches and built a mighty reinforced concrete firing position with gun slits aimed at the street.’

A central notion in the Russian aspectual system is the “aspectual pair” consisting of a perfective and a corresponding imperfective verb. In an aspectual pair the perfective verb can be replaced by the imperfective verb in contexts such as the historical present or gnomic uses where the perfective aspect is not allowed (“Maslov’s criterion”<sup>3</sup>). According to Maslov’s criterion, *vyryt'* ‘dig (pf)’ and *ryt'* ‘dig (ipf)’ constitute an aspectual pair. If you want to describe the digging of holes in the historical or gnomic present, you may replace *vyryt'* as in (1) with the imperfective *ryt'* as in (3).

- (3) *No na kladbiščax rojut jamy tol'ko standartnoj glubiny!* (MATEVOSJAN 2004)  
‘But at the cemeteries they only **dig** holes of a standard depth!’

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<sup>1</sup> KRONGAUZ (1998: 111).

<sup>2</sup> Numbered examples are from the Russian National Corpus available at [www.ruscorpora.ru](http://www.ruscorpora.ru). For all examples, we provide the name of the author and the year of publication. For the readers’ convenience, we boldface the verb of interest in each example.

<sup>3</sup> ZALIZNJAK & ŠMELEV (2000: 47).

Janda<sup>4</sup> coined the term “natural perfective” for prefixed perfective verbs like *vyryt* ‘that form aspectual pairs with simplex imperfectives. This terminology is adopted here.

Natural perfectives are not semantically distinct from their imperfective partners; that is why the imperfective verb can replace the perfective partner in contexts where the imperfective aspect is required. Note that both the collocational properties and the grammatical constructions are often preserved in the formation of natural perfectives. Both the imperfective *ryt* ‘dig’ in (3) and the perfective *vyryt* ‘dig’ in (1) collocate with *jama* ‘hole’ which appears as the accusative-marked direct object.

However, in many cases a prefixed perfective verb is semantically distinct from the corresponding simplex imperfective. A case in point is *izryt* ‘dig up (a surface)’ in (2). The prefix not only makes the verb perfective, but also adds a nuance of exhaustiveness to the verb; the yard in (2) is completely dug up. Note that the collocational and constructional properties are likewise different: in (2), it is the surface (not the hole) that is dug up and that appears as the accusative-marked direct object; the holes (trenches) appear as instrumental-marked adjuncts. Janda<sup>5</sup> refers to prefixed perfectives that are semantically distinct from the corresponding simplex imperfective as “specialized perfectives”.

Examples like (1) and (2) show that we can form natural perfectives with *vy-* and specialized perfectives with *iz-*. However, there are also natural perfectives with *iz-* and specialized perfectives with *vy-*. For instance, *isportit* ‘spoil (pf)’ is the natural perfective corresponding to *portit* ‘spoil (ipf)’, while *vyjti* ‘walk out (pf)’ is a specialized perfective based on *idti* ‘walk (ipf)’.

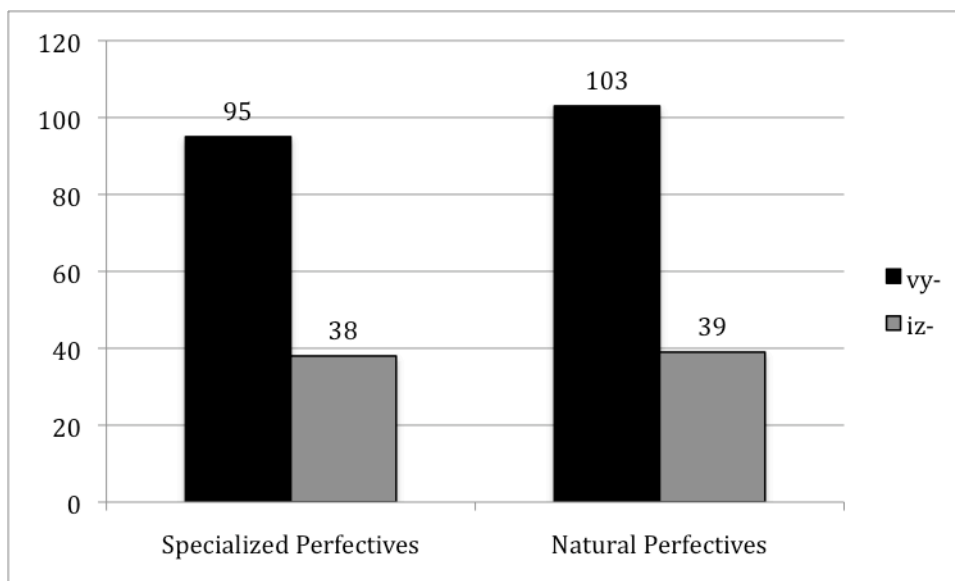
The upshot of this is that there are four types of verbs that we need to account for: natural and specialized perfectives with *vy-* and natural and specialized perfectives with *iz-*. In order to carry out a detailed analysis we have collected all the natural perfectives with the relevant prefixes attested in a large database constructed as part of the “Exploring Emptiness” research project at the University of Tromsø. This database contains all 1981 aspectual pairs (imperfective base verb and corresponding natural perfective), aggregated from three sources<sup>6</sup> and screened by a team of native speakers. Since the Exploring Emptiness database does not cover specialized perfectives, we excerpted all specialized perfectives with *vy-* and *iz-* from the Russian National Corpus. In order to create a representative database of a manageable size, we analyzed only specialized perfectives with a token frequency higher than 100 in the corpus. All in all, we have analyzed 275 verbs, distributed among the four types as shown in Figure 1.

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<sup>4</sup> JANDA (2007).

<sup>5</sup> JANDA (2007).

<sup>6</sup> CUBBERLY (1982), EVGEN’EVA (1999), OŽEGOV & ŠVEDOVA (2001).



**Figure 1: Natural and Specialized Perfectives with *vy-* and *iz-***

Why compare *vy-* and *iz-*? As will become clear in sections 2 through 5, the two prefixes have closely related meanings, which makes them a perfect test case for what we call “Radial Category Profiling” (see section 6). The history of the Russian language provides another reason for comparing *vy-* and *iz-*. The near-synonymy of the two prefixes stems from Church Slavic influence on the Russian language. The Russian standard language of today is the result of the complex interaction of South Slavic (Church Slavic) and East Slavic (Russian) elements<sup>7</sup>. Church Slavic influence is pervasive in lexicon and grammar. In the lexicon, numerous roots co-exist in both an East Slavic and a Church Slavic form, such as *golova* ‘head (body part)’ and *glava* ‘head (leader); chapter (of a book)’. In pairs of this type, it has often been pointed out that the Church Slavonicism has a more abstract meaning than its East Slavic counterpart<sup>8</sup>. While a thorough overview of Church Slavonicisms is beyond the scope of the present study, it is clear that Church Slavic influence has created many interesting cases of near-synonymy. One of the frequently cited Church Slavonicisms in word-formation is the use of *iz-* as a verbal prefix<sup>9</sup>. According to Shevelov<sup>10</sup>, Dobrovský and Vostokov mention the relationship between *vy-* and *iz-* in works from the early 19<sup>th</sup> century. In his authoritative etymological dictionary, Vasmer states that “[T]he prefix *iz-* appears not infrequently in Church Slavic words as the counterpart of the popular Russian *vy-*”<sup>11</sup>. Two dissertations from the Soviet period track the use of these prefixes from Old Russian through the eighteenth century, finding that some meanings of *iz-* (particularly exhaustiveness) cannot be attributed to Old Church

<sup>7</sup> SHEVELOV (1960), USPENSKIJ (2002: 23ff., 75ff.).

<sup>8</sup> See SHEVELOV (1960: 58) for critical discussion.

<sup>9</sup> TOWNSEND (1975: 125), SUSSEX & CUBBERLEY (2006:50), USPENSKIJ (2002: 253).

<sup>10</sup> SHEVELOV (1960: 49).

<sup>11</sup> VASMER (1976: 473). The German original from Vasmer reads: “[D]as Präfix *iz-* erscheint nicht selten in kircheslavischen Wörtern als Entsprechung des volkstümlichen russischen *vy-*”. See also ČERNÝX (1993: 173).

Slavic borrowing<sup>12</sup>, and that the Church Slavic spatial meanings of *iz-* have largely been transferred to *vy-* in Russian<sup>13</sup>. Our study focuses on the synchronic relationship between *vy-* and *iz-*, using the framework of cognitive linguistics to probe this long-standing issue in Russian linguistics.

In the following four sections (2-5) we propose radial categories for the specialized and natural perfectives formed with *vy-* and *iz-*. Section 6 uses this data to perform a comparative analysis, called Radial Category Profiling. The contribution of the article is summarized in section 7.

## **2. Radial category: *vy-* in specialized perfectives**

We propose modeling the meanings of *vy-* and *iz-* as radial categories, i.e. networks of related subcategories organized around a prototype. Unlike classical, Aristotelian categories, a radial category is not defined in terms of a set of necessary and sufficient conditions. Rather, a radial category is a structured relationship between a prototype and other subcategories that bear a family resemblance to the prototype<sup>14</sup>. In a radial category, all subcategories are motivated directly or indirectly by the prototype, but there need not be any one characteristic that all of them share. The prototype is a semantically central subcategory that serves to motivate extensions to other subcategories via cognitive mechanisms such as metaphor and metonymy. Furthermore, the prototype tends to belong to the physical domain and is normally connected to more subcategories than any other. It is important to notice that the subcategories within a network are not necessarily discrete, nor must any given example fit into one and only one subcategory. Instead, the subcategories serve as salient nodes in a web of interrelated meanings where any given item may be motivated by multiple subcategories.

We do not exclude the possibility of finding an invariant meaning for each of the Russian prefixes<sup>15</sup>. However, such invariant meanings would necessarily be quite abstract, and not suitable for the purposes of this paper, where we wish to provide detailed comparisons of the various uses of *vy-* and *iz-*<sup>16</sup>. Consider the network in Figure 2, which concerns *vy-* in specialized perfectives. Each subcategory is labeled with a number and a heading, which correspond to the groups of verbs listed in Table 1 below. The first subcategory, OUT OF A CONTAINER, is the prototype, which for the convenience of the reader is given in a rectangular box.<sup>17</sup> The links that join the rectangle and ovals indicate extension relations among subcategories. All the subcategories and the links are described in the text following Table 1.

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<sup>12</sup> BELOZERCEV (1966).

<sup>13</sup> DADAVAEVA (1978).

<sup>14</sup> LAKOFF (1987), GEERAERTS (1995), CROFT & CRUSE (2004), LEWANDOWSKA-TOMASZCZYK (2007).

<sup>15</sup> KRONGAUZ & PAILLARD (1997).

<sup>16</sup> See WIERZBICKA (1980) for discussion of problems with invariant meanings.

<sup>17</sup> We use “container” as shorthand for the CONTAINER/CONTAINMENT image schema discussed inter alia in LAKOFF (1987) and HAMPE (2005).

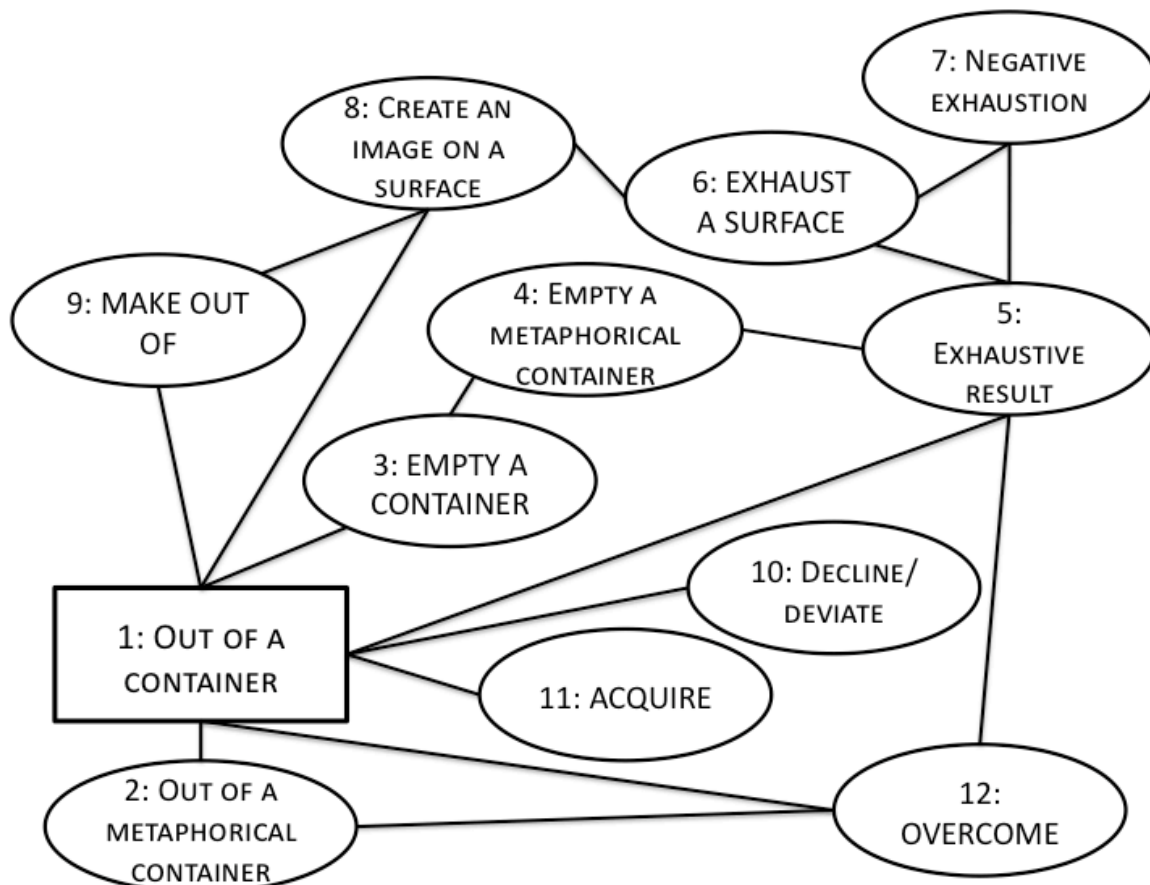


Figure 2: Radial Category Network for *vy-* in Specialized Perfectives

In Table 1 we offer a classification of the *vy-*prefixed specialized perfectives in our database. Notice that each verb takes up four columns across a whole line. The first two columns provide the specialized perfective and a gloss, while the base verb and its gloss are given in the two remaining columns. Some polysemous verbs appear more than once in the table. For example, *vylovit'* appears in both subcategory 1: OUT OF A CONTAINER where it denotes the removal of one or more items, and in subcategory 3: EMPTY A CONTAINER where it denotes the removal of all items. *Vygovorit'(sja)* is listed in subcategory 1: OUT OF A CONTAINER with the meaning 'articulate', in subcategory 4: EMPTY A METAPHORICAL CONTAINER with the meaning 'say all that is on one's mind', and in subcategory 11: ACQUIRE with the specialized legal meaning 'reserve (the right to something)'. Though nearly all verbs are polysemous, most verbs appear only once, so a certain amount of detail has been suppressed in this analysis. Notice that we do not give separate entries for so-called reflexive verbs in *-sja* in the table, since a discussion of the semantic contribution of this morpheme is beyond the scope of the present article.<sup>18</sup>

<sup>18</sup> Note also that *(sja)* in parentheses appears where both *-sja* and non-*sja* forms of a verb exist without any semantic shift; where *sja* appears without parentheses, either the verb is always reflexive or the reflexive verb differs semantically from its non-reflexive counterpart.

**Subcategory 1: OUT OF A CONTAINER**

<i>vybežat'</i>	'run out'	<i>bežat'</i>	'run'
<i>vybit'(sja)</i>	'knock out; beat out'	<i>bit'</i>	'beat'
<i>vybrat'</i>	'select, pick out'	<i>brat'</i>	'take'
<i>vybyt'</i>	'quit, leave'	<i>byt'</i>	'be'
<i>vyvezti</i>	'take out, remove, export'	<i>vezti</i>	'cart, convey'
<i>vyvesti</i>	'lead out, bring out'	<i>vesti</i>	'lead'
<i>vyvoloč'</i>	'drag out'	<i>voloč'</i>	'drag'
<i>vygovorit'</i>	'articulate, speak'	<i>govorit'</i>	'speak'
<i>vygresti</i>	'rake out; row out'	<i>gresti</i>	'rake'
<i>vygruzit'</i>	'unload'	<i>gruzit'</i>	'load'
<i>vydavit'</i>	'press out, squeeze out'	<i>davit'</i>	'press'
<i>vydelit'(sja)</i>	'single out'	<i>delit'</i>	'divide; share with'
<i>vyexat'</i>	'drive out'	<i>exat'</i>	'drive'
<i>vyžit'</i>	'hound out, force to leave'	<i>žit'</i>	'live'
<i>vyzvat'(sja)</i>	'call out, send for'	<i>zvat'</i>	'call'
<i>vyjti</i>	'walk out'	<i>idti</i>	'walk'
<i>vykarabkat'sja</i>	'get out'	<i>karabkat'sja</i>	'climb'
<i>vykatit'(sja)</i>	'roll out'	<i>katit'(sja)</i>	'roll'
<i>vykrast'</i>	'steal out of'	<i>krast'</i>	'steal'
<i>vykrutit'(sja)</i>	'unscrew'	<i>krutit'</i>	'screw'
<i>vykurit'</i>	'smoke out'	<i>kurit'</i>	'smoke'
<i>vyletet'</i>	'fly out'	<i>letet'</i>	'fly'
<i>vylit'(sja)</i>	'pour out'	<i>lit'(sja)</i>	'flow, stream'
<i>vylovit'</i>	'fish out (one or several)'	<i>lovit'</i>	'try to catch'
<i>vyломat'</i>	'break open, break off'	<i>lomat'</i>	'break'
<i>vymanit'</i>	'swindle out of'	<i>manit'</i>	'attract, lure'
<i>vynesti</i>	'carry out'	<i>nesti</i>	'carry'
<i>vyperet'</i>	'push out'	<i>peret'</i>	'push, make one's way'
<i>vypisat'(sja)</i>	'copy out, excerpt; order, send for; send home from hospital'	<i>pisat'</i>	'write'
<i>vyplatit'</i>	'pay out, pay off'	<i>platit'</i>	'pay'
<i>vyplyt'</i>	'swim out'	<i>plyt'</i>	'swim'
<i>vypolzti</i>	'crawl out'	<i>polzti</i>	'crawl'
<i>vyputat'(sja)</i>	'disentangle'	<i>putat'(sja)</i>	'tangle'
<i>vyrvat'sja</i>	'break loose from; come out'	<i>rvat'sja</i>	'strain, burst'
<i>vyrezat'</i>	'cut out; carve'	<i>rezat'</i>	'cut'
<i>vysadit'(sja)</i>	'(make) get off'	<i>sadit'</i>	'make sb sit; plant'
<i>vyselit'</i>	'evict, force to move out'	<i>selit'</i>	'settle'
<i>vyslat'</i>	'send out; exile, deport'	<i>slat'</i>	'send'
<i>vysledit'</i>	'track down'	<i>sledit'</i>	'track, follow'
<i>vystavit'</i>	'bring out, display'	<i>stavit'</i>	'put, place, set'
<i>vysypat'</i>	'break out (of a rash)'	<i>sypat'</i>	'pour, spill'
<i>vytesnit'</i>	'crowd out, force out'	<i>tesnit'</i>	'crowd, squeeze'
<i>vytolkat'</i>	'push out'	<i>tolkat'</i>	'push'
<i>vyčlenit'</i>	'detach one part of'	<i>členit'</i>	'divide into parts'

**Subcategory 2: OUT OF A METAPHORICAL CONTAINER**

<i>vyverit'</i>	'adjust, regulate (of clocks)'	<i>verit'</i>	'believe'
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<i>vyvesti</i>	‘bring out (of mental state)’	<i>vesti</i>	‘lead’
<i>vydumat’</i>	‘invent, make up’	<i>dumat’</i>	‘think’
<i>vyzdorovet’</i>	‘recover’	<i>zdorovet’</i>	‘become stronger, bigger’
<i>vykrutit’ sja</i>	‘get oneself out of a trouble’	<i>krutit’ sja</i>	‘whirl, spin’
<i>vysvetit’</i>	‘put spotlight on’	<i>svetit’</i>	‘light’
<i>vysmotret’</i>	‘spy out’	<i>smotret’</i>	‘look at’
<i>vyxodit’</i>	‘tend, nurse, bring up’	<i>xodit’</i>	‘walk’
<i>vyčitat’</i>	‘find (by reading)’	<i>čitat’</i>	‘read’

### Subcategory 3: EMPTY A CONTAINER

<i>vyvalit’</i>	‘throw out, fall out’	<i>valit’</i>	‘throw, fall’
<i>vysypat’</i>	‘pour out, empty out’	<i>sypat’</i>	‘pour, spill’
<i>vyteč’</i>	‘flow out’	<i>teč’</i>	‘flow’
<i>vykolot’</i>	‘put out someone’s eyes’	<i>kolot’</i>	‘stab, prick’
<i>vylovit’</i>	‘catch all the fish’	<i>lovit’</i>	‘try to catch’
<i>vycarapat’</i>	‘scratch out’	<i>carapat’</i>	‘scratch’

### Subcategory 4: EMPTY A METAPHORICAL CONTAINER

<i>vygovorit’ sja</i>	‘say all that is on one’s mind’	<i>govorit’</i>	‘speak’
<i>vymučit’</i>	‘extort from, force out of’	<i>mučit’</i>	‘torment’

### Subcategory 5: EXHAUSTIVE RESULT

<i>vybrit’</i>	‘shave completely’	<i>brit’</i>	‘shave’
<i>vykurit’</i>	‘smoke up a cigarette’	<i>kurit’</i>	‘smoke’
<i>vyspat’ sja</i>	‘get a good night’s sleep’	<i>spat’</i>	‘sleep’

### Subcategory 6: EXHAUST A SURFACE

<i>vylizat’</i>	‘lick clean, lick up’	<i>lizat’</i>	‘lick’
<i>vytoptat’</i>	‘trample down’	<i>toptat’</i>	‘trample’
<i>vyteret’</i>	‘wipe up, rub dry’	<i>teret’</i>	‘rub’

### Subcategory 7: NEGATIVE EXHAUSTION

<i>vygoret’</i>	‘fade (of colors)’	<i>goret’</i>	‘burn’
<i>vyest’</i>	‘eat away, corrode’	<i>est’</i>	‘eat’
<i>vyžeč’</i>	‘burn down, burn out’	<i>žeč’</i>	‘burn’
<i>vymeret’</i>	‘die out; become deserted’	<i>meret’</i>	‘die (in large numbers)’
<i>vyrezat’</i>	‘butcher, massacre’	<i>rezat’</i>	‘kill, slaughter’
<i>vyrubit’</i>	‘cut down, fell trees’	<i>rubit’</i>	‘fell trees’
<i>vyteret’</i>	‘wear out, wear threadbare’	<i>teret’</i>	‘rub’
<i>vycvesti</i>	‘fade’	<i>cvesti</i>	‘blossom’

### Subcategory 8: CREATE AN IMAGE ON A SURFACE

<i>vyšit’</i>	‘embroider a pattern’	<i>šit’</i>	‘sew’
<i>vyžeč’</i>	‘make a mark by burning’	<i>žeč’</i>	‘burn’

### Subcategory 9: MAKE OUT OF

<i>vyrabotat’</i>	‘work out (plan), manufacture’	<i>rabotat’</i>	‘work’
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### Subcategory 10: DECLINE/DEVIATE

<i>vygnut’ (sja)</i>	‘curve, arch’	<i>gnut’ (sja)</i>	‘bend’
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**Subcategory 11: ACQUIRE**

<i>vygovorit'</i>	'reserve (the right to something)'	<i>govorit'</i>	'speak, talk'
<i>vyigrat'</i>	'win'	<i>igrat'</i>	'play'
<i>vyprosit'</i>	'obtain by asking, begging'	<i>prosit'</i>	'ask'
<i>vystradat'</i>	'achieve through suffering'	<i>stradat'</i>	'suffer'
<i>vymenjat'</i>	'receive in exchange, barter'	<i>menjat'</i>	'exchange'
<i>vyvedat'</i>	'worm a secret out of'	<i>vedat'</i>	'know'
<i>vyxlopotat'</i>	'obtain after much trouble'	<i>xlopotat'</i>	'make efforts, take trouble'
<i>vynudit'</i>	'extort'	<i>nudit'</i>	'force, compel'

**Subcategory 12: OVERCOME**

<i>vyderžat'</i>	'stand (up to), endure'	<i>deržat'</i>	'hold'
<i>vyždat'</i>	'wait for the right time to go, bide one's time'	<i>ždat'</i>	'wait'
<i>vyžit'</i>	'survive, live through'	<i>žit'</i>	'live'
<i>vynesti</i>	'bear (fig.), stand, endure'	<i>nesti</i>	'carry'
<i>vynosit'</i>	'bring forth a child at full term'	<i>nosit'</i>	'carry'
<i>vystojat'</i>	'stand one's ground'	<i>stojat'</i>	'stand'
<i>vystradat'</i>	'suffer, go through'	<i>stradat'</i>	'suffer'
<i>vyterpet'</i>	'bear, endure'	<i>terpet'</i>	'suffer'

**Table 1: Prefix *vy-* in Specialized Perfectives****Subcategory 1: OUT OF A CONTAINER**

Like prepositions, Russian prefixes denote a relationship between two entities that are referred to as “trajector” and “landmark” in cognitive linguistics<sup>19</sup>. In the *vy*-prefixed verbs in subcategory 1, the trajector moves out of the landmark, which is typically a three-dimensional space (“a container”). By way of example, consider *vyjti* ‘walk out’. In the following sentence, *on* ‘he’ (the trajector) leaves the three-dimensional landmark *komnata* ‘room’, which follows the preposition *iz* ‘out of’:

- (4) *On vyšel iz komnaty.* (ARXIPOVA 1996)  
 ‘He walked out of the room.’

Notice that the meaning of movement “out of” is contributed by the prefix. The base verb *idti* ‘walk’ specifies that the subject walks in one direction, but does not say anything about leaving a three-dimensional space. The prefixed *vyjti* ‘walk out’, on the other hand, describes movement out, even if we omit the prepositional phrase with *iz* in sentences like (4).

**Subcategory 2: OUT OF A METAPHORICAL CONTAINER**

Subcategory 2 is metaphorically related to subcategory 1. While in (4) there is physical motion out of the landmark, verbs like *vydumat'* ‘invent, make up’ and *vyzdorovet'* ‘recover’ do not involve physical motion. However, metaphorically speaking, an idea “moves” out of the mind in *vydumat'*, while in the case of *vyzdorovet'* a person “moves” out of the state of illness. By “metaphor” we understand a mapping relation across

<sup>19</sup> LANGACKER (1987: 217ff. and 2008: 70ff.).



domains<sup>20</sup>; through metaphor, coming up with an idea and recovery from illness are conceptualized in terms of motion. In examples *vysvetit* ‘put a spotlight on’, *vysmotret* ‘spy out’ and *vyčítat* ‘find by reading’ the “movement” is fictive since the trajector does not physically move, but is “picked out” from an initial state in which it was not perceptually available.

Subcategories 3: EMPTY A CONTAINER and 4: EMPTY A METAPHORICAL CONTAINER

Subcategories 3 and 4 also involve movement out of the landmark, but in addition there is an implication that the landmark is emptied as a result of the action. This implication holds even if no quantifier (e.g. *ves* ‘all’) is present. *Vysypat* ‘pour out, empty out’ in subcategory 3, for instance, implies that everything inside the landmark is poured out, so that nothing is left after the completion of the action. While in subcategory 3 we are dealing with physical motion, verbs like *vygovorit’sja* ‘say all that is on one’s mind’ in subcategory 4 involve metaphorical movement. In *vygovorit’sja*, the speaker gets to speak his piece, and as a result the metaphorical container (the mind) is emptied.

Subcategories 5: EXHAUSTIVE RESULT, 6: EXHAUST A SURFACE, 7: NEGATIVE EXHAUSTION

Subcategories 5, 6 and 7 form a cluster of closely related meanings involving exhaustiveness of the action. A short metaphorical step takes us from emptying a container to carrying out an action exhaustively. However, the verbs in subcategories 5 through 7 also occur in a different syntactic construction, which reflects a semantic difference. While verbs in subcategories 1 through 4 typically combine with the preposition *iz* ‘out of’ followed by the landmark (cf. e.g. (4) above), subcategories 5 through 7 do not typically allow this construction, since they usually mark the landmark as the direct object. By way of illustration, consider *vylizat* ‘lick clean, lick up’:

(5) *Glebov netoroplivo vylizal misku.* (ŠALAMOV 1954-1961)

‘Glebov unhurriedly licked the bowl clean.’

Arguably *miska* ‘bowl’ is the landmark, which the remainder of the food (the trajector) moves out of<sup>21</sup>. In any case, the focus is not on the movement of the food, but rather on the change of state of the bowl, which becomes empty and therefore clean. By backgrounding movement and foregrounding change of state, subcategories 5 through 7 receive a more abstract meaning than subcategories 1 through 4. In subcategory 6 we single out actions which apply to surfaces, while subcategory 7 includes verbs with negative connotations such as *vyrezat* ‘butcher, massacre’.

Subcategory 8: CREATE AN IMAGE ON A SURFACE

Subcategory 8 contains actions that apply to surfaces and is therefore related to subcategory 6. However, the focus is not on exhaustiveness, but rather on an image appearing on the surface. In *vyšit* ‘embroider a pattern’, for instance, the emphasis is on

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<sup>20</sup> LAKOFF (1993: 203).

<sup>21</sup> One could also argue that the bowl stands metonymically for its contents (the trajector that moves out of the landmark), so in this sense the construction without the preposition *iz* conflates the landmark and the trajector. Note that it is marginally possible to use the *iz* construction with verbs in subcategories 5 through 7, but the direct object construction predominates.

the pattern that emerges as the result of the action, as in (6). Here we see a link to verbs like *vyjti* ‘walk out’ in subcategory 1, illustrated in (7):

(6) *A na rubaške on **vyšil** ... prelestnuju malen'kuju myšku.* (LIMONOV 1985)

‘And on the shirt he **embroidered** ... a darling little mouse.’

(7) *Spivakov posle ètogo **vyšel** igrat' koncert Mocarta, i ja čuvstvovala, kak u nego ot jarosti drožit smyčok.* (SPIVAKOVA 2002)

‘After that Spivakov **stepped out** to play Mozart’s concerto, and I felt how his bow was quivering with fury.’

Parallel to the way the violinist Spivakov becomes visible as he walks onto the stage in (7), in (6) a pattern becomes visible as the result of embroidery.

#### Subcategory 9: MAKE OUT OF

An extension of subcategory 8 is subcategory 9, which involves verbs for making something out of something, e.g. *vyrobotat* ‘manufacture’. Such verbs share the idea of appearance with the preceding subcategory, insofar as production implies that something becomes available. The difference between subcategories 8 and 9 is the fact that the notion of surface is relevant for 8, but not for 9.

#### Subcategory 10: DECLINE/DEVIATE

Subcategory 10 involves deviation from a norm or a normal position. By prefixing *vy-* to *gnut* ‘bend’ we get a verb that involves bending something into a tense, arch-shaped position. A case in point is the frequent collocation *vygnut' spinu* ‘stretch out, curve one’s back’, where the position of the back takes the shape of an arch. Subcategory 10 is an extension from the prototype, insofar as the trajector (e.g. the back) moves out of its normal position. In other words, change of position in subcategory 10 corresponds to movement out of the landmark in the prototypical subcategory 1.

#### Subcategory 11: ACQUIRE

Similar extensions from the prototype are found in subcategory 11. Consider *vyigrat* ‘win’, which is derived from *igrat* ‘play’. Winning a prize implies that the prize metaphorically speaking moves out and becomes available to the winner. In other words, we analyze subcategory 11 as a metaphorical extension from the prototypical subcategory 1. Recall from (7) that the prototypical *vy-*verb *vyjti* ‘walk out’ can describe movement towards an observer, whereby the trajector becomes visible and, hence, accessible to the observer.

#### Subcategory 12: OVERCOME

The final subcategory includes verbs that in some sense involve overcoming an obstacle. We analyze this as a metaphorical extension from the prototypical movement out of something. When you overcome something, metaphorically speaking you move out of one state and enter a new one. In the case of *vystradat* ‘suffer, go through’, for instance, you “go through” the suffering and “come out on the other side”.

To summarize this section, we have shown that ninety-five specialized perfectives with *vy-* in our database can be accommodated in a radial category including a prototype and eleven subcategories that are directly or indirectly connected to the prototype by means of

extension relations. In the following section, we turn to specialized perfectives with *iz-* and show that they can be analyzed in terms of the same set of subcategories.

### 3. Radial category: *iz-* in specialized perfectives

Specialized perfectives with *iz-* have a lower type frequency than the corresponding perfectives with *vy-*. Figure 3 depicts the radial category of *iz-* specialized perfectives. The figure shows that *vy-* and *iz-* can be modeled by the same radial category and that *iz-* occurs in a subset of the subcategories where *vy-* is attested. The subcategories where *iz-* is attested are given in solid lines, while dashed lines represent subcategories where *vy-*, but not *iz-* occurs in specialized perfectives. Table 2 groups the thirty-eight specialized perfectives prefixed in *iz-* found in our database.

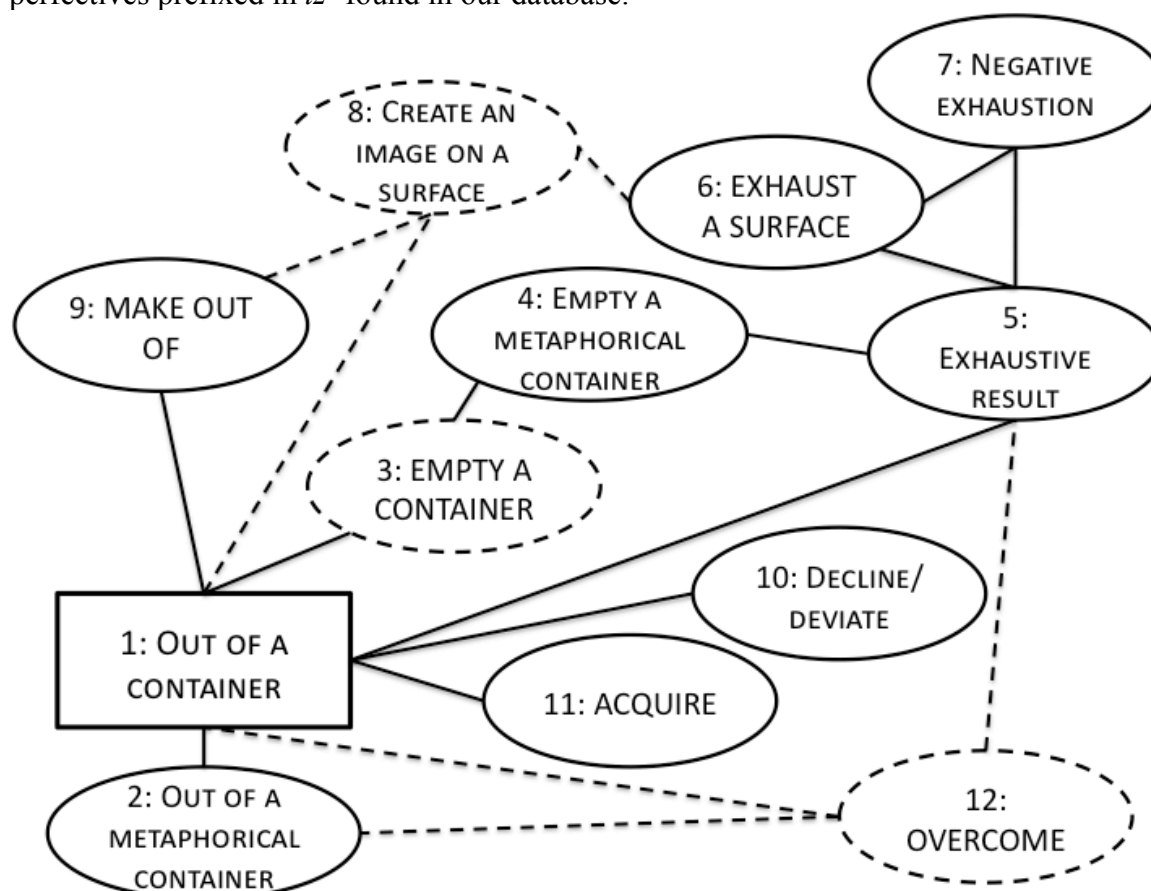


Figure 3: Radial Category Network for *iz-* in Specialized Perfectives

#### Subcategory 1: OUT OF A CONTAINER

<i>izbrat'</i>	'choose, select'	<i>brat'</i>	'take'
<i>izvleč'</i>	'extract, take out of'	<i>vleč'</i>	'draw, drag'
<i>izgnat'</i>	'exile, banish'	<i>gnat'</i>	'chase'
<i>izlovit'</i>	'catch out'	<i>lovit'</i>	'try to catch'
<i>izyskat'</i>	'find, search out'	<i>iskat'</i>	'search'
<i>ispit'</i>	'have a drink of'	<i>pit'</i>	'drink'

**Subcategory 2: OUT OF A METAPHORICAL CONTAINER**

<i>izbežat'</i>	'avoid'	<i>bežat'</i>	'run'
<i>izvinit'(sja)</i>	'excuse'	<i>vinit'</i>	'blame'
<i>izžit'</i>	'get rid of'	<i>žit'</i>	'live'
<i>ispravit'(sja)</i>	'correct'	<i>pravit'(sja)</i>	'correct'
<i>istolkovat'</i>	'interpret, comment on'	<i>tolkovat'</i>	'interpret'
<i>iscelit'</i>	'cure'	<i>celit'</i>	'give treatment'

**Subcategory 3: EMPTY A CONTAINER: Not attested****Subcategory 4: EMPTY A METAPHORICAL CONTAINER**

<i>izlit'</i>	'express'	<i>lit'</i>	'pour'
<i>isčepat'</i>	'run out of'	<i>čepat'</i>	'scoop, extract'
<i>izložit'</i>	'lay out, express'	<i>klast'</i>	'lay, put' <sup>22</sup>

**Subcategory 5: EXHAUSTIVE RESULT**

<i>izvedat'</i>	'experience, get to know'	<i>vedat'</i>	'know'
<i>izgotovit'sja</i>	'get prepared, ready'	<i>gotovit'sja</i>	'prepare'
<i>izorvat'</i>	'tear the whole thing into pieces'	<i>rvat'</i>	'tear'
<i>izučit'</i>	'learn a subject completely'	<i>učit'</i>	'learn, study'
<i>ispisat'</i>	'write all over, with no space or ink left'	<i>pisat'</i>	'write'
<i>isteč'</i>	'expire (of time)'	<i>teč'</i>	'float'
<i>istlet'</i>	'rot, decay, reduce to ashes'	<i>tlet'</i>	'rot, decay'

**Subcategory 6: EXHAUST A SURFACE**

<i>izryt'</i>	'dig up all over'	<i>ryt'</i>	'dig'
<i>istoptat'</i>	'trample all over'	<i>toptat'</i>	'trample'
<i>iscarapat'</i>	'scratch all over'	<i>carapat'</i>	'scratch'

**Subcategory 7: NEGATIVE EXHAUSTION**

<i>izbit'</i>	'beat up'	<i>bit'</i>	'beat'
<i>izvesti(s')</i>	'poison; waste; wear self out'	<i>vesti</i>	'lead'
<i>izmotat'</i>	'wear out, make exhausted'	<i>motat'</i>	'wind, reel'
<i>iznosit'</i>	'wear out'	<i>nosit'</i>	'carry, wear'
<i>izranit'</i>	'wound all over'	<i>ranit'</i>	'wound'
<i>iskusat'</i>	'bite all over'	<i>kusat'</i>	'bite'
<i>isterzat'</i>	'tear the whole thing to pieces'	<i>terzat'</i>	'torment, tear'

**Subcategory 8: CREATE AN IMAGE ON A SURFACE: Not attested****Subcategory 9: MAKE OUT OF**

<i>izvajat'</i>	'sculpt out of'	<i>vajat'</i>	'sculpt'
<i>izgotovit'</i>	'make out of'	<i>gotovit'</i>	'prepare'

**Subcategory 10: DECLINE/DEVIATE**

<i>izlovčit'sja</i>	'act cunningly once'	<i>lovčit'</i>	'act cunningly'
<i>izognut'(sja)</i>	'bend out, crook'	<i>gnut'</i>	'bend'

<sup>22</sup> This stem is suppletive. Instead of the normative *klast'*, *ložit'* occurs in substandard Russian (cf. e.g. SKVORCOV (2005: 5, 379)).

**Subcategory 11: ACQUIRE**

<i>isprosit'</i>	'acquire through asking'	<i>prosit'</i>	'ask, request'
<i>istrebovat'</i>	'claim, demand according to legal right'	<i>trebovat'</i>	'demand'

**Subcategory 12: OVERCOME: Not attested****Table 2: Prefix *iz-* in specialized perfectives**

## Subcategory 1: OUT OF A CONTAINER

In the previous section, we saw that the prefixation of *vy-* to a motion verb such as *idti* 'walk' yields a verb denoting movement out of a three-dimensional space (the landmark). This pattern is attested for *iz-* too. A comparison of *vygnat'* 'chase out' and *izgnat'* 'exile, banish', which are both derived from *gnat'* 'chase', is instructive. Both verbs indicate movement out of something, but while *vygnat'* is used in concrete settings such as chasing a cat out of a room in (8), *izgnat'* occurs in more abstract meanings such as (9):

- (8) *V sledujušćij raz vygonju košku v koridor.* (ULICKAJA 2000)  
'Next time, I will chase the cat out into the hallway.'
- (9) *Fašisty izgnali genial'nogo Ėjnštejna, i ix fizika stala fizikoj obez'jan.* (GROSSMAN 1960)  
'The Fascists expelled the genius Einstein, and their physics became the physics of monkeys.'

Clearly, in (9) Einstein moves out of Germany, but in addition the sentence with the *iz-* verb focuses on his loss of citizenship.

## Subcategory 2: OUT OF A METAPHORICAL CONTAINER

Sometimes the combination of *iz-* with a verb of motion creates verbs that are less directly related to physical movement. A case in point is *izbežat'* 'avoid' from *bežat'* 'run'. We analyze avoidance as metaphorical movement away from something<sup>23</sup> and therefore place *izbežat'* in subcategory 2, which contains verbs describing metaphorical motion.

## Subcategories 3: EMPTY A CONTAINER and 4: EMPTY A METAPHORICAL CONTAINER

The idea that *iz-* has a more abstract meaning than *vy-* receives further support from the fact that in our database *iz-* is not attested in subcategory 3, but occurs in the corresponding metaphorical subcategory 4. For instance, *izlit'* 'express', which is derived from *lit'* 'pour', is used in expressions like *izlit' svoju dušu* 'pour out one's soul' where one's concerns metaphorically speaking move out of one's soul.

## Subcategories 5: EXHAUSTIVE RESULT, 6: EXHAUST A SURFACE, 7: NEGATIVE EXHAUSTION

Subcategories 5-7 emphasize the exhaustiveness of an action. *Izučit'*, for instance, denotes the process of learning something completely, and is therefore placed in subcategory 5. *Izryt'* 'dig up all over', which describes an action whereby a surface gets completely covered with holes, is placed in subcategory 6. Another example involving a motion verb is *iznosit'* 'wear out' from the base verb *nosit'* 'carry', which is also used in the meaning 'wear'. Here, the addition of *iz-* implies that the action is carried out exhaustively until the

<sup>23</sup> JANDA & CLANCY (2002: 118).

garment in question is destroyed (worn out). Accordingly, we place *iznosit'* in subcategory 7.

Subcategories 9: MAKE OUT OF, 10: DECLINE/DEVIATE, 11: ACQUIRE

Of the remaining five subcategories, only three are attested in our database. In subcategory 9 we find *izgotovit'* 'produce', in subcategory 10 we have *izognut'* 'bend out, crook', while subcategory 11 is represented by verbs like *isprosit'* 'acquire through asking'. It is instructive to compare *izognut'* 'bend out, crook' with *vygnut'* 'curve, arch' discussed in the previous section. These verbs appear to have partially overlapping meanings, but *izognut'* 'bend out, crook' implies a higher degree of intensity. Furthermore, while *vygnut'* 'curve, arch' is limited to actions resulting in an arch-shaped posture (e.g. *vygnut' spinu* 'stretch out one's back'), *izognut'* 'bend out, crook' can be used for other shapes, such as that of the treble clef in music:

(10) *Vstrečalis' nam dačniki s sobakami – s irlandskimi setterami ili borzými, izognutyymi, kak skripičnyj ključ.* (KOVAL' 1972)

'We have met holiday visitors with dogs – Irish setters or borzois, **twisted** like a treble clef.'

The fact that the same radial structure can be used to analyze both *vy-* and *iz-* shows that these prefixes have very similar meanings. However, since *iz-* inhabits a subset of the subcategories attested for *vy-*, it is clear that *iz-* has a more restricted meaning than *vy-*. In section 6, we see that Radial Category Profiling facilitates a more accurate comparison of the two prefixes. However, first we need to consider the prefixes in natural perfectives. This is the topic of the following two sections.

#### 4. *Radial category and emptiness: vy- in natural perfectives*

In the preceding sections, we have seen that *vy-* and *iz-* clearly have semantic content in specialized perfectives, insofar as the addition of the prefix changes the meaning of the verb. If we add *vy-* to *bežat'* 'run', the result is the specialized perfective *vybežat'* 'run out', where the meaning difference between 'run' and 'run out' is due to the semantic impact of the prefix. If we create a specialized perfective by prefixing *iz-* to *bežat'* 'run', the prefix incurs an even more radical semantic shift, as *izbežat'* has the more abstract meaning 'avoid'. The question now arises as to what the meanings of *vy-* and *iz-* are in *natural* perfectives. Recall from section 1 that natural perfectives form aspectual pairs with base verbs, and that the members of a pair have identical meanings (except for the difference between perfective and imperfective aspect). Two different hypotheses about the meaning of prefixes in natural perfectives have been entertained in the literature. Since the addition of a prefix does not change the meaning of the verb, the traditional approach has been to assume that prefixes are semantically empty or purely aspectual in natural perfectives<sup>24</sup>. In other words, according to this view the prefixes are semantically bleached and function as pure aspectual markers in natural perfectives. We refer to this as the "Emptiness Hypothesis".

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<sup>24</sup> ŠAXMATOV (1952), AVILOVA (1959 & 1976), TIXONOV (1964 & 1998), FORSYTH (1970), VINOGRADOV (1972), ŠVEDOVA et al. (1980), ČERTKOVA (1996), ZALIZNJAK & ŠMELEV (2000), MIRONOVA (2004).

An alternative hypothesis is that prefixes have the same meaning in specialized and natural perfectives. However, in natural perfectives the semantic contribution of the prefix is rendered “invisible” because the relevant meaning is present in the verb stem as well. In other words, if the prefix contains a semantic component that is already part of the meaning of the stem, the addition of the prefix does not change the meaning of the verb, and the result is a natural perfective. Since this hypothesis involves semantic overlap between prefix and stem, we refer to it as the “Overlap Hypothesis”. The Overlap hypothesis has a long history in Slavic linguistics<sup>25</sup>, but conclusive answers about the relative merits of the Emptiness and Overlap Hypotheses have not been arrived at. As pointed out by Krongauz<sup>26</sup>, the issue has turned into a “chronic” problem in Slavic linguistics lacking a satisfactory solution.

We propose that radial categories can shed light on the problem. Let us assume according to the Overlap Hypothesis that a prefix has the same meaning(s) in natural and specialized perfectives. If this is true, and if the natural perfectives also have the same meaning as the base verbs, we expect the base verbs for natural perfectives to mirror the meanings in the prefix’s radial category. In other words, for natural perfectives, we expect base verbs that align with the subcategories such as OUT OF A CONTAINER, EMPTY A CONTAINER, etc. These overlapping meanings camouflage the semantic contribution of the prefix, rendering it “invisible”. Thus the prediction from the Overlap Hypothesis is that natural perfectives with *vy-* and *iz-* will be restricted to the radial categories for these prefixes established in sections 2 and 3. If, on the other hand, we assume the Emptiness Hypothesis, we do not expect natural perfectives with *vy-* and *iz-* to be restricted to the radial categories in sections 2 and 3. Since according to this hypothesis the prefixes are semantically empty aspectual markers, they should be compatible with base verbs with any semantic properties. No matter what the meaning of a verb is, the prefix will not change it, since according to the Emptiness Hypothesis the prefix is void of semantic content in natural perfectives.

In order to test the Emptiness and Overlap Hypotheses we provide a classification of the 103 natural perfectives prefixed in *vy-* in our database. (We turn to natural perfectives with *iz-* in the following section.) Figure 4 summarizes the situation and facilitates comparison of specialized and natural perfective *vy-*verbs. Solid lines represent subcategories attested for both types of perfectives, while dashed lines are used for subcategories where only specialized perfectives occur. As shown in the figure, natural perfectives in *vy-* are found in a subset of the subcategories where *vy-* occurs in specialized perfectives. Table 3 lists all the verbs under scrutiny. Notice, however, that each verb occupies only two columns in Table 3. This is because we are dealing with natural perfectives where the prefixed perfective verb and the corresponding simplex imperfective verb have the same meaning. It is therefore not necessary to list the imperfective base verbs in Table 3.

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<sup>25</sup> VEY (1952), VAN SCHOONEVELD (1958), ISAČENKO (1960), TIMBERLAKE (2004: 410-11). See also an overview in NÜBLER (1990).

<sup>26</sup> KRONGAUZ (1998: 82).

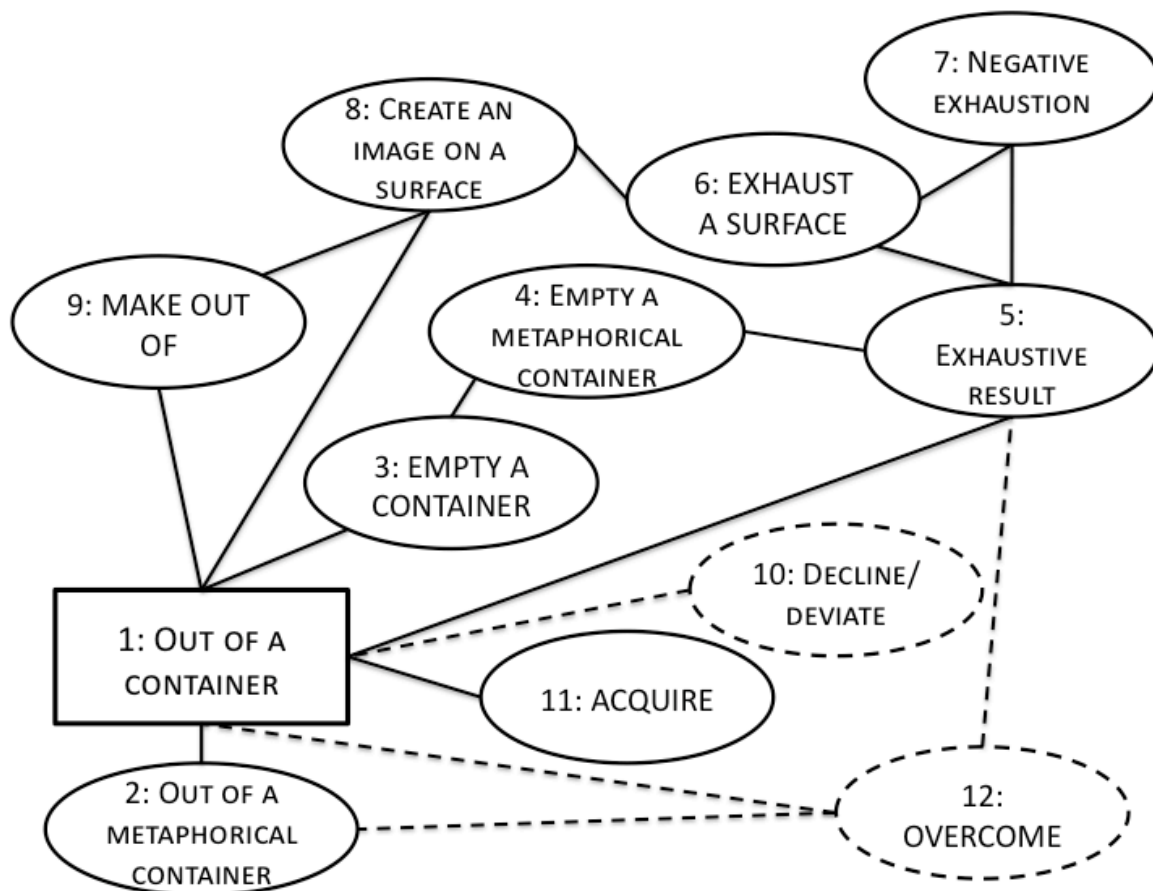


Figure 4: Radial Category Network for Natural Perfectives in *vy-*

**Subcategory 1: OUT OF A CONTAINER**

<i>vygnat'</i>	'drive out'	<i>vyrulit'</i>	'drive out'
<i>vykorčevat'</i>	'root out'	<i>vyskresti</i>	'scrape out, remove'
<i>vykristalizovat'sja</i>	'crystallize'	<i>vytaraščit'(sja)</i>	'open one's eyes wide'
<i>vylinjat'</i>	'shed hair'	<i>vytaščit'</i>	'drag out'
<i>vyluščit'</i>	'chuck out'	<i>vyterebit'</i>	'pull the roots of a plant out'
<i>vypalit'</i>	'shoot, fire at'	<i>vytošnit'</i>	'throw up'
<i>vypolot'</i>	'pull weeds'	<i>vytravit'</i>	'exterminate'
<i>vypotrošit'</i>	'disembowel'	<i>vyturit'</i>	'push out'
<i>vypučit'(sja)</i>	'goggle (eyes)'	<i>vytjanut'(sja)</i>	'stretch out'
<i>vypjalit'sja</i>	'goggle (eyes)'	<i>vyudit'</i>	'catch a fish'
<i>vyrvat'</i>	'pull out, tear out'	<i>vyčesat'</i>	'comb out'

**Subcategory 2: OUT OF A METAPHORICAL CONTAINER**

<i>vybrodit'</i>	'ferment'	<i>vypravit'</i>	'correct'
<i>vylečit'(sja)</i>	'cure'	<i>vyrasti</i>	'grow up'
<i>vypestovat'</i>	'cherish, nurse up a child'	<i>vyrastit'</i>	'cultivate'
<i>vypoit'</i>	'bring up an animal'		



**Subcategory 3: EMPTY A CONTAINER**

<i>vydolbit'</i>	'hollow out, gouge out'	<i>vyryt'</i>	'dig up, dig out'
<i>vyžat'</i>	'press out, squeeze out'	<i>vysmorkat'(sja)</i>	'blow one's nose'
<i>vykopat'</i>	'dig up, out'	<i>vysosat'</i>	'suck out, up'
<i>vylakat'</i>	'lap, drink all up'	<i>vytrjasti</i>	'shake out'
<i>vypit'</i>	'drink up'	<i>vycedit'</i>	'strain, filter all the liquid'

**Subcategory 4: EMPTY A METAPHORICAL CONTAINER**

<i>vybranit'sja</i>	'curse'	<i>vyrugat'sja</i>	'swear'
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**Subcategory 5: EXHAUSTIVE RESULT**

<i>vydrat'</i>	'beat up'	<i>vyslušat'</i>	'listen to all the speech'
<i>vydressirovat'</i>	'train (animals)'	<i>vysoxnut'</i>	'dry up'
<i>vyzubrit'</i>	'learn by heart'	<i>vystirat'</i>	'wash up'
<i>vykosit'sja</i>	'form ears (of grain)'	<i>vystroit'(sja)</i>	'build up; form up a row'
<i>vykupat'(sja)</i>	'bathe'	<i>vysušit'(sja)</i>	'dry out'
<i>vymoknut'</i>	'become soaking wet'	<i>vytverdit'</i>	'learn by heart'
<i>vymočit'</i>	'soak, drench'	<i>vytopit'</i>	'heat a room'
<i>vymuštrovat'</i>	'train'	<i>vyučit'(sja)</i>	'learn'
<i>vyparit'(sja)</i>	'affect with steam'	<i>vyčistit'(sja)</i>	'clean up'
<i>vypoloskat'</i>	'rinse up'	<i>vyškolit'</i>	'train, discipline'

**Subcategory 6: EXHAUST A SURFACE**

<i>vybelit'</i>	'bleach'	<i>vymostit'</i>	'pave'
<i>vygladit'</i>	'iron'	<i>vymyt'(sja)</i>	'wash out'
<i>vydrait'</i>	'polish'	<i>vypačkat'(sja)</i>	'soil, stain all over'
<i>vydubit'</i>	'tan a skin'	<i>vyrovnjat'</i>	'smooth out, level'
<i>vyzolitit'</i>	'gild, cover with gold'	<i>vyskoblit'</i>	'scrape out, remove'
<i>vykakat'</i>	'make smooth'	<i>vysmolit'</i>	'tar up, cover with tar'
<i>vykrasit'(sja)</i>	'paint'	<i>vyuťjužit'</i>	'iron'
<i>vymazat'(sja)</i>	'smear up all over'	<i>vyčernit'</i>	'dye black'
<i>vymarat'</i>	'make dirty (hands in ink)'	<i>vyšlifovat'</i>	'polish'

**Subcategory 7: NEGATIVE EXHAUSTION**

<i>vybranit'</i>	'scold'	<i>vyrugat'</i>	'scold'
<i>vymorit'</i>	'exterminate'	<i>vyseč'</i>	'beat up'
<i>vyporot'</i>	'whip'	<i>vystegat'</i>	'whip'

**Subcategory 8: CREATE AN IMAGE ON A SURFACE**

<i>vygravirovat'</i>	'engrave'	<i>vyčekanit'</i>	'mint, make image on metal'
<i>vytatuirovat'</i>	'tattoo'	<i>vyštampovat'</i>	'print a design pressing with a tool'
<i>vytkat'</i>	'weave'		

**Subcategory 9: MAKE OUT OF**

<i>vydut'</i>	'produce by strong stream of air'	<i>vyplavit'</i>	'smelt'
<i>vykovat'</i>	'forge'	<i>vyprjast'</i>	'spin, make thread out of'
<i>vykrojit'</i>	'cut out'	<i>vystrogat'</i>	'plane, make wood smoother'
<i>vylepit'</i>	'mould'	<i>vystročit'</i>	'sew on sewing-machine'

<i>vylit'</i>	'cast, shape hot liquid metal'	<i>vytačat'</i>	'stitch'
<i>vymetat'</i>	'make buttonholes'	<i>vytočit'</i>	'turn (tech.)'

**Subcategory 10: DECLINE/DEVIATE: Not attested**

**Subcategory 11: ACQUIRE**

<i>vykljančit'</i>	'get by begging'	<i>vycyganit'</i>	'get by begging'
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**Subcategory 12: OVERCOME: Not attested**

**Table 3: Natural perfectives in *vy-***

Natural perfective *vy-*verbs are attested in ten out of twelve subcategories; the only subcategories where natural perfectives in *vy-* do not occur are 10 and 12. Furthermore, the base verbs have meanings that are compatible with the meanings of the subcategories. Examples of the prototypical subcategory 1: OUT OF A CONTAINER include *vypolot'* 'pull out (weeds)', where the weeds move out of their original location in, say, a flowerbed. An example of subcategory 2: OUT OF A METAPHORICAL CONTAINER is *vylečit'* 'cure', where the change of state from sick to healthy can be conceptualized as metaphorical motion. Subcategory 3: EMPTY A CONTAINER contains verbs like *vyžat'* 'squeeze out', where the movement leaves the landmark empty. The corresponding metaphorical subcategory 4 counts examples like *vyrugat'sja* 'swear', where the subject empties his/her mind of frustrations by swearing.

The exhaustiveness subcategories 5-7 are represented by verbs such as *vyzubrit'* 'learn (completely) by heart' (subcategory 5: EXHAUSTIVE RESULT), *vygladit'* 'iron', which applies to a surface (subcategory 6: EXHAUST A SURFACE), and the clearly negative *vymorit'* 'exterminate' (subcategory 7: NEGATIVE EXHAUSTION). Subcategory 8: CREATE AN IMAGE ON A SURFACE features verbs such as *vygravirovat'* 'engrave' and *vytatuirovat'* 'tattoo', which involve images emerging on a surface. Closely related is *vykovat'* 'forge' (subcategory 9: MAKE OUT OF), which involves the creation of something, but where the action does not apply to a surface; subcategory 9 contains verbal bases involved in manufacture. In subcategory 11: ACQUIRE, we find the two verbs *vykljančit'* and *vycyganit'*, which both mean 'acquire by begging'.

Two conclusions can be drawn. First, natural perfectives are found in a subset of the subcategories attested for specialized perfectives. Second, there are no natural perfective *vy-*verbs outside the radial category established for *vy-* in specialized perfectives in section 3. These results favor the Overlap Hypothesis over the Emptiness Hypothesis. Recall that the Overlap Hypothesis predicts that natural perfective *vy-*verbs are limited to the radial category of *vy-* in specialized perfectives. This is exactly the distribution we observe in Table 3 and Figure 4. On the basis of the Emptiness Hypothesis, on the other hand, we would not expect natural perfectives in *vy-* to be limited to the radial category of *vy-* in specialized perfectives, since a semantically empty prefix would be able to form aspectual pairs with base verbs regardless of their semantics. In the next section, we shall see that comparison of the radial categories of *iz-*verbs provides further evidence for the Overlap Hypothesis.

## 5. Radial category and emptiness: *iz-* in natural perfectives

Our database contains thirty-nine natural perfectives in *iz-*. Figure 5 provides a radial category network for natural perfectives in *iz-*. Solid lines represent subcategories where both natural and specialized perfectives occur, while dashed lines stand for subcategories where only specialized perfectives are attested. The situation parallels the situation for *vy-* described in the previous section; natural perfectives in *iz-* are attested in a subset of the meanings of *iz-* in specialized perfectives. The verbs are classified in Table 4.

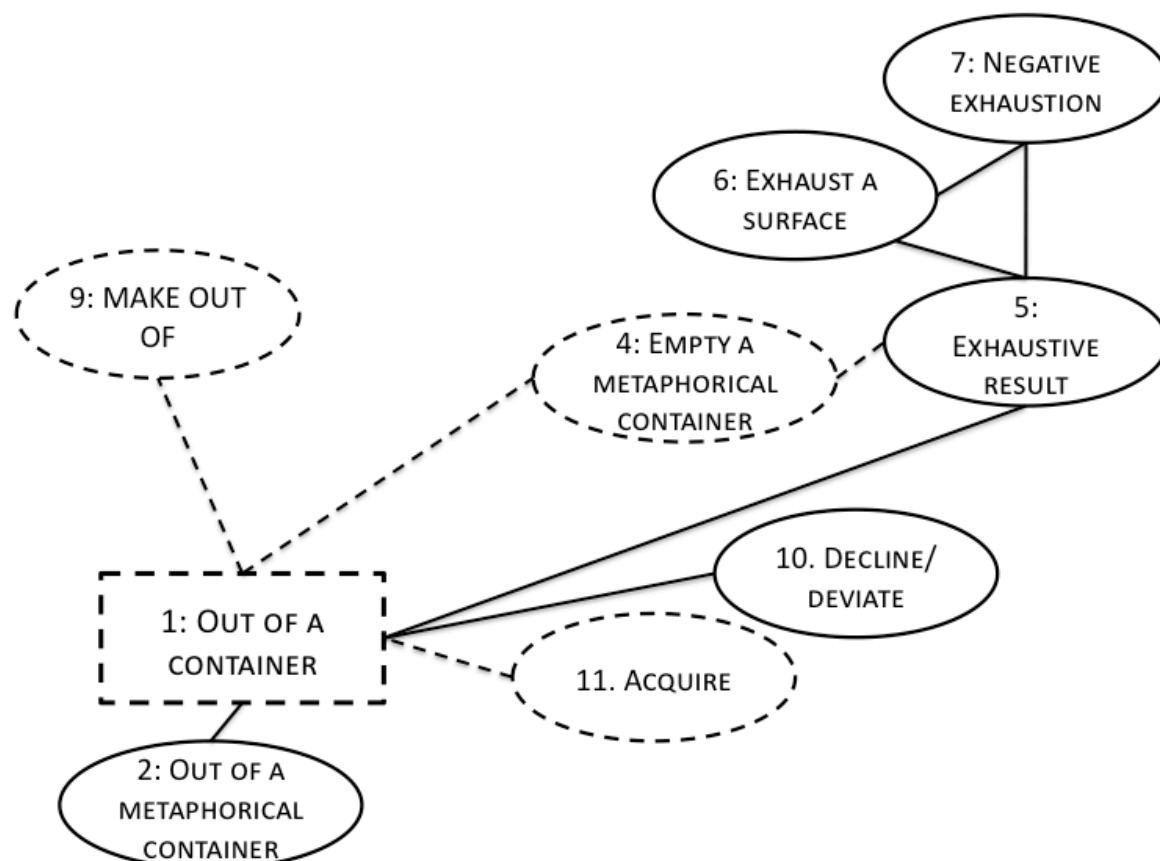


Figure 5: Radial category for Natural Perfectives in *iz-*

**Subcategory 1: OUT OF A CONTAINER: Not attested**

**Subcategory 2: OUT OF A METAPHORICAL CONTAINER**

*izlečit'*(*sja*) 'cure' *izmenit'*(*sja*) 'change'

**Subcategory 3: EMPTY A CONTAINER: Not attested**

**Subcategory 4: EMPTY A METAPHORICAL CONTAINER: Not attested**

**Subcategory 5: EXHAUSTIVE RESULT**

<i>izbalovat'</i>	'spoil a child'	<i>istratit'</i> ( <i>sja</i> )	'spend, waste'
<i>izžarit'</i> ( <i>ся</i> )	'roast, fry'	<i>istupit'</i> ( <i>sja</i> )	'blunt'
<i>iskupat'</i>	'bathe'	<i>iskromsat'</i>	'cut to pieces'
<i>izmerit'</i>	'measure'	<i>iskrošit'</i> ( <i>sja</i> )	'crumble up'
<i>ispeč'</i> ( <i>sja</i> )	'bake'	<i>izmel'čat'</i>	'become smaller'
<i>isprobovat'</i>	'try'	<i>izmel'čit'</i>	'chop'
<i>izrasxodovat'</i> ( <i>sja</i> )	'spend all of'	<i>istoloč'</i>	'pound to powder'

*istopit'* 'heat, stoke'

**Subcategory 6: EXHAUST A SURFACE**

*izmazat'(sja)* 'smear all over'

*ispačkat'(sja)* 'soil, stain'

*ispolosovat'* 'cover with welts'

*izrešetit'* 'cover with holes'

**Subcategory 7: NEGATIVE EXHAUSTION**

*izdoxnut'* 'die (of animals)'

*iskalečit'(sja)* 'cripple, maim, break'

*izmučat'(sja)* 'torment'

*izmučit'(sja)* 'torment'

*izmytarit'(sja)* 'torment, harass'

*izmjat'(sja)* 'crumple all over'

*iznasilovat'* 'rape'

*ispepelit'* 'incinerate'

*isportit'(sja)* 'spoil'

*ispugat'(sja)* 'scare'

*istomit'(sja)* 'tire, torment'

*istočit'* 'sharpen; eat away'

*istrepat'(sja)* 'fray, tear'

*istruxljavet'* 'moulder'

*izuvečit'(sja)* 'maim, mutilate'

**Subcategory 8: CREATE AN IMAGE ON A SURFACE: Not attested**

**Subcategory 9: MAKE OUT OF: Not attested**

**Subcategory 10: DECLINE/DEVIATE**

*iskoverkat'* 'distort, mangle'

*iskorežit'(sja)* 'bend, warp'

*iskrivit'(sja)* 'bend, distort'

**Subcategory 11: ACQUIRE: Not attested**

**Subcategory 12: OVERCOME: Not attested**

**Table 4: Natural Perfectives in *iz-***

Figure 5 and Table 4 show that natural perfectives in *iz-* have a more restricted distribution than the categories explored in the previous sections; natural perfectives in *iz-* are attested in only five out of twelve subcategories. Verbs like *izlečit'sja* 'cure, take out of illness' exemplify metaphorical motion out of a container (subcategory 2). In subcategories 5 through 7, which focus on exhaustiveness, we find verbs such as *israsxodovat'* 'spend all of', *izmazat'* 'smear all over' and *isportit'* 'spoil'. In subcategory 10: DECLINE, DEVIATE we find verbs like *iskrivit'* 'bend, distort'. The fact that all natural perfectives in *iz-* are accommodated in the radial category in Figure 5 lends further support to the Overlap Hypothesis.

## 6. Radial Category Profiling

Now that we have explored radial categories for the four classes of verbs under scrutiny in the present study, we are in a position to undertake comparisons via a new methodology that we propose here called Radial Category Profiling. Radial Category Profiling sharpens our understanding of the Overlap Hypothesis, and furthermore sheds light on a long-standing issue in Russian linguistics, namely the relationship between Church Slavic and East Slavic elements in Contemporary Standard Russian.

With the advent of large electronic corpora, the development of quantitative methods has become a major concern in cognitive linguistics, and Radial Category Profiling contributes to this tradition. Pioneers are Stefanowitsch & Gries<sup>27</sup> who developed

<sup>27</sup> STEFANOWITSCH & GRIES (2003).

*collostructional analysis*, a cluster of methods investigating a word's degree of attraction or repulsion to a construction. A related approach addressing near-synonymy is *behavioral profiles* developed by Divjak & Gries<sup>28</sup>, who studied nine verbs of meaning 'try' in Russian. Divjak & Gries tagged 1585 sentences for eighty-seven variables involving a number of properties of the verbs themselves and the constructions they appear in. Each verb received a "behavioral profile" defined by its scores for the variables. The profiles were subjected to statistical analysis, which measured the semantic distances between the nine near-synonymous verbs meaning 'try'. Another variant of linguistic profiling is Janda & Solovyev's *constructional profiles*<sup>29</sup>. Janda & Solovyev studied the distribution of Russian words for 'sadness' and 'happiness' across seventy constructions, and established constructional profiles reflecting the distribution of relative frequencies of constructions associated with each word. Statistical analysis facilitates a measure of the subtle similarities and differences of the words under scrutiny. Janda & Lyashevskaya<sup>30</sup> have coined the term *grammatical profile*, the relative frequency distribution of the inflected forms of a word in a corpus. In their study of Russian verbs, Janda & Lyashevskaya argue that grammatical profiles shed light on the nature of aspectual pairs in Russian.

The various kinds of linguistic profiling described above have proved successful in teasing apart subtle differences between linguistic elements based on their behavior in corpora. In this study we propose Radial Category Profiling, which we define as follows:

(11) A Radial Category Profile is the relative frequency distribution of the subcategories of a radial category.

We compare the radial category profiles of the four types of perfective verbs examined in this study: specialized perfectives formed with *vy-* and *iz-*, and natural perfectives formed with *vy-* and *iz-*. The type frequencies (raw numbers and percentages) for the four types of verbs under analysis are summarized in Table 5 and visualized in Figure 6. In principle, it would be possible to compare all twelve subcategories. However, in order to facilitate meaningful statistical analysis, it was necessary to conflate subcategories. We organized the subcategories into three semantically related groups. The first group consists of subcategories 1 through 4 (OUT OF A [METAPHORICAL] CONTAINER, EMPTY A [METAPHORICAL] CONTAINER), which all emphasize movement out of the landmark. The second group comprises subcategories 5 through 7 (EXHAUSTIVE RESULT, EXHAUST A SURFACE, NEGATIVE EXHAUSTION), which involve the exhaustiveness of the action. Recall from section 2 that the difference between the OUT OF and EXHAUST groups corresponds to a difference between two syntactic constructions, insofar as the former, but not the latter typically combine with the preposition *iz* followed by a noun phrase in the genitive representing the landmark. The third and last group includes the remaining subcategories, i.e. the subcategories that belong neither to the OUT OF, nor to the EXHAUST group.

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<sup>28</sup> DIVJAK & GRIES (2006).

<sup>29</sup> JANDA & SOLOVYEV (2009).

<sup>30</sup> JANDA & LYASHEVSKAYA ([forthcoming](#)).

	Subcategories 1-4: OUT OF	Subcategories 5-7: EXHAUST	Other	Total
<i>vy</i> - specialized perfectives	61 (64.2%)	14 (14.7%)	20 (21.1%)	95 (100%)
<i>iz</i> - specialized perfectives	15 (39.5%)	17 (44.7%)	6 (15.8%)	38 (100%)
<i>vy</i> - natural perfectives	40 (38.8%)	44 (42.7%)	19 (18.4%)	103 (100%)
<i>iz</i> - natural perfectives	2 (5.1%)	34 (87.2%)	3 (7.7%)	39 (100%)

Table 5: Radial Category Profiles: raw numbers (percentages in parentheses)

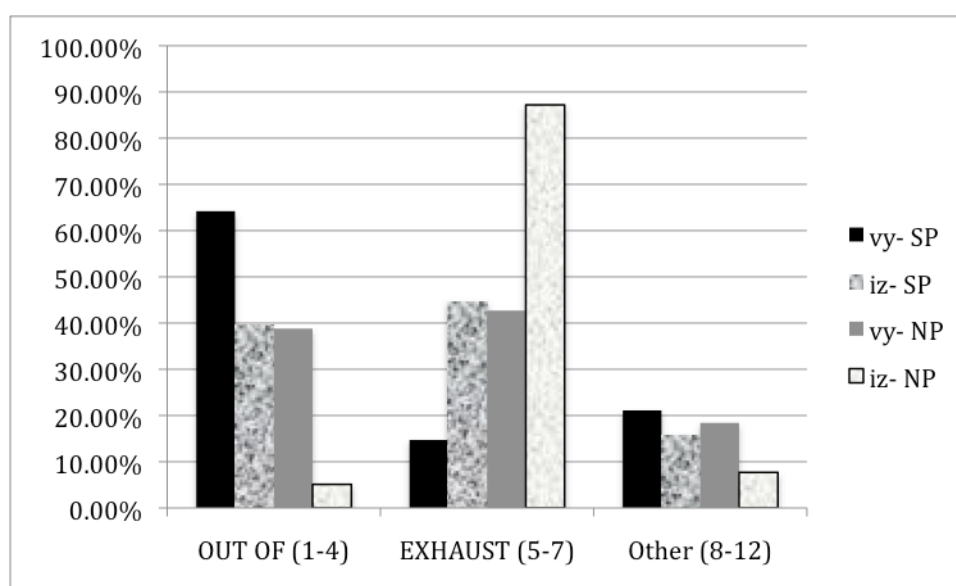


Figure 6: Radial Category Profiles (percentages)

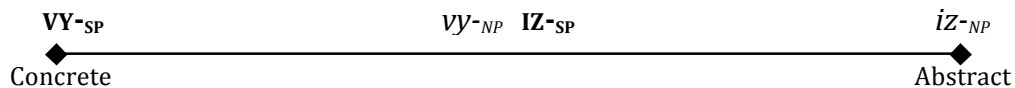
Table 5 and Figure 6 suggest that the four verb types under scrutiny have different Radial Category Profiles. A Pearson's Chi-squared test confirms that the differences we see are significant: chi-squared= 64, degrees of freedom = 6, and the p-value (the probability that this distribution is attributable to chance) = 6.674e-12 (i.e. 0.00... 6674 with eleven zeros before 6674, a very small number). The omega value for the effect size is 0.483, which is a fairly large effect size, showing that the results are both significant and robust.<sup>31</sup>

Subcategories 1-7 dominate the radial category profiles of all four types of verbs, with the other subcategories (8-12) accounting for a residue of about 20% or less. The *vy*-specialized perfectives are primarily characterized by OUT OF meanings, which constitute 64.2% of their profile. At the other extreme are the *iz*- natural perfectives where the center

<sup>31</sup> All calculations were carried out using the R statistical software package. The effect size, omega, is calculated by taking the square root of the chi-squared value (64) divided by the total sample size (275) multiplied by the smallest degrees of freedom in the matrix (2). This yields Cramer's Phi, which can be converted to omega by multiplying it by the square root of the smallest degrees of freedom in the matrix (2). See KING & MINIUM (2008: 329) for details. According to COHEN (1988), 0.1 = small effect, 0.3 = medium effect, and 0.5 = large effect.

of gravity is with the EXHAUST meanings that pertain to 87.2% of the verbs. This difference in balance is so strong that one might suggest that the prototype for *iz-* has actually shifted. Whereas historically *iz-* was earlier centered around OUT OF A CONTAINER<sup>32</sup>, today it appears to be shared between subcategories 5: EXHAUSTIVE RESULT and 7: NEGATIVE EXHAUSTION. The *iz-* specialized perfectives and the *vy-* natural perfectives are virtually identical in their radial category profiles, with balanced representation of OUT OF and EXHAUST.

The meanings of the OUT OF vs. EXHAUST subcategories differ with regard to concreteness/abstractness, insofar as spatial motion is more concrete than the less tangible notion of exhaustiveness. In Figure 7, we have ordered the four verb types on a scale of concreteness/abstractness. We represent specialized and natural perfectives by means of the indices SP and NP, respectively. For the convenience of the reader, we also give specialized perfectives in boldfaced capitals, while natural perfectives are italicized. Specialized perfectives in *vy-* are placed at the concrete end of the scale, since these verbs display the highest percent score for the OUT OF meanings. Natural perfectives in *iz-* are placed at the abstract end of the scale, since their Radial Category Profile has the highest percent score for EXHAUST. Natural perfectives in *vy-* and specialized perfectives in *iz-* occupy intermediate positions.



**Figure 7: The abstractness scale (SP = specialized perfective, NP = natural perfective)**

Four generalizations can be made. First, the Radial Category Profiles as represented in the abstractness scale show that *iz-* has a more abstract meaning than *vy-*. Second, for a given prefix, natural perfectives have a more abstract meaning than specialized perfectives. Third, the choice of prefix and the choice of type of perfective have essentially the same semantic effect, insofar as both factors affect concreteness/abstractness. While *iz-* and natural perfectives yield abstract meanings, *vy-* and specialized perfectives pull in the opposite direction. Fourth, we cannot decide whether the prefix exerts a stronger force than the type of perfective or vice versa. This can be seen from the fact that specialized perfectives in *iz-* and natural perfectives in *vy-* have very similar Radial Category Profiles. These four generalizations demonstrate that Radial Category Profiling provides a powerful tool for the comparison of closely related categories. With this in mind, we are in a position to address the two issues mentioned in the beginning of this section, namely the Overlap Hypothesis and the relationship between Church Slavic and East Slavic elements in Contemporary Standard Russian. In sections 4 and 5, we adduced evidence in favor of the Overlap Hypothesis; natural perfectives occur in a subset of the same subcategories attested for the *vy-* and *iz-* in specialized perfectives. Radial Category Profiling facilitates a more fine-grained analysis, since the type frequency of a subcategory can be taken into account. While we have seen that the meaning of *vy-* and *iz-* overlap with the meaning of the verbal stem in natural perfectives, Radial Category Profiling indicates that the meaning of a prefix has different centers of gravity in natural and specialized perfectives.

<sup>32</sup> DADAVAEVA (1978).

Moreover, our analysis suggests that the difference is not random; we have seen that natural perfectives involve a higher degree of abstractness than specialized perfectives. As for the relationship between Church Slavic and East Slavic elements in Contemporary Standard Russian, the traditional wisdom is that Church Slavonicisms tend to have more abstract meanings than East Slavic elements (see section 1 above). However, typically this hypothesis concerning abstractness has pertained largely to word pairs such as East Slavic *golova* ‘head (body part)’ and Church Slavic *glava* ‘head (leader); chapter (of a book)’. Radial Category Profiling provides a means to test the abstractness hypothesis in a more scientific way, and also demonstrates that this hypothesis is valid beyond the realm of lexical Church Slavonicisms. Recall from section 1 that *iz-* is regarded as the Church Slavic prefix corresponding to East Slavic *vy-*. Given this, the abstractness hypothesis predicts that *iz-* displays a more abstract meaning than *vy-*. This is exactly what Radial Category Profiles in Table 5 and Figure 6 indicate. In other words, we can conclude that Radial Category Profiling provides substantial evidence in favor of the abstractness hypothesis, suggesting that this hypothesis is valid not only for lexical Church Slavonicisms, but also yields correct implications for grammatical elements such as aspectual prefixes.

## 7. Conclusion

In this article we have proposed an extension of the theory of radial categories, which we refer to as “Radial Category Profiling”. This method facilitates detailed and insightful comparisons of closely related linguistic categories. In this way, Radial Category Profiling provides a valuable addition to the family of methods called “linguistic profiling”, and to quantitative approaches in cognitive linguistics in general.

We have provided detailed accounts of the Radial Category profiles of the Russian aspectual prefixes *vy-* and *iz-* in specialized and natural perfectives. Our analysis has shown that (i) *iz-* has a more abstract meaning than *vy-*, (ii) natural perfectives have a more abstract meaning than specialized perfectives, and (iii) the choice of prefix and the type of perfective have similar semantic effects, since both factors pertain to concreteness/abstractness.

Radial Category Profiling contributes to two long-standing issues in Russian linguistics. First of all, our analysis lends support to the Overlap Hypothesis, thus suggesting that Russian aspectual prefixes are never semantically empty or purely aspectual. We have shown that while the meanings of prefixes in specialized and natural perfectives are coextensive, the distributions across these meanings are not identical. Furthermore, the semantic difference between the two types of perfectives is not random; our analysis suggests that prefixes have more abstract meanings in natural than in specialized perfectives.

The second issue Radial Category Profiling sheds light on is the interplay of East Slavic and Church Slavic elements in Contemporary Standard Russian. Our analysis sharpens the traditional insight that Church Slavonicisms are more abstract than elements of East Slavic origin, and furthermore indicates that this pertains not only to lexical elements, but also to *grammatical* Church Slavonicisms such as the *iz-* prefix.

In order to reveal the full potential of Radial Category Profiling, further research is required. In particular, it is necessary to investigate how similar two categories must be in



order for a comparison of Radial Category Profiles to be meaningful. A further line of future research would aim at developing more sophisticated models for statistical analysis than what has been applied in the present study. However, while no single study of this scope could fully demonstrate the potential of Radial Category Profiling, the new methodology we propose opens up alleys of fruitful research for the future.

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