

1 **Med Slavic Aspectual Prefixes and Numeral Classifiers: Two Kinds of Lexico-**  
2 **Grammatical Unitizers**, by Stephen M. Dickey and Laura A. Janda

3  
4 **Abstract**

5  
6 What do Slavic aspectual prefixes have in common with numeral classifiers? Our  
7 answer is that the parallels are compelling, both in terms of breadth and depth. The  
8 grammatical function of numeral classifiers is to form and classify units for the  
9 referents of nouns, and we argue that Slavic aspectual prefixes have the function of  
10 forming and classifying units for the referents of verbs. Numeral classifiers contribute  
11 a meaning of discreteness to objects, whereas Slavic aspectual prefixes do the same  
12 for events. Just as there are various types of numeral classifiers, there are also various  
13 types of Slavic aspectual prefixes. We find that the patterns identified for numeral  
14 classifiers are consistently matched by the grammatical behavior of the various types  
15 of aspectual prefixes throughout the Slavic linguistic territory. We furthermore anchor  
16 this comparison in a variety of ways, taking into account distributional and semantic  
17 evidence, and the effects of construal, foregrounding, definiteness, and  
18 transnumerality. In the places where this comparison breaks down, the causes are  
19 inherent differences between the domain of nouns and the domain of verbs. We  
20 suggest that Slavic aspectual prefixes and numeral classifiers should be considered to  
21 be verbal and nominal instantiations of a general category of lexico-grammatical  
22 unitizers.

23  
24 Keywords: aspect; numeral classifier; verb classifier; Slavic; prefixes

25  
26 **1. Introduction**

27 Our basic claim is that numeral classifiers and verb classifiers perform similar  
28 functions as lexico-grammatical unitizers for the respective word classes of nouns and  
29 verbs and that this analogy is particularly apt for an analysis of verbal prefixes in the  
30 Slavic languages. The shared function of specifying default, common or ad hoc units  
31 of individualization is the basis for the term **unitizer**, which has been applied to  
32 numeral classifiers (cf. Broschart 2000: 260 and Lucy 2000: 334; the latter in fact  
33 proposes calling numeral classifiers “numeral unitizers” to more properly capture  
34 their grammatical nature). Slavic aspectual prefixes behave like numeral classifiers in  
35 that they identify and classify units of verbal activity: events. We make an innovative  
36 argument for typological correspondence that can contribute to a better understanding  
37 of both noun and verb classifiers. Our claim brings with it a wide-ranging series of  
38 effects and implications that we explore in this article.

39 We begin in section 2 by reviewing some analogies between nouns and verbs,  
40 focusing on specific areas of convergence and divergence that are relevant to our  
41 argument. Section 3 presents previous work on Russian “purely perfectivizing”  
42 prefixes as the verbal analogues of sortal numeral classifiers and extends this analysis  
43 to all telic perfectives in all Slavic languages. The remaining perfectives, namely  
44 atelic perfectives found mostly in the eastern parts of the Slavic territory, are  
45 compared with mensural numeral classifiers in section 4. The arguments in sections 3  
46 and 4 are buttressed by further parallels between Slavic perfectivizing prefixes and  
47 numeral classifiers in section 5, among them the structure of the meanings of  
48 classifiers and how they can affect the construal of both objects and events, as well as  
49 the phenomenon of general classifiers, and effects of foregrounding, definiteness, and  
50 transnumerality. We sum up our findings in section 6.

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2 **2. Analogies Between Nouns and Verbs**

3 Our argument rests on a comparison between nouns and verbs. While analogies  
 4 between these two word classes have often been made by linguists (see Janda, 2004  
 5 for numerous references and discussion), we will make use of some details that are  
 6 perhaps less obvious in this connection, but particularly relevant to the behavior of  
 7 Slavic perfectivizing prefixes. Nouns prototypically refer to objects and substances  
 8 whereas verbs refer to situations.<sup>1</sup> More specifically, achievements and  
 9 accomplishments are crisply delimited events analogous to discrete solid objects,  
 10 whereas states and activities are analogous to substances.<sup>2</sup> In Slavic languages, base  
 11 verbs are typically imperfectives and refer to states and activities that can be reified  
 12 into events by means of perfectivizing prefixes. Physical motion events that unfold in  
 13 both space and time, which we take to be prototypical, have trajectories that parallel  
 14 the shapes of discrete objects.

15 However, there are some important differences due to the facts that a) objects  
 16 are stable in time, whereas events are not, and b) time is inherently directional with  
 17 only one dimension, whereas space is not directional and has three dimensions.  
 18 Objects can often be viewed in their entirety, but this is less true of events because  
 19 they unfold over time. As a result, we speak of beginnings and endings with respect to  
 20 events, but of edges with respect to objects. Temporal stability makes it easy for  
 21 numerous objects to be perceived simultaneously, but this is less possible for events.<sup>3</sup>  
 22 Objects can be foregrounded, often with substances as background, like shells on the  
 23 sand of a beach. Nouns that are highly salient are those that are central to a narrative  
 24 and therefore emphasized or repeated. Foregrounding in the verbal domain is  
 25 manifested as the sequence of causal plotline events along the single dimension of  
 26 time, against the background of states and activities that form the setting. Definite  
 27 reference is more pronounced in the nominal domain; while it is possible for speakers  
 28 and hearers to refer to events as part of shared knowledge, this is less common.

29 An important conceptual parallel between verbal roots on the one hand and  
 30 bare nouns in numeral classifier languages on the other is **transnumerality**. Numeral  
 31 classifier languages tend to lack obligatory plural inflection, and this fact has been  
 32 explained broadly in terms of the **transnumerality** of nouns in numeral-classifier  
 33 languages (cf. Bisang 1999: 114, citing Greenberg, 1972). Similarly, Zhang (2013)  
 34 considers all nouns in Mandarin Chinese to be non-count nouns. For example, in the  
 35 following Mandarin example (taken from Rullmann and You, 2006) the noun *shu*  
 36 ‘book’ can only be translated as ‘one or more books’.

37

- 38 (1) *Zuotian wo mai le shu.*  
 39 Yesterday I buy PF book  
 40 ‘Yesterday, I bought one or more books.’

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<sup>1</sup> For the sake of readability we use the terms “noun” and “verb” in this article to indicate both nouns and verbs and the objects and situations to which they refer.

<sup>2</sup> On these parallels cf. also Mehlig (1994) and Langacker’s (1987a) descriptions of the profiles of count and mass nouns.

<sup>3</sup> Langacker’s (2008: 109-112) notion of scanning is relevant here: events designated by verbs are usually scanned sequentially, whereas objects are usually scanned in a summary fashion, i.e., all at once. But note that objects can be scanned sequentially in fictive motion, in which case we can talk about their “beginnings” and “ends” (for example, of a road) as well.

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2 The basic transnumerality of bare nouns in numeral classifier languages can be seen  
3 as a feature common to Slavic verbal roots, inasmuch as verbs themselves do not  
4 inflect for the number of events, for the reasons given above: events tend not to  
5 coexist in large numbers due to their temporal instability. Thus, we suggest that it is  
6 the default transnumerality both of nouns in numeral-classifier languages and of  
7 verbal roots in Slavic that motivates the category of lexico-grammatical unitizers in  
8 each type of language.<sup>4</sup>

9 All of these parallels, both those that show convergence of nouns and verbs  
10 and those that show divergence, are relevant to our description of Slavic  
11 perfectivizing prefixes as the verbal analogues of numeral classifiers.  
12

### 13 **2.1 Numeral Classifiers and Verb Classifiers as Lexico-Grammatical Unitizers**

14 There is considerable controversy over the nature of systems of noun classification,  
15 including numeral classifiers.<sup>5</sup> Even a brief review of the issues lies beyond the scope  
16 of this article (the interested reader is referred to Bisang, 1999; Aikhenvald, 2000;  
17 Kilarski, 2013; and the articles in Senft, 2000 and Zhang, 2013). Numeral classifier  
18 systems are a means of marking noun class that are common in the languages of East  
19 and Southeast Asia, but also found in other languages of the world (other means are  
20 gender systems, noun classifiers, possessive classifiers and verbal classifiers, cf.  
21 Grinevald, 2004). Numeral classifiers are lexical items of a closed class that typically  
22 occur in constructions with nouns after numerals, i.e., NUM + CL + N, and classify a  
23 head noun as belonging to various semantic categories (e.g., reflecting shape or  
24 animacy; again, for an overview see Aikhenvald, 2000). According to Bisang (1999:  
25 116), numeral classifiers can have four basic functions: (1) individuation of counting  
26 units of nouns, (2) classifying nouns into types according to the counting unit, (3)  
27 discourse referentialization “identifying some entity that the speaker wants to talk  
28 about,” and (4) relationalization (“identification of a head noun before it can be  
29 modified by a possessor or a relative clause”).

30 In 2002, McGregor suggested that there is no reason that classification should  
31 be restricted to noun systems in languages. McGregor proposed that verbs can also  
32 have classifier systems in which the verbal lexicon of a language is treated in a  
33 parallel fashion. Like numeral classifier systems, verb classifier systems have an  
34 association with quantification realized as aspectual distinctions (McGregor 2002:  
35 287), and there is also a parallel between the typical classification according to shape  
36 in numeral classifier systems and the function of the “shape” of the trajectory of an  
37 event (“vectorial configuration” McGregor 2002: 29). Although McGregor’s work is  
38 based on various Australian languages (Gooniyandi, Wagiman, and the Jaminjungan

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<sup>4</sup> Why Slavic would grammaticalize prefixes as lexico-grammatical unitizers for its verbs in contrast to other Indo-European branches/languages such as Baltic, Germanic or Greek (in which prefixes have not been grammaticalized as aspectual markers) is a complex diachronic question. In short, there is evidence that the complete univerbation of spatial particles and verbs combined with the loss of concrete spatial meanings by some prefixes created a unique situation in Slavic, which did not exist in the other language groups mentioned above and which led to the effects in Slavic under discussion. Unfortunately this issue cannot be addressed further here.

<sup>5</sup> Cf. Beckwith (2007: xx): “In fact, very little about classifiers is agreed on, especially regarding their grammatical category and relationship to other morphemes that carry out the same function.”

1 languages), he makes comparisons to other languages including Mandarin Chinese,  
 2 Cantonese and Hindi-Urdu, and speculates that verb classification “is not confined to  
 3 the relatively few languages in which it has been hitherto described, though the extent  
 4 of its distribution across the world’s languages remains to be charted” (McGregor  
 5 2002: 404). Both Majsak (2005: 339–345) and Plungjan (2011: 413–416) have  
 6 mentioned in passing that verb classification is observed in Slavic languages, but they  
 7 have not explored this hypothesis in any detail.<sup>6</sup>

8 At this point, the basic parallel between numeral classifiers and Slavic  
 9 perfectivizing prefixes needs to be made clear. Numeral classifiers (whether sortal or  
 10 mensural; see section 4.1) specify the counting unit for a given meaning of a noun in a  
 11 given context. Recall the transnumerality of bare nouns discussed above: as bare  
 12 nouns (even those that are interpreted as count nouns) in numeral classifier languages  
 13 lack the individuation status to be counted (cf. Lucy 2000: 330), the numeral classifier  
 14 signals that a discrete unit is referred to. That is to say, a numeral classifier  
 15 construction creates a discrete referent out of a source noun that cannot refer to a  
 16 discrete referent. For example, Mandarin Chinese *shu* is quantificationally  
 17 unspecified, i.e., ‘one [or more] book[s]’, as shown in (1) above. A classifier is  
 18 needed to specify ‘book’ as a discrete unit in a context: ‘a book’ is *yi ben shu* (‘one CL  
 19 book’). The effect of Slavic perfectivizing prefixes is entirely parallel. The vast  
 20 majority of simplex verbs express undifferentiated, non-discrete situations (activities  
 21 or states), e.g., Russian *čitat’* ‘read.IMPF’<sup>7</sup>; the addition of a prefix, which we may  
 22 likewise consider a construction (according to the tenets of Construction Grammar, as  
 23 the result is a morphologically complex word), creates a discrete unit, e.g., *pro-čitat’*  
 24 [THROUGH-read] ‘read.PF’.<sup>8</sup> Prefixed *pro-čitat’* is discrete in that it is telic (bounded).

25 We draw a comparison between Slavic verbal prefixes and numeral classifiers  
 26 instead of simply comparing the former to other systems of verb classifiers, such as  
 27 the Australian verb classifying systems described by McGregor (2002) or the East and  
 28 Southeast Asian verb classifiers described by Chao (1968), Matthews and Leung  
 29 (2004), and Paris (2013), among others. There are three reasons for this. First, the  
 30 systems of verb classifiers described by McGregor involve a broader range of  
 31 modifications of verbal meaning (vectorial configurations, Aktionsart, and valence)  
 32 that may or may not entail perfectivizing (individualizing) effects on a par with Slavic  
 33 prefixes. Second, we believe that Slavic aspectual prefixation in fact represents a  
 34 paradigm case of the individualizing/referential effects of classification in the verbal  
 35 domain, effects that have ordinarily been discussed with reference to numeral

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<sup>6</sup> The term “verb classifier” has also been used by some scholars to refer to non-aspect-based classifications of verbs, e.g. Silverstein (1986) and Gerner (2014).

<sup>7</sup> Given that such imperfective verbs can in fact contextually refer to single completed events, it seems that Slavic simplex imperfective verbs are likewise quantificationally unspecified, lending more support to the suggested the parallel between Mandarin Chinese bare nouns and Slavic simplex imperfective verbs.

<sup>8</sup> We use the following conventions to represent the prefixes, their meanings, and the aspect of verbs. Prefixes are separated from verb stems by a hyphen, as in *pro-čitat’*, where the prefix is *pro-*. In square brackets, the meanings of prefixes (sourced from extensive empirical research; cf. Janda et al., 2013 and <http://emptyprefixes.uit.no/book.htm>) are given in small caps, followed by a hyphen and the meaning of the verb stem, as in [THROUGH-read]. The gloss of each verb is supplied with an indication of its aspect as .PF for perfective and .IMPF for imperfective.

1 classifiers (cf. Bisang 1999). Third, we believe that the parallels we discuss are  
 2 relevant for the larger issue of the referential parallels between nouns and verbs  
 3 mentioned in section 2 (cf., e.g., Langacker, 1987 and Krifka, 1989).

4 The East Asian (e.g., Mandarin and Cantonese) and Southeast Asian (e.g.,  
 5 Thai) systems of verbal classification deserve comment. These systems seem to be  
 6 directly parallel to nominal numeral classifier constructions, inasmuch as they  
 7 ordinarily include a verb, a numeral, and a classifier, i.e., V + NUM + CL (cf., e.g., Chao  
 8 1968: 615–620, Matthews and Leung 2004, and Paris 2013). According to Chao  
 9 (1968), Mandarin verbal classifiers include various words expressing the number of  
 10 times (2a) and the verb itself may be repeated as a classifier (2b); otherwise, verbal  
 11 classifiers are words for body parts (2c) and instruments (2d).

- 12  
 13 (2) a. *kan san bian*  
 14 read three CL:once through  
 15 ‘read three times’  
 16  
 17 b. *kan yi kan*  
 18 read one CL:read  
 19 ‘read a little’  
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 21 c. *da liang bazhang*  
 22 hit two CL:palm  
 23 ‘slap twice’  
 24  
 25 d. *da yi qiang*  
 26 hit one CL:[shot of a] gun  
 27 ‘shoot once’  
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29 Such verbal classification apparently only occurs when there is some modification of  
 30 a predicate in terms of quantity (either delimitativity, as in [2b], or a plurality of  
 31 events [2a, c–d]), which occurs less commonly than with nouns, because situations in  
 32 time are not ordinarily counted (see below). Further, it is unclear to what extent verbal  
 33 classification is a phenomenon distinct from numeral classification in Cantonese and  
 34 Thai, as in these languages some classifiers function both as numeral and verbal  
 35 classifiers (cf. Matthews and Leung, 2004). The same phenomenon seems to exist in  
 36 Mandarin, according to Liu (2014: 69).

37 Thus, if verb classifiers in Chinese (and Thai) are part of a larger system  
 38 including numeral classifiers, then drawing parallels between numeral classifiers and  
 39 Slavic verbal prefixes may be an important part of a broader typological account.  
 40 Again, Slavic verbal prefixes as classifiers express perfectivity, individualizing events  
 41 on a par with the individualization of entities by numeral classifiers, which is a  
 42 consequence of the fact that Slavic prefixes classify events by their outcomes (see  
 43 section 3.2). Thus, while Slavic prefixes are a system of verb classifiers and are thus  
 44 comparable in a general way to other systems of verb classifiers (and Chinese and  
 45 Thai verbal classifiers seem to be very parallel to numeral classifiers in those  
 46 languages), the comparison of Slavic verbal prefixes to numeral classifiers is  
 47 nevertheless illuminating.

48 There is one potential argument against viewing Slavic verbal prefixes as  
 49 analogues of numeral classifiers: the fact that numeral classifiers prototypically occur  
 50 with numerals, whereas Slavic verb classifiers do not. We offer two counter-

1 arguments. First, numeral classifiers in many languages occur in bare classifier  
 2 constructions, i.e., constructions without a numeral (CL + N; for examples, see sections  
 3 5.4–5.5), so it is not true that numeral classifiers always occur with numerals. Second,  
 4 the fact that numeral classifiers most often occur with numerals whereas Slavic verbal  
 5 prefixes do not is a consequence of the differences between nouns and verbs: due to  
 6 their temporal stability, numerous objects of a given type can easily exist  
 7 simultaneously, whereas events, due to their instability in time, tend not to coexist in  
 8 large numbers, and if they do are perceived collectively (cf. Langacker 2008: 150–  
 9 151). Quantification is equally relevant for nouns and verbs, but takes very different  
 10 shapes due to the ontological differences between objects and events.

### 11 12 **3. Sortal Classifiers**

13 This section explores and extends the analogy between sortal numeral classifiers and  
 14 perfectivizing prefixes in Slavic languages. The point of departure is Janda’s  
 15 hypothesis that Russian “purely perfectivizing” aspectual prefixes constitute a verb  
 16 classifier system parallel to sortal classifiers in numeral classifier languages. Section  
 17 3.1 gives an overview of the genesis of and supporting arguments for this hypothesis,  
 18 which is then extended to other telic perfectives in both Russian and all other Slavic  
 19 languages in section 3.2.

#### 20 21 **3.1 Russian Natural Perfectives**

22 Janda (2012) and Janda et al. (2013), inspired by McGregor (2002), present the  
 23 hypothesis that the prefixes that Russian uses to form perfective aspectual partner  
 24 verbs (also known as Natural Perfectives, cf. Janda, 2007), as in *pisat* ‘write.IMPF’ >  
 25 *na-pisat* [SURFACE-write] ‘write.PF’, *varit* ‘cook.IMPF’ > *s-varit* [TOGETHER-cook]  
 26 ‘cook.PF’ serve as lexico-grammatical unitizers, parallel to numeral classifiers. In  
 27 other words, the Russian prefixes unitize and classify events in a way that is parallel  
 28 to the way that numeral classifiers unitize and classify objects. Numeral classifiers are  
 29 typically associated with numerals, and Russian aspectual prefixes are associated with  
 30 perfective aspect, which has a quantifying function. Numeral classifiers often classify  
 31 objects according to shape, and the verbal parallel is the trajector-landmark relation  
 32 expressed by prefixes, such as Russian *na-* [SURFACE-], *vy-* [OUT OF A CONTAINER-],  
 33 where the trajectory of the action is located relative to landmarks such as surfaces and  
 34 containers. Note that in spatial motion predicates, e.g., *vy-nesti* [OUT OF A CONTAINER-  
 35 carry] *korobku iz komnaty* ‘carry.PF a box out of a room’ trajector-landmark  
 36 relationships among the arguments of the verb are quite clear. In other cases, they are  
 37 less so, and often metonymy is involved, e.g., with *vy-mesti* [OUT OF A CONTAINER-  
 38 sweep] *komnatu* ‘sweep out.PF a room’. In this case the room does not exit a  
 39 container, rather the dust ends up out of the room. In such metonymic cases, the  
 40 prefix signals the particular trajector-landmark relationship of the result (e.g.,  
 41 something ending up out of a room), though the roles of trajector and landmark differ.  
 42 In other cases, more abstract, non-spatial meanings gain prominence, e.g., *po-xudet*  
 43 [RESULT-lose weight] ‘lose weight.PF’. All three semantic mechanisms can be attested  
 44 to varying degrees with most Russian prefixes. It is important to point out that with  
 45 the exception of abstract, non-spatial meanings, the trajectory-landmark relationships  
 46 expressed by prefixes profile and thus classify the **outcome** of the situation, as  
 47 opposed to its process.

<b>Unitizer Type:</b>	Numeral Classifiers	Aspectual Prefixes
<b>Quantification:</b>	Associated with numerals	Associated with Perfective Aspect
<b>Spatial Profile:</b>	BOUNDED/SHAPED REGION IN SPACE	TRAJECTOR-LANDMARK RELATION
<b>Etymological Source:</b>	Stem from nouns	Stem from prepositions/pre-words

1 Table 1: Lexico-Grammatical Unitizers for Nouns vs. Verbs

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Table 1 summarizes some of the parallels that motivate the Russian verb classifier hypothesis, elaborated in detail below. We observe that both nouns and verbs can be classified by means of lexico-grammatical unitizers that refer to spatial configurations and express bounded units either as discrete objects or as discrete events.

Janda's hypothesis that Russian "purely perfectivizing" aspectual prefixes are in fact a system of verb classifiers is a natural outgrowth of two ideas that have dominated her work on Russian aspect. The first, detailed in Janda, 2003 and 2004, is that the profile of unbounded situations expressed by a Russian simplex imperfective verb is a verbal analogue to the profile expressed by a mass noun, which is that of a region not specifically bounded in its domain; likewise, the profile of a bounded situation expressed by a Russian perfective verb is a verbal analogue to the profile expressed by a count noun, which is that of a region that is bounded in its domain. However, there are differences: the basic cognitive domain of the situations profiled by verbs is that of time, whereas the domain of the entities profiled by nouns is that of space. The second is the idea that, contrary to dominant traditional assumptions, the so-called "purely perfectivizing" prefixes are not semantically "empty", but instead reveal (with a few necessary gaps) the same system of meanings found among prefixes when they are used to derive lexically distinct verbs (also known as Specialized Perfectives).

Though the idea that there might be an overlap between the meanings of "lexical" and "purely perfectivizing" prefixes has been around at least since Vey (1952, with reference to Czech) and van Schooneveld (1958), the majority of scholars have supported the traditional interpretation according to which certain Russian perfectivizing prefixes are lexically "empty," functioning only to perfectivize a verb (cf., e.g., Avilova, 1959 and 1976; Čertkova, 1996; Forsyth, 1970; Mironova, 2004; Šaxmatov, 1952; Švedova et al., 1980; Tixonov, 1964 and 1998; Vinogradov, 1972). There has as yet been no definitive solution to the issue of the "empty prefixes" (cf. Krongauz, 1998). Janda (2012) and Janda et al. (2013) contribute to this debate extensive statistical analyses of all prefixes that form Natural Perfectives, making it much more difficult to maintain the traditional position that the Russian "purely perfectivizing" prefixes are lexically empty.

Janda shows that the Russian "purely perfectivizing" prefixes meet both the distributional and the behavioral criteria set for verb classifiers by McGregor (2002: 16–22), namely that: (i) there are restrictions on how classifiers and classifieds co-occur, that (ii) there must be more than one classifier and (iii) more classifieds than classifiers, and that (iv) the groups of classifieds should be significantly different from each other and display different behaviors. Five statistical analyses chart the semantic,

1 syntactic, and derivational behavior of the prefixes found in Natural Perfectives in  
2 Russian.<sup>9</sup>

3 Almost all of the prefixes that function as “empty perfectivizers” in Russian  
4 Natural Perfectives also have lexical meanings when they form Specialized  
5 Perfectives from certain verbs. Janda’s investigations began with the spatial and  
6 lexical meanings of the prefixes that are relatively infrequent as perfectivizers in  
7 Russian (*v-* [INTO-], *pod-* [APPLY TO BOTTOM-], *pere-* [TRANSFER-], *pri-* [ARRIVE-], *ot-*  
8 [DEPART-], *v(o)z-* [MOVE UPWARD-], *u-* [MOVE AWAY-], *iz-* [OUT OF A CONTAINER-],  
9 *raz-* [APART-], *vy-* [OUT OF A CONTAINER-], *o(b)-* [AROUND-]) and mapped out radial  
10 semantic networks for each. A lexical analysis showed that the meanings of simplex  
11 imperfective verbs that form Natural Perfectives with these prefixes are compatible  
12 with the lexical meanings independently established for the same prefixes. There is  
13 thus good reason to assume that in the Natural Perfectives formed by these prefixes,  
14 the established lexical meanings of these prefixes overlap with the meanings of the  
15 source verbs in question.

16 The second study focused on the remaining five prefixes, all of which are  
17 highly frequent, and thus more amenable to a statistical analysis (via chi-square  
18 coupled with effect size): *pro-* [THROUGH-], *na-* [ONTO-], *za-* [CHANGE TO A FIXED  
19 STATE-], *s-* [TOGETHER-], *po-* [RESULT-]. This study explored statistical relationships  
20 between the semantic tags independently assigned to Natural Perfectives in the RNC  
21 and the prefixes. These data show that each prefix has a unique semantic profile and  
22 combines with verbs that form characteristic semantic groups. The remaining three  
23 studies lend further support to the argument that each prefix behaves differently when  
24 forming Natural Perfectives, in that different prefixes are associated with different  
25 distributions of grammatical constructions, prefix variation, and formation of  
26 secondary imperfectives.

27 In sum, these studies demonstrate that each of the prefixes associated with the  
28 formation of Natural Perfectives has a unique semantic profile. With the exception of  
29 *po-* [RESULT-], the semantic profile of each prefix makes reference to a spatial path,  
30 usually most salient in corresponding prefixed Specialized Perfective verbs of motion.  
31 In other words, for example, the spatial profile of the prefix *vy-* [OUT OF A  
32 CONTAINER-] as found in the Specialized Perfective *vy-jti* [OUT OF A CONTAINER-walk]  
33 ‘exit, walk out of.PF’ is the same profile as found in corresponding Natural Perfectives  
34 like *vy-polot’* [OUT OF A CONTAINER-pull weeds] ‘pull weeds.PF’. However, in the  
35 latter verb, the meaning of the base verb and the prefix overlap, since both signal  
36 [OUT OF A CONTAINER].

37 The statistical studies take the status of the “purely perfectivizing” prefixes in  
38 Russian beyond the realm of polemical debate by presenting extensive corpus data to  
39 make a compelling case that these prefixes are not semantically empty formal markers  
40 as previously assumed. In addition to rejecting the traditional account, we are offered  
41 a replacement, namely that the prefixes function as verb classifiers. Parallel to  
42 numeral classifiers, prefixes in Russian Natural Perfectives sort imperfective base

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<sup>9</sup> All five studies are based on data from the Russian National Corpus ([www.ruscopora.ru](http://www.ruscopora.ru), henceforth RNC) and the Exploring Emptiness database found at <http://emptyprefixes.uit.no>. The Exploring Emptiness database presents a comprehensive list of verbs that form Natural Perfectives via prefixation in Russian. In all there are sixteen prefixes that derive Natural Perfectives in Russian. All of the data and results from the five studies described below are available at this website: <http://emptyprefixes.uit.no/book.htm>.



1 verbs into semantic groups according to trajectory, the verbal analogue of shape, and  
 2 fulfill the criteria for identifying classifiers specified by McGregor (2002: 18–19).  
 3 The comparison with classifiers offers a new way to interpret the role of Russian  
 4 prefixes and opens up opportunities for typological comparisons.

5 While the purview of these studies was limited to Russian Natural Perfectives,  
 6 this does not necessarily limit the potential application of the verb classifier  
 7 hypothesis. In the following section we extend the hypothesis first to Russian  
 8 Specialized Perfectives and then to telic Perfectives in Slavic in general.

### 10 3.2 Russian Specialized Perfectives and Telic Perfectives in Slavic

11 All of the prefixes that form Natural Perfectives in Russian also form Specialized  
 12 Perfectives in which the lexical meaning of the prefix does not overlap significantly  
 13 with the meaning of the base imperfective and therefore creates a new lexeme.  
 14 Examples in Table 2 compare some Natural Perfectives with Specialized Perfectives  
 15 for two of the meanings of the prefix *raz-*: [SWELL-] and [APART-]. Overlap is a  
 16 gradient phenomenon, and the table indicates where dictionaries of Russian tend to set  
 17 the boundary between Natural Perfectives and Specialized Perfectives.

	Meaning of <i>raz-</i> : [SWELL-]		Meaning of <i>raz-</i> : [APART-]	
	Prefixed Perfective	Imperfective Base	Prefixed Perfective	Imperfective Base
<b>Natural Perfectives</b> (high semantic overlap between prefix and imperfective base verb)	<i>raz-puxnut'</i> [SWELL-swell] 'swell.PF'	<i>puxnut'</i> 'swell.IMPF'	<i>raz-gryzt'</i> [APART-gnaw] 'gnaw.PF'	<i>gryzt'</i> 'gnaw.IMPF'
	<i>raz-tolstet'</i> [SWELL-get fat] 'get fat.PF'	<i>tolstet'</i> 'get fat.IMPF'	<i>raz-bit'</i> [APART-break] 'break.PF'	<i>bit'</i> 'break.IMPF'
	<i>raz-bogatet'</i> [SWELL-get rich] 'get rich.PF'	<i>bogatet'</i> 'get rich.IMPF'	<i>raz-rezat'</i> [APART-slice] 'slice.PF'	<i>rezat'</i> 'slice.IMPF'
<b>Specialized Perfectives</b> (low or no semantic overlap between prefix and imperfective base verb)	<i>raz-dut'</i> [SWELL-blow] 'inflate.PF'	<i>dut'</i> 'blow.IMPF'	<i>raz-tolkat'</i> [APART-push] 'push apart.PF'	<i>tolkat'</i> 'push.IMPF'
	<i>raz-žit'sja</i> [SWELL-live-REFL] 'get rich.PF'	<i>žit'</i> 'live.IMPF'	<i>raz-metat'</i> [APART-sweep] 'scatter.PF'	<i>metat'</i> 'sweep.IMPF'

19 Table 2: Examples of Natural and Specialized Perfectives for two meanings of  
 20 Russian prefix *raz-*: [SWELL-] and [APART-]<sup>10</sup>

21  
 22 Lexical prefixation can be incorporated into Janda's theory in a  
 23 straightforward manner, inasmuch as the difference between "purely perfectivizing"  
 24 prefixation and lexical prefixation is a matter of the degree of semantic overlap (or  
 25 lack thereof) between the meaning of a given prefix and the source verb. The "purely  
 26 perfectivizing" prefixes have a salient spatial profile even when they ostensibly  
 27 function only to perfectivize a verb, as in *raz-puxnut'* [SWELL-swell] 'swell.PF', in  
 28 which the [SWELL-] meaning of the prefix *raz-* overlaps with the meaning of the  
 29 imperfective predicate *puxnut'* 'swell.IMPF'. In the case of a Specialized Perfective,  
 30 the spatial meaning of the prefix does not overlap to any significant degree with the

<sup>10</sup> Due to voicing assimilation *raz-* is spelled *ras-* before voiceless consonants in Russian.

1 predicate expressed by the verb, as in *raz-dut*’ [SWELL-blow] ‘inflate.PF’, in which the  
 2 [SWELL-] meaning of the prefix *raz-* does not overlap with the meaning of the  
 3 imperfective predicate *dut*’ ‘blow.IMPF’, and thus a new lexical item is created, ‘swell  
 4 by blowing, inflate.PF’. This function is parallel to the derivational use of nominal  
 5 classifiers to create new lexical items (Kilarski 2013: 295-297). Despite the fact that  
 6 Specialized Perfectives create new lexical items (thus necessitating the suffixal  
 7 derivation of a new imperfective verb, here *raz-dut*’ > *raz-du-vat*’ [SWELL-blow-IMPF]  
 8 ‘inflate.IMPF’) as opposed to creating a perfective verb that is lexically equivalent to  
 9 the imperfective source verb, in both cases the prefixation performs a classifying  
 10 function: in the derivation of both perfective partner verbs and new lexical verbs,  
 11 prefixation in Russian gives spatio-temporal shape to the source predicate, i.e., it  
 12 individuates it conceptually.

13 The parallel between verbal prefixes and numeral classifiers can be made  
 14 more precise if we consider that the classification of situations is **classification by**  
 15 **outcome**. The reason for adding this specification is threefold. First, telic predicates  
 16 are goal-oriented, so the outcome is prominent. Second, the visual perception of  
 17 situations without knowledge of their goals yields only a basic-level differentiation of  
 18 situations, e.g., imperfectives like *pisat*’ ‘write.IMPF’ versus *čitat*’ ‘read.IMPF’, whereas  
 19 background knowledge of goals and other outcomes is necessary to recognize the  
 20 activity expressed by *pisat*’ ‘write.IMPF’ as various subordinate situations, e.g., *iz-*  
 21 *pisat*’ [EXHAUSTIVE RESULT-write] ‘cover with writing.PF’, *pere-pisat*’ [REDO-write]  
 22 ‘rewrite.PF’, *pro-pisat*’ [THROUGH-write] ‘prescribe.PF’, *vy-pisat*’ [OUT OF A CONTAINER-  
 23 write] ‘issue.PF’, etc. That is to say, the spatial relationship expressed by a prefix is  
 24 directly or metonymically linked with the outcome of the basic activity. Thus, with  
 25 Russian *na-pisat*’ [SURFACE-write] ‘write (to completion).PF’ the meaning of *na-*  
 26 ‘SURFACE’ characterizes the outcome (text on a surface). An example of metonymy is a  
 27 verb phrase such as *vy-čistit*’ [OUT OF A CONTAINER-clean] *konjušnju* ‘clean out.PF a  
 28 stable’ in which there is no straightforward trajector-landmark relationship, i.e., the  
 29 stable does not exit a container, but is the container from which dirt is swept out (cf.  
 30 Shull 2003: 184–185; Endresen, 2014). Third, if we assume that the mechanism at  
 31 work is classification by outcome, the perfectivizing effect of Russian prefixes is  
 32 easily accounted for: the outcome is the conceptual anchor point via which the  
 33 situation is conceptualized, thus producing a perfective verb (i.e., one that focuses on  
 34 the outcome). In this account the derivation of imperfective correlates of Specialized  
 35 Perfectives (e.g., *raz-du-vat*’ [SWELL-blow-IMPF] ‘inflate.IMPF’ < *raz-dut*’ [SWELL-  
 36 blow] ‘inflate.PF’) is a way of retaining the classification of the type of a situation  
 37 while blocking the default effect of perfectivization. The imperfectivizing suffix  
 38 achieves this by backgrounding the outcome in the meaning of the verb. In terms of  
 39 Langacker’s (2008) Cognitive Grammar, we may say that a prefixed perfective  
 40 includes the outcome in the semantic profile of the verb, whereas the derived  
 41 imperfective correlate includes the outcome not in its semantic profile (which  
 42 foregrounds the process), but in the profile base, meaning that the outcome is  
 43 accessible but not asserted. Note that this recalls a similar situation in Gooniyandi as  
 44 per McGregor (2002: 52-53).

45 In this account, Russian perfectivizing and lexical prefixes classify situations  
 46 via their outcomes. As pointed out in 3.1, the spatial configurations signaled by  
 47 prefixes profile the outcome as opposed to the process itself. This is parallel to the  
 48 function of sortal numeral classifiers, which classify objects by the relevant counting  
 49 unit (the classifying function of Bisang, 1999). The fact that verb classification in  
 50 Russian involves secondary forms (derived imperfectives) is simply a consequence of

1 the fact that the metric domain of situations is time and not space: unlike objects,  
 2 situations are not simultaneously perceivable as wholes, and a type-classification  
 3 system must allow for parts of situations (processes) to be identified as components of  
 4 various types of goal-oriented situations, a circumstance that does not arise with  
 5 physical objects, because they are simultaneously perceivable as wholes.

6 What has been said about lexical prefixation in Russian is also true of the  
 7 other Slavic languages, as illustrated in Table 3.

8

	Late Common Slavic	Russian	Polish	Czech	BCS	Bulgarian
<b>Imperfective base verb</b>	<i>pīsati</i> 'write.IMPF'	<i>pisat'</i>	<i>pisać</i>	<i>psát</i>	<i>pisati</i>	<i>piša</i>
<b>Natural Perfective</b>	<i>na-pīsati</i> [SURFACE-write] 'write.PF'	<i>na-pisat'</i>	<i>na-pisać</i>	<i>na-psat</i>	<i>na-pisati</i>	<i>na-piša</i>
<b>Specialized Perfectives</b>	<i>vī-pīsati</i> [INTO-write] 'insert.PF'	<i>v-pisat'</i>	<i>w-pisać</i>	<i>ve-psat</i>	<i>u-pisati</i>	<i>v-piša</i>
	<i>za-pīsati</i> [CHANGE TO A FIXED STATE-write] 'record.PF'	<i>za-pisat'</i>	<i>za-pisać</i>	<i>za-psat</i>	<i>za-pisati</i>	<i>za-piša</i>
	<i>podū-pīsati</i> [APPLY TO BOTTOM-write] 'sign.PF'	<i>pod-pisat'</i>	<i>pod-pisać</i>	<i>pode-psat</i>	<i>pot-pisati</i>	<i>pod-piša</i>

9 Table 3: Natural and Specialized Perfectives in Slavic Languages

10

11 For example, in the Natural Perfectives related to Late Common Slavic *na-pīsati*  
 12 [SURFACE-write] 'write.PF', the meaning of *na-* [SURFACE-] overlaps with the meaning  
 13 of the base verb *pīsati* 'write.IMPF', since writing is done on a surface. By contrast, in  
 14 the Specialized Perfectives the meanings of the other prefixes do not overlap with the  
 15 meaning of the base verb, and this necessitates the derivation of new imperfective  
 16 verbs such as Russian *v-pis-yvat'* [INTO-write-IMPF] 'insert.IMPF' (cf. Polish *w-pis-*  
 17 *ywać*, Czech *v-pis-ovat*, BCS *u-pis-ivati*, Bulgarian *v-pis-vam*<sup>11</sup>) creating a new  
 18 aspectual pair. However, the prefixation performs a classifying function in both cases,  
 19 giving the predicate in each a specific spatio-temporal shape, classifying by outcome.

20

21 The function of prefixes in the derivation not only of Natural Perfectives but  
 22 also of Specialized Perfectives in Slavic is that of verb classifiers, following the  
 23 parallels with numeral classifiers established by Janda et al. (2013). The different  
 24 effects of prefixation (forming Natural vs. Specialized Perfectives) can be  
 25 accommodated in the overall hypothesis that lexical and "purely perfectivizing"  
 26 prefixes are verb classifiers. Note that Janda et al. (2013) document a tendency even  
 27 for Natural Perfectives in Russian to derive suffixed imperfective correlates (*contra*  
 the standard descriptions of aspectual derivation). Thus, the formal distinctions are

<sup>11</sup> Note that in Bulgarian the vast majority of all prefixed perfective verbs derive suffixed imperfective verbs, regardless of the type of the prefixed perfective (Natural Perfective, Specialized Perfective, Complex Act Perfective, etc.). The test for "desemanticization" of the prefix, i.e., whether there is no lexical difference between the members of a pair, is whether the corresponding derived imperfective can be used with actual-present reference (cf. Ivanova, 1966). Note that in our view, the slightly different facts of Bulgarian do not contradict the overall approach to the meaningfulness of "purely perfectivizing" prefixes taken in Janda et al., 2013, and "purely perfectivizing" prefixation in Bulgarian is subject to the same analysis. In the case of Bulgarian *v-pis-vam* [INTO-write-IMPF] 'insert.IMPF', the derived imperfective is not restricted to non-actual present-tense usage.

1 also blurred between the two types, which is further evidence for a unified analysis of  
 2 the lexico-grammatical function of “purely perfectivizing” and specialized  
 3 prefixation.

4 In effect, extending the verb classifier hypothesis presented by Janda et al.  
 5 (2013) to prefixation in Natural and Specialized Perfectives through the Slavic  
 6 languages results in the unification of “purely perfectivizing” prefixation and  
 7 “lexical” prefixation together as subcases of lexical prefixation. If we consider a  
 8 typical Natural Perfective alongside a related Specialized Perfective, e.g., Russian *na-*  
 9 *pisat'* [SURFACE-write] ‘write.PF’ (Natural Perfective) and *pod-pisat'* [APPLY TO  
 10 BOTTOM-write] ‘sign.PF’ (Specialized Perfective), the difference is akin to that created  
 11 by different sortal classifiers, cf., e.g., Yucatec Maya ‘*un-tz’iit há’as* ‘one CL:long-  
 12 thin banana’, i.e., ‘one banana (fruit)’ and ‘*un-wáal há’as* ‘one CL:flat banana’, i.e.,  
 13 ‘one banana leaf’ (Lucy 1992: 74). In each respective case the classifier profiles a  
 14 different “shape” of the substance/situation in question, and thus individuates  
 15 different types of entities consisting of that substance/situation. However, the first  
 16 example which refers to the fruit parallels the formation of a Natural Perfective in that  
 17 it identifies the most typical unit associated with the noun *há’as* ‘banana’, whereas the  
 18 second example of the leaf, like a Specialized Perfective, refers to another possible  
 19 association. On a lexical level, Yucatec Maya sortal classifiers on the one hand, and  
 20 Slavic lexical prefixes on the other, individuate natural type units of commonly  
 21 occurring substances and situations (such as banana plants and writing, respectively).

#### 23 4. Mensural Classifiers

24 This section extends the verb classifier hypothesis to atelic perfectives in Slavic,  
 25 found primarily in East Slavic languages and Bulgarian. We begin by reviewing some  
 26 similarities and differences between sortal and mensural classifiers and then turn to  
 27 the parallels between mensural classifiers and Slavic atelic perfectives.

##### 29 4.1 Sortal vs. Mensural Classifiers

30 Numeral classifiers are often divided into two types: **sortal** classifiers and **mensural**  
 31 classifiers. A sortal classifier “individuates whatever it refers to in terms of the kind of  
 32 entity it is,” whereas a mensural quantifier “individuates in terms of quantity” (Lyons  
 33 1977: 463). Examples of Mandarin Chinese sortal and mensural classifiers with  
 34 numerals are given in Table 4, which shows the structure of classifier constructions in  
 35 Chinese.

Classifier Type	Numeral	Classifier	Noun
Sortal	<i>yi</i> one	<i>tiao</i> CL: long-thin	<i>shengzi</i> rope
Mensural	<i>yi</i> one	<i>bei</i> CL: glass	<i>pjiu</i> beer

37 Table 4: The Numeral Classifier Construction in Mandarin Chinese

39 We accept the distinction between sortal and mensural classifiers, while recognizing  
 40 that some scholars regard this distinction to be controversial. There are two  
 41 interrelated issues concerning mensural classifiers that are subject to debate and

1 relevant for our discussion: (1) whether mensural classifiers are in fact numeral  
 2 classifiers, and (2) if so, the degree to which mensural classifiers are distinct from  
 3 sortal classifiers. Regarding the first issue, some analyses equate mensural classifiers  
 4 with measure words (e.g., English *cup* in *two cups of coffee*), thus maintaining that  
 5 mensural classifiers are characteristic of most or all languages of the world. For  
 6 instance, Moravcsik (2013: 77) considers English *cup* to be a mensural classifier;  
 7 along the same line, Croft (1994) argues that measure words cannot be real classifiers  
 8 because they create units rather than referring to inherent units. According to this  
 9 approach, the only true numeral classifiers are sortal classifiers (cf. also Gil 2011;  
 10 Bisang 1999).

11 In our view, morphosyntactic criteria are crucial in resolving this issue. We  
 12 distinguish between measure terms in languages without numeral classifier systems  
 13 and mensural classifiers, which occur in numeral classifier constructions that parallel  
 14 sortal classifier constructions in classifier languages, as exemplified in Table 4 (cf.  
 15 Grinevald 2004: 1020). All languages have measure expressions; this basic fact,  
 16 however, does not justify the conclusion that all linguistic strategies for expressing  
 17 measure are identical. An argument against the view that English measure words such  
 18 as *cup* and *keg* are mensural classifiers is that measure words behave just like nouns,  
 19 obligatorily inflecting for the plural when more than one unit is involved as well as  
 20 requiring the genitive marker *of*, e.g., *two cups of coffee*. By contrast, German has  
 21 some mensural classifiers, e.g., *zwei Fass Bier* ‘two kegs of beer’ without plural  
 22 inflection or genitive marking of the classified noun.<sup>12</sup> Facts such as these lead us to  
 23 believe that only languages with distinctive constructions such as those exemplified in  
 24 Table 4 have numeral classifiers, and these include mensural classifiers.

25 Views on the second issue, the degree to which mensural classifiers are  
 26 distinct from sortal classifiers, are far from unanimous. Zhang (2013: 70–72) points  
 27 out that different studies are inconsistent in their categorization of various classifiers  
 28 as sortal or mensural. Zhang divides classifiers into five types: **collective** (e.g.,  
 29 Mandarin Chinese *zu* ‘CL:group’), **partitive** (e.g., Mandarin Chinese *pian* ‘CL:slice’),  
 30 **individual** (which basically corresponds to the prototypical kind of sortal classifiers  
 31 in most accounts; e.g., Mandarin Chinese *tiao* ‘CL:long-thin’), **individuating** (e.g.,  
 32 Mandarin Chinese *di* ‘CL:drop’) and **kind** classifiers (e.g., Mandarin Chinese *zhong*  
 33 ‘CL:sort’). As just one example, she points out that Grinevald (2002) and Rijkhoff  
 34 (1999) consider individuating classifiers to be mensural, whereas Gerner and Bisang  
 35 (2010), Velupillai (2012) and Li et al. (2010) consider them to be sortal. Killingley  
 36 (1981: 390) also points out that in Cantonese some sortal classifiers develop mensural  
 37 functions, and, similarly, mensural classifiers also tend to develop sortal functions.  
 38 Zhang (2013: 41-43) gives examples of this phenomenon from Mandarin Chinese  
 39 with the classifier *pian* (glossed as ‘slice’), as shown in (3):

- 40  
 41 (3) a. *san pian shuye* (individual/sortal classifier)  
 42 three CL:slice leaf  
 43 ‘three leaves’  
 44  
 45 b. *yi pian qiche* (collective/mensural classifier)

<sup>12</sup> Contrast this with the use of the corresponding measure word in *zwei Fässer Bier* ‘two kegs [full] of beer’. Note however, that the ability of feminine nouns to occur without plural marking in this construction is very uneven, cf. *zwei \*Kiste/Kisten Bier* ‘two crates of beer’ *zwei \*Tüte/Tüten Brausepulver* ‘two packets of sherbet powder’.

- 1           one    CL:slice    car  
 2           ‘one group of cars’  
 3  
 4           c.    *san pian mutou* (individuating/mensural classifier)  
 5           three CL:slice wood  
 6           ‘three pieces of wood’  
 7  
 8           d.    *shi pian luobo* (partitive/mensural classifier)  
 9           ten    CL:slice carrot  
 10          ‘ten slices of carrot’  
 11

12 Only (3a) is described as sortal because only in this example do we see that the  
 13 classifier refers to an inherent property of the classified: a leaf is inherently flat and  
 14 thus compatible with the classifier *pian* meaning ‘slice’. In the remaining examples  
 15 we see that the classifier is used to impose quantitative units.

16 The ability of a single classifier to take on alternately sortal and mensural  
 17 functions indicates that there is a single system of classification with two subtypes of  
 18 classifiers in Chinese, as opposed to a system of sortal classifiers and a universal,  
 19 non-classifier category of measure words. Interestingly, Yip (2008) argues that there  
 20 are also morphosyntactic differences between **true measures** (e.g., *gongjin*  
 21 ‘kilogram’) on the one hand, and both sortal and mensural quantifiers on the other  
 22 (e.g., *ba* ‘CL:handle’ and *bui* ‘CL:cup’, respectively), most importantly that bare  
 23 classifier constructions (see sections 5.4-5.5) occur in Chinese with both sortal and  
 24 mensural classifiers, but not with true measures.

25 There are other arguments against drawing a sharp distinction between sortal  
 26 and mensural classifiers in Mandarin Chinese. One involves *de*-insertion in classifier  
 27 phrases and adjective preposing before classifiers, which, according to Cheng and  
 28 Sybesma (1999: 515–516; cf. also the references cited there), can be used to  
 29 distinguish between sortal and mensural classifiers. Thus, it is claimed that the  
 30 modificational marker *de* can be inserted in a mensural classifier phrase but not a  
 31 sortal classifier phrase, cf., e.g., *liang xiang (de) shu* ‘two CL-box DE book’ versus *shi*  
 32 *zhang (\*de) zhuozi* ‘ten CL DE table’. Likewise, it is claimed that certain adjectives  
 33 (e.g., *da* ‘big’, *xiao* ‘small’) can modify mensural classifiers but not sortal classifiers,  
 34 cf., e.g., *na yi xiao xiang shu* ‘that one small CL-box book’ versus *\*yi da zhi gou* ‘one  
 35 big CL dog’. However, Zhang (2013: 78–80) considers these two tests problematic,  
 36 because the modificational marker *de* can be inserted into sortal classifier  
 37 constructions in certain contexts (cf., e.g., *yi liang tia de maojin* ‘one [or] two CL DE  
 38 towel’. Likewise, she points out that adjectives can be preposed before some sortal  
 39 classifiers, as in *san da zhi laohu* ‘three big CL tiger’. She thus concludes that the  
 40 claim that mensural but not sortal classifiers can be followed by *de* and modified by  
 41 adjectives is “descriptively inadequate” (80).

42 Further, the idea that mensural classifiers are structurally distinct from sortal  
 43 classifiers because they do not sort nouns according to semantic types runs into  
 44 problems when one recalls that the general sortal classifier *ge* does not sort count  
 45 nouns into a semantic type, but simply signals that the inherent unit of a given count  
 46 noun is the counting unit.<sup>13</sup> As Zhang (2013: 74) observes, “[i]f CLs are disjunctively  
 47 specified into either sortal or mensural, the status of *ge* is not clear” and that if *ge*, the

<sup>13</sup> The same argument applies to other languages with general classifiers, e.g.,  
 Yucatec Maya and Persian.

1 most frequently used classifier in Mandarin Chinese is problematic for a theory of  
2 classifiers, “the theory does not seem to be convincing.”

3 In view of the above, it may be difficult in some cases to reliably distinguish  
4 between sortal and mensural classifiers, which suggests that in languages with  
5 classifier constructions there is a continuum between classifiers that are clearly sortal  
6 and those that are clearly mensural, but both are equally classifiers (cf. Zhang 2013).  
7 The aforementioned problems with distinguishing between the two and the overall  
8 structural identity shown in Table 4 likewise led Lucy (2000: 332) to argue that in  
9 many cases the division between sortal and mensural classifiers is artificial:

10  
11 “In most accounts sortal classifiers are few in number and operate over  
12 discrete referents. Mensural classifiers are many in number and operate  
13 over amorphous referents. Alternatively, a distinction is drawn between  
14 true classifiers that create disjunct groupings based on the inherent  
15 semantic values of nouns (or their referents) and mere quantifiers that  
16 combine fairly freely with nouns. Rarely, however, do the linguistic facts  
17 justify such divisions. Typically no morpho-syntactic difference is  
18 identified between the two types of classifiers and, from the point of view  
19 of meaning, both types specify units.”

20  
21 Beckwith (2007: 3–4) is of the same basic opinion: “in most languages the division of  
22 classifiers into two types [i.e., sortal and mensural—Dickey & Janda] is only  
23 marginally discernable, if it exists at all.”

24 Lucy (1992: 76) further points out that in Yucatec Maya there are not only  
25 sortal general classifiers (*-tíul* for animates and *-p'éel* for inanimates) on a par with  
26 Mandarin Chinese *ge*, but also a general mensural classifier *-p'ít* ‘a little, few’,  
27 “which can be used in almost every case where mensural classifiers could be used.”  
28 The flexibility and identical structure are shown in the examples in (4):

- 29  
30 (4) a. *'un- tíul k'éeken*  
31 one CL:animate pig  
32 ‘one/a [live] pig’  
33  
34 b. *'um- p'éel k'éeken*  
35 one CL:inanimate pig  
36 ‘one/a whole pig [dead or alive]’  
37  
38 c. *'um- p'ít k'éeken*  
39 one CL:some pig  
40 ‘a little bit of/some pork’  
41

42 Similarly, the general classifier in Persian *ta* occurs with both count nouns and mass  
43 nouns, i.e., it functions both as a sortal and as a mensural classifier (Zhang 2013: 74).

44 We conclude that in classifier languages, mensural classifiers are a kind of  
45 classifier (as opposed to being ordinary nominal measure terms, which exist in all  
46 languages). By the same token, it is often difficult to draw a sharp distinction between  
47 sortal and mensural classifiers in classifier languages. The details mentioned here are  
48 crucial to the comparison between Slavic atelic perfectivizing prefixes and mensural  
49 classifiers, presented in the following two sections.

50

## 1 4.2 Atelic Perfectives in Slavic

2 The hypothesis that Slavic lexical prefixation is a system of verb classification  
3 naturally motivates the question as to whether Slavic languages have an analogue to  
4 mensural classifiers in their system of verbal prefixation. Our answer is that the  
5 systems of procedural prefixation in East Slavic and Bulgarian are in fact such  
6 analogues.

7 It is often pointed out that Russian aspectual prefixes can behave in two ways:  
8 1) as “lexical” prefixes in which case they are telic (cf. the Natural and Specialized  
9 Perfectives described above), or 2) as “superlexical” prefixes that are atelic, providing  
10 quantificational or phasal boundaries for an action (Ramchand, 2004; Svenonius,  
11 2004a-b, 2008; cf. Complex Act and Single Act Perfectives in Janda, 2007). *Mutatis*  
12 *mutandis*, Bulgarian exhibits the same distinction. Perfectives derived via superlexical  
13 prefixation, such as the delimitatives in example (6) below, are also referred to as  
14 Aktionsarten and procedurals. In this article we use the latter term and argue that  
15 procedural prefixes behave as the verbal analogues of mensural classifiers. The  
16 parallels relevant for this argument are summarized in Table 5.

	<b>Nouns</b>	<b>Verbs</b>
<b>Unitizer Type:</b>	Numeral Classifiers	Aspectual Prefixes
<b>Reference to inherent boundaries:</b>	Sortal Classifiers	Lexical + purely perfectivizing prefixes (Natural Perfectives and Specialized Perfectives)
<b>Imposition of external boundaries:</b>	Mensural Classifiers	Procedural prefixes, a.k.a. Superlexical, Aktionsart prefixes (Complex Act Perfectives and Single Act Perfectives)

18 Table 5: Lexico-Grammatical Unitizers for Nouns vs. Verbs

19  
20 The overall point is quite simple: in numeral classifier systems, mensural classifiers  
21 individuate “in terms of quantity” (Lyons 1977: 463), and the verbal analogues of  
22 such quantifying individuation in Russian and Bulgarian are their relatively rich  
23 systems of procedural prefixation. As an illustration, consider the following phrases  
24 with mensural classifiers:

- 25  
26 (5) a. *yi bei pijiu* (Mandarin Chinese; Gao and Malt 2009: 1129)  
27 one CL:glass beer  
28 ‘a glass of beer’  
29  
30 b. *'um- p'it há'as* (Yucatec Maya; Lucy 1992: 74)  
31 a CL:little-bit/some banana  
32 ‘a little bit of/some banana’  
33

34 The quantitative individuation of substances expressed by the mensural classifiers in  
35 such usage is semantically parallel to the quantitative individuation expressed by  
36 delimitative *po-* in Russian and Bulgarian, exemplified in (6a–b):

- 37  
38 (6) a. *po-sidet'* (Russian)  
39 [SOME-sit]  
40 ‘sit for a while.PF’  
41



- 1           b. *po-sedna* (Bulgarian)  
2           [SOME-sit]  
3           ‘sit for a while.PF’  
4

5 Here it is important to emphasize that delimitative *po-* [SOME-] is extremely  
6 productive in Russian and also quite productive in Bulgarian (for discussion, cf.  
7 Dickey, 2007 and 2012), to the point that the great majority of atelic activity verbs  
8 derive delimitatives in *po-* [SOME-]. Due to its high productivity as a delimitative  
9 prefix, *po-* appears to be a kind of general perfectivizing prefix for atelic predicates in  
10 Russian and Bulgarian,<sup>14</sup> comparable to the Yucatec Maya general mensural classifier  
11 *-p’iit* ‘a little, few’ or the Persian general mensural (and sortal) classifier *ta*.

12 Four of the five types of Mandarin Chinese numeral classifiers identified by  
13 Zhang (2013; see our section 4.1) find fairly straightforward analogues in types of  
14 Russian and Bulgarian perfectivizing prefixes when one takes procedural prefixes into  
15 consideration. The differences between the various types of Mandarin Chinese  
16 numeral classifiers and Russian and Bulgarian perfectivizing prefixes can be ascribed  
17 to the overall differences between nouns, which prototypically profile time-stable  
18 entities in three-dimensional space, as opposed to verbs, which profile situations in  
19 time.  
20

Type of Mandarin Chinese Numeral classifier	Analogues Among Russian Perfectivizing Prefixes	Analogues Among Bulgarian Perfectivizing Prefixes
(1) INDIVIDUAL CLASSIFIERS (SORTAL) <i>yi zhi bi</i> ‘a pen (for writing)’ <i>yi ge juzi</i> ‘an orange’	NATURAL: <i>po-</i> [RESULT-], <i>s-</i> [TOGETHER-], <i>za-</i> [CHANGE TO A FIXED STATE-], etc. SPECIALIZED: <i>do-</i> [REACH-], <i>s-</i> [TOGETHER-], <i>za-</i> [COVER-], etc.	NATURAL: <i>iz-</i> [EXHAUSTIVE RESULT-], <i>na-</i> [SURFACE-], <i>po-</i> [RESULT-], etc. SPECIALIZED: <i>do-</i> [REACH-], <i>s-</i> [TOGETHER-], <i>za-</i> [COVER-], etc.
(2) COLLECTIVE CLASSIFIERS (MENSURAL) <i>yi qun mianyang</i> ‘a flock of sheep’	DISTRIBUTIVE: <i>pere-</i> [SERIATIM-], <i>po-</i> [DISTRIBUTE-] CUMULATIVE: <i>na-</i> [ACCUMULATE-]	DISTRIBUTIVE: <i>iz-</i> [DISTRIBUTE-] CUMULATIVE: <i>na-</i> [ACCUMULATE-]
(3) INDIVIDUATING CLASSIFIERS (MENSURAL) <i>yi bei pijiu</i> ‘a glass of beer’	DELIMITATIVE: <i>po-</i> [SOME-] PERDURATIVE: <i>pro-</i> [DURATION-] ATTENUATIVE: <i>pri-</i> [ATTENUATE-], <i>pod-</i> [MINIMAL-] INGRESSIVE: <i>za-</i> [BEGIN-] FINITIVE: <i>ot-</i> [STOP AT THE ENDPOINT-] INTENSIVE-RESULTATIVE: <i>do-...-sja</i> [EXCESS-], <i>za-...-sja</i> [EXCESS-], etc.	DELIMITATIVE: <i>po-</i> [SOME-] INGRESSIVE: <i>za-</i> [BEGIN-] ATTENUATIVE: <i>po-</i> [ATTENUATE-], <i>pod-</i> [MINIMAL-]
(4) PARTITIVE CLASSIFIERS (MENSURAL)	SEMELFACTIVE: <i>s-</i> [ONCE-], <i>-nu</i> [-ONE TIME]	SEMELFACTIVE: <i>iz-</i> [ONCE-], <i>pro-</i> [ONCE-], <i>-na</i> [-ONE TIME]

<sup>14</sup> The same is true about *po-* [SOME-] in Polish, cf. Dickey, 2005. Examples of Polish delimitatives include *po-biegać* [SOME-run] ‘run for a while.PF’, *po-myśleć* [SOME-think] ‘think for a while.PF’.

<i>shi pian luobo</i> 'ten slices of carrot'		
---	--	--

1 Table 6a: Semantic Parallels between Mandarin Chinese Numeral Classifiers  
2 and Perfectivizing Prefixes in Russian and Bulgarian

3

Terms	Definitions	Russian examples
DISTRIBUTIVE	action affecting many items one after another	<i>pere-probovat'</i> [SERIATIM-try] 'try many things.PF' <i>po-brosat'</i> [DISTRIBUTE-throw] 'throw many things.PF'
CUMULATIVE	large quantity of action	<i>na-grešit'</i> [ACCUMULATE-sin] 'do a lot of sinning.PF'
DELIMITATIVE	some action, for a while	<i>po-sidet'</i> [SOME-sit] 'sit for a while.PF'
PERDURATIVE	action through a period of time	<i>pro-plakat'</i> [DURATION-cry] ( <i>vsju noč'</i> ) 'cry all through.PF (the night)'
ATTENUATIVE	small quantity of action	<i>pri-tormozit'</i> [ATTENUATE-brake] 'brake slightly.PF' <i>pod-soxnut'</i> [MINIMAL-get dry] 'get dry a little.PF'
INGRESSIVE	initiation of action	<i>za-govorit'</i> [BEGIN-speak] 'begin to speak.PF'
FINITIVE	cessation of action	<i>ot-služit'</i> [STOP AT THE ENDPOINT-serve] 'finish a tour of duty or church service.PF'
INTENSIVE-RESULTATIVE	intensive action that leads to undesirable effects	<i>do-pljasat'-sja</i> [EXCESS-dance-REFL] 'dance one's feet off.PF' <i>za-rabotat'-sja</i> [EXCESS-work-REFL] 'overwork oneself.PF'
SEMELFACTIVE	action performed just once	<i>s-glupit'</i> [ONCE-act stupid] 'do one stupid thing.PF' <i>čix-nut'</i> [sneeze-ONE TIME] 'sneeze once.PF'

4 Table 6b: Terms and examples illustrating parallels in Table 6a<sup>15</sup>

5

6 The individual classifiers in row (1) of Table 6a are the sortal classifiers that refer to  
7 objects that have natural boundaries just as the Natural and Specialized Perfectives in  
8 Russian and Bulgarian refer to the verbal analogue of bounded objects, namely telic  
9 events, as in Russian *na-pisat'* [SURFACE-write] 'write (to completion).PF' and *za-*  
10 *pisat'* [CHANGE TO A FIXED STATE-write] 'record.PF'. The remaining three types of  
11 Chinese classifiers are mensural and correspond to perfectivizing morphemes in  
12 Russian and Bulgarian that perfectivize atelic processes.

13 The perfectives referred to in rows (2) and (3) in the table are all of the  
14 Complex Act type. Collective classifiers in row (2) refer to groups of objects,  
15 rendering a number of individuals as a mass. Similarly, distributive and cumulative  
16 perfectivizing prefixes in Russian and Bulgarian generalize over either many repeated  
17 events or the accumulation of a repetitive process, rendering a mass conceived of as a  
18 single entity. We see this in examples like Russian *pere-bit'* [SERIATIM-break] 'break  
19 (all the dishes, etc.).PF' and *na-kupit'* [ACCUMULATE-buy] 'buy a lot of.PF'.

20 Individuating classifiers in row (3) are mensural classifiers that refer to a  
21 typical unit of a mass; beer, for example, is typically portioned out by the glass. Most  
22 Russian and Bulgarian atelic processes can be likewise portioned out in typical  
23 episodic quantities by means of delimitative, perdurative, and attenuative prefixes, as  
24 in Russian *po-sidet'* [SOME-sit] 'sit for a while.PF', *pro-plakat'* [DURATION-cry] 'cry  
25 for a given period.PF', and *pri-tormozit'* [ATTENUATE-brake] 'brake slightly.PF'.  
26 Additionally, Russian makes use of ingressive, finitive, and intensive-resultative  
27 prefixation, specifying only the initial or final portion of a process, as in *za-govorit'*  
28 [BEGIN-speak] 'begin to speak.PF', *ot-služit'* [STOP AT THE ENDPOINT-serve] 'finish a  
29 tour of duty or church service.PF', and *do-pljasat'-sja* [EXCESS-dance-REFL] 'dance  
30 one's feet off.PF'. This further option is naturally available only to verbs because of

<sup>15</sup> Meanings of the prefixes are analyzed in detail in Janda et al., 2013.

1 the structure of events, which have beginnings and ends. The gap among numeral  
 2 classifiers that lack corresponding semantics is expected because physical objects do  
 3 not have beginnings and ends, but come as wholes—there is ordinarily little need to  
 4 view only one edge of an object as a discrete entity.

5 Finally, the partitive classifiers in row (4) cut up masses into discrete small  
 6 units, such as slices or particles. Semelfactive prefixes, which form Single Act  
 7 Perfectives, perform an analogous role in Russian and Bulgarian, extracting a single  
 8 subevent from a series (or potential series) of events. Here, in addition to the prefix *s-*  
 9 [ONCE] for Russian, which takes for example the continuous process of *glupit* ‘act  
 10 stupid.IMPF’ and extracts *s-glupit* [ONCE-act stupid] ‘do one stupid thing.PF’, we also  
 11 include the perfectivizing suffix *-nu*, as in *čix-nut* [sneeze-ONE TIME] ‘sneeze  
 12 once.PF’ from *čixat* ‘sneeze (continuously).IMPF’.<sup>16</sup>

### 14 4.3 Summary of Parallels to Classifiers in Slavic

15 Dickey (2000) proposes a geographical division among Slavic languages with regard  
 16 to verbal aspect, according to which there are two aspectual types: an eastern type  
 17 (consisting of Russian, Ukrainian, Belarusian and Bulgarian), a western type  
 18 (consisting of Czech, Slovak, Sorbian and Slovene), and two transitional zones  
 19 (Polish in the north, and Bosnian/Croatian/Serbian in the south). The languages of the  
 20 western type make aspectual distinctions based on totality/boundedness; in contrast,  
 21 the languages of the eastern type make aspectual distinctions based on temporal  
 22 definiteness (a notion borrowed from Leinonen, 1982). Temporal definiteness refers  
 23 to the construal of a situation as uniquely located in the fact structure of a discourse;  
 24 this has as a practical effect the limitation of perfective verbs in the eastern languages  
 25 to contexts of (*explicit* or *implicit*) sequentiality. As temporal definiteness is a more  
 26 complex category than totality, perfective verbs in the eastern languages have a more  
 27 restricted range of usage than do perfective verbs in the western languages. Polish and  
 28 BCS occupy an intermediate zone in this continuum, showing evidence of both types  
 29 of distinctions. Dickey’s geographical distribution, originally established on the basis  
 30 of differences in the use of perfective vs. imperfective aspect in a range of different  
 31 constructions (historical present, habitual sequences, nominalization) across the  
 32 Slavic languages, is relevant also for the distribution of sortal-like and mensural-like  
 33 verbal prefixes in Slavic. All Slavic languages have lexical prefixes (that form Natural  
 34 and Specialized Perfectives) that parallel sortal numeral classifiers. In addition, the  
 35 eastern languages that have a temporal definiteness distinction are productive in the  
 36 formation of procedural perfectives, and those languages therefore have mensural-like  
 37 verbal prefixes in addition to the sortal-like prefixes that are found in all Slavic  
 38 languages.

39 We suggest that the east-west division in Slavic parallels patterns of numeral  
 40 classification in numeral classifier languages. Although the prototypical classifier  
 41 languages are rich in both sortal and mensural classifiers, there are classifier  
 42 languages in which there are primarily or exclusively sortal classifiers, with few or no  
 43 mensural classifiers. For example, according to Aikhenvald (1998: 298–299), the

---

<sup>16</sup> Suffixation with reflexes of the Common Slavic nasal suffix *-nq-* is the only significant exception to the rule that prefixes mark perfectivity in Slavic. For a semantic analysis of semelfactive verbs, see Nessel, 2013. This exception can likewise be treated as a case of suffixal classification. The nasal suffix has slightly different functions in some Slavic languages, e.g., Czech, where it is closer to a default perfective marker (cf. Hilchey, 2014).

1 Anamoim dialect of Warekena (spoken in Brazil) has a system of six classifiers based  
 2 on the semantic features indicated, and of these five are sortal and only one is  
 3 mensural, as shown in Table 7:  
 4

Semantics	Classifier collocating with 'one'	Classifier collocating with 'two'	Type
human masculine	<i>peya</i>	<i>enaba</i>	sortal
human feminine	<i>peya</i>	<i>tuwanaba</i>	sortal
animals	<i>amiña</i>	<i>pamiñanaba</i>	sortal
fish	<i>pe.leya.lu</i>	<i>elenaba</i>	sortal
curvilinear objects	<i>papu.lia.luni</i>	<i>enaba</i>	sortal
periods of time	<i>babuya</i>	<i>bunaba</i>	mensural

5 Table 7: Classifiers in the Anamoim dialect of Warekena  
 6

7 Another case is Purépecha (spoken in Mexico; Vázquez, 2012), which for the past  
 8 few centuries has only had three sortal classifiers, as shown in the table.  
 9

Semantics	Classifier	Type of Classifier
elongated objects/general classifier	<i>ichákwa</i>	sortal
flat objects	<i>ichúkwa</i>	sortal
round objects	<i>erhákwa</i>	sortal

10 Table 8: Classifiers in Purépecha (adapted from Vázquez 2012: 85–87)  
 11

12 Thus, as summarized in Table 9, we can say that there are two kinds of unitizer  
 13 systems among the Slavic languages. One system parallels what is found in languages  
 14 like the Anamoim dialect of Warekena and Purépecha that have almost exclusively  
 15 sortal numeral classifiers. Like these languages, Czech, Slovak, BCS, and Slovene  
 16 have lexical and purely perfectivizing prefixation, but show only weakly developed  
 17 procedural prefixation. Other languages like Chinese and Yucatec Maya are rich in  
 18 both sortal and mensural classifiers, and the remaining Slavic languages in a parallel  
 19 fashion have productive procedural prefixes in addition to lexical and purely  
 20 perfectivizing prefixation. As neutral terms for the individualization by  
 21 inherent/natural units and the individualization by externally imposed units, we adopt  
 22 Bisang's (1999) terms **actualizing** and **creative** individualization (respectively).  
 23

	<b>Nouns</b>	<b>Verbs</b>
<b>Unitizer type:</b>	Numeral Classifiers	Aspectual Prefixes
<b>Languages Primarily or Exclusively Possessing Actualizing Unitizers:</b>	<i>Warekena (Anamoim), Purépecha</i> <ul style="list-style-type: none"> <li>• sortal classifiers</li> <li>• few or no mensural classifiers (quantifiers used instead)</li> </ul>	<i>Czech, Slovak, BCS, Slovene</i> <ul style="list-style-type: none"> <li>• lexical and purely perfectivizing prefixation</li> <li>• minimal procedural prefixation</li> </ul>
<b>Languages</b>	<i>Chinese, Yucatec Maya</i>	<i>East Slavic, Bulgarian, Polish,</i>

<b>Possessing Both Actualizing and Creative Unitizers:</b>	<ul style="list-style-type: none"> <li>• sortal classifiers</li> <li>• mensural classifiers</li> </ul>	<ul style="list-style-type: none"> <li>• lexical and purely perfectivizing prefixation</li> <li>• productive procedural prefixation</li> </ul>
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1 Table 9: Primarily or Exclusively Actualizing vs. Actualizing and Creative Unitizers

2

3 **5. Additional Evidence**

4 We complete the extension of the verb classifier hypothesis for Slavic prefixes by  
 5 examining several further compelling parallels between numeral classifiers and  
 6 perfectivizing prefixes that have not been presented previously. The six parts of this  
 7 section are foreshadowed in Table 10.

8

<b>Sections</b>	<b>Numeral Classifier Systems</b>	<b>Slavic Systems of Verbal Prefixation</b>
<b>5.1 Polysemous Radial Category Structure</b>	Documented for some numeral classifiers	Documented for many prefixes
<b>5.2 Construal</b>	Produces a choice of numeral classifiers for a given noun in addition to the default	Produces a choice between more than one prefixed verb in addition to the default
<b>5.3 General Lexico-Grammatical Unitizer</b>	General (bleached) numeral classifiers	Highly productive/bleached prefixes
<b>5.4 Discourse Foregrounding</b>	Foregrounding: thematic centrality/vivid description	Narrative Foregrounding: plotline
<b>5.5 Referentiality/Definiteness Effects</b>	In some languages, bare classifier constructions express definiteness	In some Slavic languages, perfective expresses temporal definiteness; in Russian, perfective can signal shared knowledge of an event
<b>5.6 Transnumerality</b>	Classifier languages tend to lack plural inflection for nouns	Slavic languages do not inflect verbs for number of objects/events

9 Table 10: Summary of Shared Traits of Numeral Classifiers and Slavic Verbal  
 10 Prefixes

11

12 The first two types of evidence explore distributional parallels in one-to-many and  
 13 many-to-one relationships between classifiers and classifieds, in which we see that  
 14 numeral classifiers and perfectivizing prefixes show similar polysemy structures and  
 15 opportunities for multiple construal, respectively. A third type of distributional  
 16 evidence is the parallel between general classifiers and generalized perfectivizers. The  
 17 effect of numeral classifiers on the discourse status of a noun has been recognized by  
 18 Aikhenvald (2000: 324). Discourse functions are explored in relation to the

1 foregrounding and definiteness effects found with numeral classifiers and Slavic  
 2 prefixes. Finally, the issue of transnumerality relates to typological and ontological  
 3 issues of numeral classifier and verb classifier systems. Note that all of these effects  
 4 are linked to perfectivization via prefixes in Slavic languages.

### 6 5.1 Polysemous Radial Category Structure

7 Both numeral classifiers and Slavic verbal prefixes have complex meanings that are  
 8 further specified in the context of the lexemes they combine with, involving greater or  
 9 lesser degrees of semantic overlap. As detailed in section 3.1, semantic overlap  
 10 motivates the choice of prefix used to form the Natural Perfective of an imperfective  
 11 base verb. But when the degree of overlap is low, other kinds of perfective verbs are  
 12 formed. This is shown in the Russian data in (7), where high overlap is found in (7a)  
 13 between writing and affecting a surface vs. (7b-c) with low overlap.

- 14  
 15 (7) a. *na-pisat'* (*dokument*) (Natural Perfective)  
 16 [SURFACE-write] (document)  
 17 'write (a document) to completion.PF'  
 18  
 19 b. *na-exat'* (*na stolb, na pešexoda*) (Specialized Perfective)  
 20 [SURFACE-drive] (on post, on pedestrian)  
 21 'hit, drive over.PF (a post, a pedestrian)'  
 22  
 23 c. *na-delat'* (*ošibok*) (cumulative Complex Act Perfective)  
 24 [ACCUMULATE-do] (mistakes)  
 25 'do/make a lot of.PF (mistakes)'<sup>17</sup>

26  
 27 Zhang (2013: 41-43) describes an entirely parallel effect of Mandarin Chinese  
 28 classifiers. Recall from section 4 that a given classifier can have different functions  
 29 with different nouns; this was shown in the examples in (3), repeated here as (8).

- 30  
 31 (8) a. *san pian shuye* (individual/sortal classifier)  
 32 three CL:slice leaf  
 33 'three leaves'  
 34  
 35 b. *yi pian qiche* (collective/mensural classifier)  
 36 one CL:slice car  
 37 'one group of cars'  
 38  
 39 c. *san pian mutou* (individuating/mensural classifier)  
 40 three CL:slice wood  
 41 'three pieces of wood'  
 42  
 43 d. *shi pian luobo* (partitive/mensural classifier)  
 44 ten CL:slice carrot  
 45 'ten slices of carrot'

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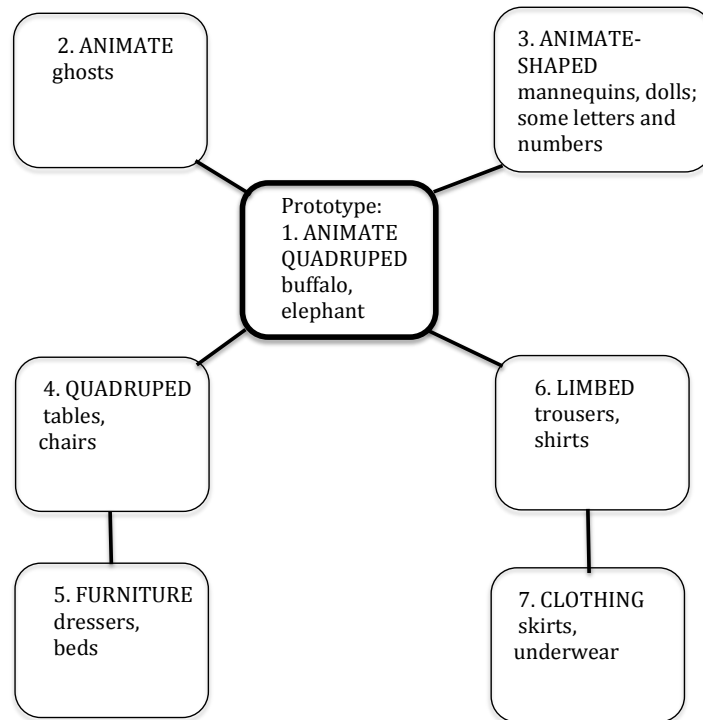
<sup>17</sup> It is important to remember that the meanings of a given prefix are related to each other. For example, for Russian *na-*, [ACCUMULATE-] is related to [SURFACE-] because items accumulate on surfaces. See the radial category for Russian *raz-* [APART-] below.

1  
 2 The classifier *pian* ‘slice’, functions as a sortal classifier for *shuye* ‘leaf’ due to  
 3 semantic overlap (leaves are flat objects). With *qiche* ‘car’, *pian* functions as a  
 4 collective mensural classifier, producing the meaning ‘group of cars’. With *mutou*  
 5 ‘wood’, *pian* produces yet another kind of mensural classifier (termed “individuating”  
 6 by Zhang), which expresses a counting unit for the mass noun. With *luobo* ‘carrot’,  
 7 *pian* functions as a partitive mensural classifier. As these Russian and Chinese  
 8 examples indicate, both prefixes and numeral classifiers can be polysemous.

9 The groups of linguistic units that numeral classifiers sort often exhibit a  
 10 radial category structure with a semantic prototype and related subcategories.  
 11 Compare Figures 1 and 2, which illustrate polysemy for both classifiers and prefixes  
 12 (numbers in the figures are given for ease of reference only and meanings of the  
 13 unprefixated base verbs are given in square brackets in Figure 2). As described by  
 14 Deepadung (1997), the Thai classifier *tua*, for example, prototypically refers to (1)  
 15 quadruped animals such as buffalos and elephants. By extension, *tua* also classifies  
 16 (2) other animates, such as ghosts and (3) animate-shaped items like mannequins and  
 17 dolls. Extensions based on the presence of legs motivate the inclusion of (4) four-  
 18 legged artifacts such as tables and chairs and this gets further generalized to (5)  
 19 furniture. Similarly, (6) limbed items like shirts and trousers are also covered in this  
 20 class, and this motivates including (7) other kinds of clothing as well.

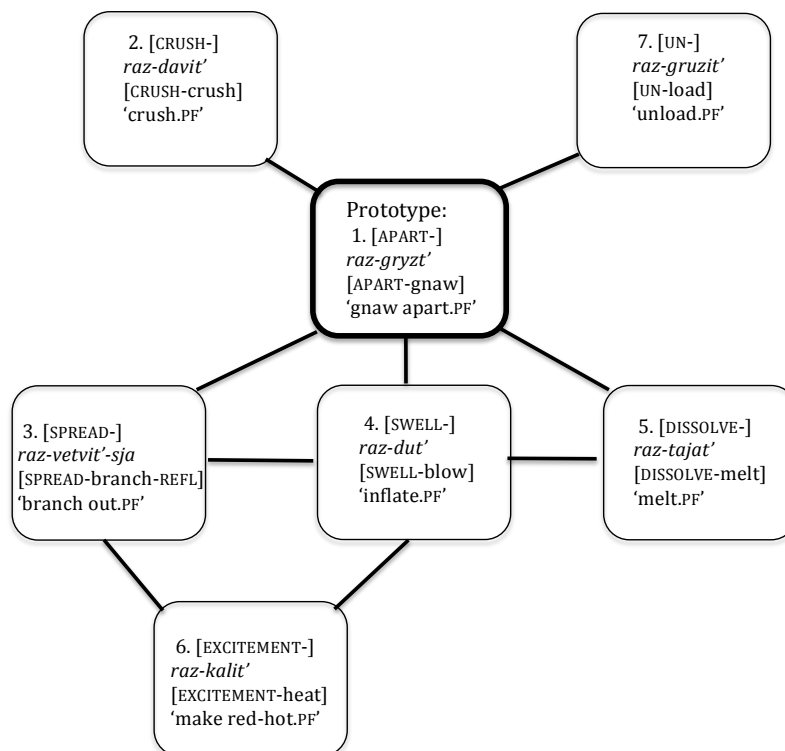
21 Slavic aspectual prefixes such as Russian *raz-* show a comparable structure.  
 22 The prototypical meaning for this prefix is (1) [APART-], as in *raz-gryzt* ‘[APART-  
 23 gnaw] ‘gnaw apart.PF’, which is formed from the verb *gryzt* ‘gnaw.IMPF’. (2)  
 24 [CRUSH-] involves the destruction of the internal structure of an item, which typically  
 25 means that the edges move apart. A cluster of meanings (3-6) focus on the dispersal  
 26 inherent in [APART-], yielding [SPREAD-], [SWELL-], and [DISSOLVE-]. Excitement  
 27 spreads and things that are excited often swell, yielding a meaning of [EXCITEMENT-]  
 28 in this cluster, as in the verb *raz-kalit* ‘[EXCITEMENT-heat] ‘make red-hot.PF’ where  
 29 heating causes both swelling and excitement. (7) [UN-] is related to the prototype in  
 30 that undoing something is a kind of taking apart.

31 Though in the cognitive linguistic approach taken here it is perhaps a default  
 32 assumption that lexical categories have some degree of radial structure, grammatical  
 33 categories also tend to be more schematic. The point made here concerning the  
 34 existence of the same kind of radial category structure in both categories thus serves  
 35 to illustrate further the parallels between numeral classifiers and Slavic verbal  
 36 prefixes as *lexico*-grammatical unitizers. Further, the radial category structure of  
 37 numeral classifiers is a problem for analyses that assume numeral classifiers are  
 38 semantically null (cf., e.g., Her and Hsieh, 2010).  
 39



1  
2  
3  
4

Figure 1: Radial Category Structure for Thai Classifier *tua* (adapted from Deepadung, 1997).



5  
6  
7  
8  
9

Figure 2: Radial Category Structure for Russian aspectual prefix *raz-* [APART-] (adapted from Janda and Nessel, 2010).

## 5.2 Construal



1 A given item can be classified in various ways, depending upon the speaker's  
 2 construal of that item. Both numeral classifier systems (cf. Kilarski 2013: 295–297)  
 3 and Slavic prefixation allow this kind of variation, which expands the lexicon.

4 The subjective nature of the selection of various prefixed forms of verbs is  
 5 well known in Slavic linguistics. For example, there are sometimes competing Natural  
 6 Perfectives for a single imperfective verb, e.g., Russian *gruzit* 'load.IMPF', which is  
 7 paired with *na-gruzit* [SURFACE-load], *po-gruzit* [RESULT-load], and *za-gruzit*  
 8 [CHANGE TO A FIXED STATE-load], all meaning 'load.PF'. Sokolova et al. (2012)  
 9 studied 1,920 examples of the Russian verb *gruzit* 'load.IMPF' and its three Natural  
 10 Perfectives culled from the Russian National Corpus. Logistic regression analysis of  
 11 this data shows that the distribution of the prefixes is non-random, with a highly  
 12 statistically significant relationship between the prefix and the grammatical  
 13 construction (theme-object, as in *load the hay onto the truck* as opposed to goal-  
 14 object, as in *load the truck with hay*). This result gives strong evidence that the  
 15 prefixes are not semantically empty. In these three Natural Perfectives the prefixes do  
 16 not alter the sense of the source notion 'load.IMPF' to express qualitatively different  
 17 situations, but express subtle differences in construal, which are indicated in (9).

- 18  
 19 (9) a. *na-gruzit* [SURFACE-load] 'load.PF'—focuses on the accumulation of the  
 20 loaded object(s), e.g., *na-gruzit sumku arbatskim porodistym tovarom*  
 21 'load.PF a bag with fine goods from the Arbat'  
 22  
 23 b. *po-gruzit* [RESULT-load] 'load.PF'—most neutral, can also be used for things  
 24 that don't ordinarily get loaded, e.g., *po-gruzit ranennyx v furgon* 'load.PF  
 25 the wounded into a van'.  
 26  
 27 c. *za-gruzit* [CHANGE TO A FIXED STATE-load] 'load.PF'—focuses on canonical  
 28 and non-canonical states resulting from loading, e.g. *za-gruzit paroxod*  
 29 *proviziej* 'load.PF a steamship with provisions'; default in professional  
 30 contexts.  
 31

32 Although sortal classifier systems are often characterized in terms of default usage  
 33 based on "objective" criteria such as shape, etc., classifier variation expressing subtle  
 34 differences in construal is attested in a number of languages. For example, Chao  
 35 (1968: 507–508) points out that Chinese *men* 'door' takes different classifiers  
 36 depending on how the object is conceptualized, as shown in (10):  
 37

- 38 (10) a. *i- shann men*  
 39 a CL:leaf-shaped-object door  
 40 'a door [as a physical object]'  
 41  
 42 b. *i- daw men*  
 43 a CL:way/course/path door  
 44 'a doorway to go through'.  
 45

46 In this case the difference in classification does not pick out materially different kinds  
 47 of objects, but focuses on different (functional) aspects of a single type of object.  
 48 Zhang (2013: 72) gives similar examples, e.g., those in (11):  
 49

- 50 (11) a. *san tiao yu*

1 three CL:long-thin fish  
2 ‘three fish [focus on body shape]’

3  
4 b. *san wei yu*  
5 three CL:tail fish  
6 ‘three fish [focus on tail]’

7  
8 Perhaps the most well known examples of subjective construal in classifier choice are  
9 Becker’s (1975: 32) Burmese examples with *myi?* ‘river’, given in (12):

- 10  
11 (12) a. *myi? tə myi?*  
12 river one CL:river  
13 ‘a river [default case]’  
14  
15 b. *myi? tə ya?*  
16 river one CL:place  
17 ‘a river as site [for a picnic, etc.]’  
18  
19 c. *myi? tə tan*  
20 river one CL:line  
21 ‘a river [on a map]’  
22  
23 d. *myi? tə hmwa*  
24 river one CL:section  
25 ‘a river section [for fishing, etc.]’<sup>18</sup>  
26  
27 e. *myi? tə ‘sin*  
28 river one CL:distant arc  
29 ‘a river as path to the sea’  
30  
31 f. *myi? tə θwe*  
32 river one CL:connection  
33 ‘a river as a connection [linking two villages, etc.]’  
34  
35 g. *myi? tə ‘pa*  
36 river one CL:sacred object  
37 ‘a river [in mythology]’  
38  
39 h. *myi? tə khu’*  
40 river one CL:conceptual unit  
41 ‘a river [in a discussion of rivers in general]’  
42

43 Such examples are important because descriptions of sortal classifier systems tend to  
44 give the impression that there is a single sortal classifier that is used whenever a given  
45 noun occurs with a numeral. But the reality, at least for some languages rich in  
46 classifiers, is that different construals of an object trigger different sortal classifiers,

---

<sup>18</sup> Note that the focus on a section of a river or a part (tail) of a fish (example 9b) is analogous to the profiling of a phase of an event. We thank an anonymous reviewer for this observation.

1 just as different construals of a situation trigger different perfectivizing prefixes in  
2 Russian and other Slavic languages.

### 4 **5.3 General Lexico-Grammatical Unitizer**

5 Lucy (1992: 76, citing Greenberg, 1972) observes that in languages with sortal  
6 classifiers “there is usually a very general classifier, somewhat neutral in its sense,  
7 which can be applied in place of any of the sortals with the possible exception of the  
8 classifiers for animate entities.” Yucatec Maya, for example, has two general sortal  
9 classifiers, *-p'éel* ‘CL:three dimensional’ and *-túul* ‘CL:animate’. It is well known that  
10 Mandarin Chinese has a general sortal classifier *ge*; according to Gao and Malt (2009:  
11 132) *ge*, which is “used for any noun that does not fall into a more specialized [sortal]  
12 classifier category, can also substitute for the more specialized classifiers [...] and  
13 often does so in casual conversation.” Recall likewise from the previous discussion  
14 that Persian has a general classifier *ta*, which is used both as a general sortal and a  
15 general mensural classifier.

16 In parallel fashion, the Slavic languages have prefixes that have been  
17 generalized to some extent as “purely perfectivizing” prefixes. There are three criteria  
18 for the generalization of a perfectivizing prefix in Slavic languages: (1) its overall  
19 level of productivity; (2) the diversity of predicate types to which it attaches; (3) its  
20 substitution for other prefixes. In Russian, *s-* [TOGETHER-] is currently the most  
21 productive prefix in the derivation of Natural Perfectives, as is evidenced by its  
22 productivity with loan verbs, cf., e.g., *s-organizovat'* [TOGETHER-organize]  
23 ‘organize.PF’, *s-komprometirovat'* [TOGETHER-compromise] ‘compromise.PF’, etc.  
24 (criterion 1). The Russian prefix *s-* also occurs with a variety of predicate types,  
25 including inchoatives, e.g., *s-kondensirovat'* [TOGETHER-condense] ‘condense.PF’,  
26 factitives, e.g., *s-blizit'* [TOGETHER-close] ‘bring together.PF’, and semelfactives, e.g.,  
27 *s-glupit'* [ONCE-act stupid] ‘do one stupid thing.PF’ (criterion 2). Finally, *s-*  
28 [TOGETHER-] shows a limited ability to replace other prefixes colloquially as a  
29 perfectivizer without changing the meaning of the verb, e.g., *s-peč'* [TOGETHER-bake]  
30 ‘bake.PF’ for *iz-peč'* [EXHAUSTIVE RESULT-bake] ‘bake.PF’ and *s-gotovit'* [TOGETHER-  
31 prepare] ‘prepare.PF’ for *pri-gotovit'* [ARRIVE-prepare] ‘prepare.PF’ (criterion 3).<sup>19</sup>

32 In Bulgarian, *iz-* [EXHAUSTIVE RESULT-] has become the most productive  
33 “purely perfectivizing” prefix, and occurs with loan verbs (in spite of the fact that  
34 loan verbs tend to resist prefixation in Bulgarian, remaining biaspectual), cf., e.g., *iz-*  
35 *korigram* [EXHAUSTIVE RESULT-correct] ‘correct.PF (colloquial)’ (criterion 1).  
36 Bulgarian *iz-* [EXHAUSTIVE RESULT-] is also quite common with a variety of predicate  
37 types, including ordinary telic verbs, e.g., *iz-pija* [EXHAUSTIVE RESULT-drink] ‘drink  
38 up.PF’, inchoatives, e.g., *iz-beleja* [EXHAUSTIVE RESULT-turn white] ‘turn white.PF’,  
39 factitives, e.g., *iz-belja* [EXHAUSTIVE RESULT-make white] ‘make white.PF’,  
40 distributives, e.g., *iz-krada* [DISTRIBUTE-steal] ‘steal all of.PF’, and semelfactives, e.g.,  
41 *iz-gruxtja* [ONCE-grunt] ‘grunt (once) .PF’ (criterion 2).

42 Perhaps the best example of a Slavic general prefix creating Natural  
43 Perfectives is *s-/z-* [RESULT-], as in Czech *z-měnit*, Slovak *z-menit'*, Polish *z-mienić*,  
44 and Slovene *s-premeniti*, all with the structure [RESULT-change] and meaning  
45 ‘change.PF’ (cf. Dickey, 2005). In these languages, this largely bleached prefix is  
46 highly productive in the creation of Natural Perfectives; this productivity includes

---

<sup>19</sup> In addition to *s-*, there is evidence that *po-* has historically played the role of a generalized perfectivizer in Russian, and that *za-* is coming to play this role in colloquial Russian (Gjervold, 2014).

1 loan verbs (criterion 1) and a diversity of predicate types (criterion 2). It also  
 2 competes with other prefixes (criterion 3; e.g., Czech *ze-mřít* [RESULT-die] ‘die.PF’  
 3 alongside *u-mřít* [MOVE AWAY-die] ‘die.PF’).  
 4

#### 5 5.4 Discourse Foregrounding

6 Slavic aspectual prefixes and numeral classifiers have similar functions in discourse  
 7 since both can effect foregrounding in narratives. Likewise, McGregor (2002: Chapter  
 8 9) shows that verb classifiers in Gooniyandi are associated with foregrounding vs.  
 9 backgrounding in that language.

10 Several studies have observed that numeral classifiers can function to mark  
 11 nouns as foreground, i.e., to mark entities as having some kind of high discourse  
 12 saliency. Sun (1988) presents a statistical study of numeral classifiers in Mandarin  
 13 Chinese narratives, and finds that nouns referring to entities that are thematically  
 14 important/central to the narratives (and are subsequently mentioned numerous times)  
 15 show a strong tendency (80%) to be introduced with a numeral classifier. In contrast,  
 16 nouns that are not thematically important/central (and are subsequently mentioned  
 17 very few times if at all) show a strong tendency (82%) to be introduced without  
 18 numeral classifiers. Sun (1988) gives no textual examples, only statistics; Li (2000:  
 19 1121–1122) gives the following example of this phenomenon:  
 20

- 21 (13) *Chuan shuo zai hen gu de shihou, you yi-ge jiao Youdu*  
 22 Legend say be very old MOD time, there-be one-CL called Youdu  
 23 *de defang zhongnian bu jian taiyang, dao chu yipian qihei.*  
 24 MOD place all year not see sun, everywhere all pitch dark  
 25 *Zai nar you yi-zuo da hei shan, shan shang zhu*  
 26 In there there-be one-CL big dark mountain mountain top live  
 27 *zhe xuduo kepa de guaishou Neixie guaishou jingchang xia*  
 28 PF many scary MOD monster. Those monsters often descend  
 29 *shan weihai renmen. You yi-ge juren jiao Kuafu, ta*  
 30 mountain endanger people there-be one-CL giant named Kuafu, he  
 31 *yong guaizhang he guaishou bodou le jiu tian jiu yie zhongyu*  
 32 use cane with monster fight PF 9 day 9 night finally  
 33 *ba ta da si le.*  
 34 BA them beat dead PF

35 ‘Once upon a time, in a [CL] **place called Youdu**, people lived in darkness all  
 36 year round. There was a [CL] **big black mountain** where many terrible beasts  
 37 lived. The beasts often went out to harm people. There was a [CL] **giant called**  
 38 **Kuafu**. He fought with the beasts with a stick for nine days and nine nights.  
 39 Finally, he killed them all...’  
 40

41 Li points out that the noun phrases introduced with numeral classifiers (boldfaced) are  
 42 all thematically important in this narrative. Evidence of this is the fact that they are  
 43 subsequently mentioned in the narrative, as well as the fact that noun phrases that  
 44 occur post-verbally, after *you* ‘there-be’ have high discourse saliency in Mandarin  
 45 Chinese (Li 2000: 1122).

46 Li (2000: 1118) also observes that in Mandarin Chinese numeral classifiers are  
 47 employed to mark noun phrases as salient for the purpose of “vivifying or intensifying  
 48 the description without [an] implication of significance in the thematic development  
 49 of the narrative.” This phenomenon can be seen in the following pair of examples in  
 50 which (14a) with a numeral classifier presents a relatively visually graphic image,  
 51 whereas (14b) presents a generic image.  
 52

1 (14) a. *Kuafu si le. Tade guanzhang dunshi bian cheng le yi-ke*  
 2 Kuafu die PF His walking stick immediately change into PF one-CL  
 3 *xianhua shenghai de da taoshu.*  
 4 flowers blooming MOD big peach tree  
 5 ‘Kuafu died. His walking stick immediately changed into a [cl] large peach  
 6 tree with blooming flowers.’  
 7

8 b. *Pangu si hou, tade zhiti bian cheng le shan.*  
 9 Pangu die after his body change into PF mountain  
 10 ‘After Pangu died, his body changed into [a Ø] mountain.’  
 11

12 In aspectology foregrounding is understood largely in terms of narrative  
 13 sequencing, which is irrelevant for nominal categories. The correlation between  
 14 perfective categories and narrative foregrounding is well known in functional  
 15 linguistics generally (cf., e.g., Hopper, 1979) as well as in Slavic linguistics, though  
 16 these are tendencies as opposed to absolute rules (cf. in this regard Chvany, 1985).  
 17 The foreground of a narrative consists of situations presented as being in  
 18 chronological sequence and causally related, i.e. the essential plot-line events, which  
 19 cannot be omitted without impairing the coherence of the narrative. A good example  
 20 of narrative foregrounding in Russian comes from Gorky’s *Mat’* (*The Mother*):  
 21

22 (15)  
 23 *Pavel byl bolen v subbotu, kogda vy-vesili*  
 24 Pavel was.IMPF ill on Saturday when hung-up.PF  
 25 *ob’javlenie direktora o sbore kopejki; on ne*  
 26 announcement director about collection kopec he not  
 27 *rabotal i ne znal ničego ob etom. Na*  
 28 worked.IMPF and not knew.IMPF nothing about that on  
 29 *drugoj den’, posle obedni, k nemu prišel blagoobraznyj*  
 30 other day after mass to him came.PF dapper  
 31 *starik, litejščik Sizov, vysokij i zloj slesar’ Maxotin*  
 32 old-man smelter Sizov tall and vicious locksmith Makhotin  
 33 *i raz-skazali emu o rešenii direktora.*  
 34 and told.PF him about decision director  
 35 ‘Pavel was.IMPF ill on the Saturday when posters [OUT OF A CONTAINER-hung]  
 36 were hung up.PF announcing the manager’s order in regard to the toll. He had  
 37 not gone to work.IMPF and he knew.IMPF nothing about it. The next day, after  
 38 mass, a dapper old man, the smelter Sizov, and the tall, vicious-looking  
 39 locksmith Makhotin, [ARRIVE-walked] came.PF to him and [SPREAD-told]  
 40 told.PF him of the manager’s decision.’<sup>20</sup>  
 41

42 The plot line of this narrative has three sequenced events: the hanging up of the  
 43 posters, the arrival of Sizov and Makhotin, and their report about the toll. All three  
 44 events are presented with perfective verbs. By contrast, background situations such as

<sup>20</sup> The Russian original comes from Goslitizdat. Moscow-Leningrad. 1951, p. 49. The English translation is from the ebook version at manybooks.net, p. 52. The remaining translations are: Polish translation by Halina Górka. Państwowe Wydawnictwo Literatary Pięknej Litewskiej SSR, 1952, p. 71; Czech translation by Vlasta Borek, Svoboda, Praha, 1951, p. 58; Slovak translation by Dr. Maria Klimová. Pravda, Bratislava, 1952, p. 66; Croatian translation published by Glas rada, Zagreb, 1950, p. 60; Bulgarian translation by Stojan Karolev, Izdatelstvo na bŕlgarskata komunističeska partija, Sofija, 1949, p. 60.

1 the fact that Pavel was sick when the first event took place and didn't work that day or  
 2 know about it, are presented with three imperfective verbs. Translations of this  
 3 narrative into other Slavic languages repeat the pattern of perfectives used to convey  
 4 the plot-line events: Polish *wy-wieszono* [OUT OF A CONTAINER-hung] 'hung-up.PF',  
 5 *przy-szedł* [ARRIVE-walked] 'came.PF', *o-powiedzieli* [AROUND-told] 'told.PF'; Slovak  
 6 *vy-vesili* [OUT OF A CONTAINER-hung] 'hung-up.PF', *pri-šiel* [ARRIVE-walked]  
 7 'came.PF', *po-rozprávali* [RESULT-told] 'told.PF'; Croatian *is-takli* [OUT OF A  
 8 CONTAINER-hung] 'hung-up.PF', *do-šao* [ARRIVE-walked] 'came.PF', *iz-vijestili*  
 9 [EXHAUSTIVE RESULT-told] 'told.PF'; Bulgarian *raz-lepixa* [SPREAD-hung] 'hung-  
 10 up.PF', *do-jdoha* [ARRIVE-walked] 'came.PF', *raz-pravixa* [SPREAD-told] 'told.PF'.  
 11 However, there are sometimes deviations from this pattern on the western edge of  
 12 Slavic territory (cf. Dickey, 2011 where this phenomenon is amply documented), as  
 13 we see in the Czech translation of the same passage, where the last verb in the  
 14 sequence is an imperfective: *vy-věšena* [OUT OF A CONTAINER-hung] 'hung-up.PF', *při-  
 15 šel* [ARRIVE-walked] 'came.PF', *vy-prav-ovali* [OUT OF A CONTAINER-told-IMPF]  
 16 'told.IMPF'.

17 Systemically the correlation is between foregrounding and perfective verbs,  
 18 and in Slavic generally prefixation is the predominant marker of perfectivity, since  
 19 simplex perfectives are very few in number.

20 Given the attestations of numeral classifiers functioning to indicate high  
 21 discourse saliency in Mandarin Chinese and Malay, there seems to be a clear parallel  
 22 with the foregrounding functions of perfective verbs in Slavic. The narrative  
 23 foregrounding of Slavic perfective verbs signals important events, whereas the  
 24 foregrounding of numeral classifiers signals thematically important entities or creates  
 25 vivid descriptions. This difference is simply a consequence of the referential domains  
 26 of verbs and nouns: events in time versus entities in space.

## 27 28 **5.5 Definiteness Effects**

29 The issue of definiteness effects of numeral classifiers and perfective aspect in some  
 30 Slavic languages (primarily Russian) remains controversial. However, as many  
 31 classifier languages (e.g., Chinese) and most Slavic languages have no definite  
 32 articles that function directly to express definiteness, it should not come as a surprise  
 33 that various definiteness effects have developed in these categories in the respective  
 34 languages. Li and Bisang (2012) point out different mechanisms for expressing  
 35 definiteness and indefiniteness in various languages, including numeral classifiers in  
 36 Sinitic languages and the association of nominal definiteness and indefiniteness with  
 37 perfective and imperfective aspect (respectively). However, here the definiteness  
 38 effects of the perfective aspect are considered with respect to reference to events, and  
 39 not the definiteness of their direct objects. As the definiteness effects in question are  
 40 uneven across languages and also weakly grammaticalized in most languages where  
 41 they exist, we refer here to **weak definiteness effects** for both numeral classifiers and  
 42 perfective verbs.

43 One of the four functions of numeral classifiers enumerated by Bisang (1999)  
 44 is that of discourse functions, i.e., referential functions. The expression of definite  
 45 reference by numeral classifiers occurs to varying degrees in different languages in  
 46 so-called **bare classifier constructions**, i.e., constructions lacking numerals. As  
 47 argued by Simpson et al. (2011) and Li and Bisang (2012), the referential functions of  
 48 numeral classifiers are a secondary development from their primary function of  
 49 individualization.

1 Definite reference by means of bare classifier constructions is far from  
 2 consistent across numeral classifier languages of East and Southeast Asia. In dialects  
 3 of Chinese, there seems to be a north-south continuum of bare classifier constructions  
 4 occurring with definite reference: they do not occur in Mandarin in either pre- or post-  
 5 verbal position; in Wu they occur in preverbal position, and in Cantonese they occur  
 6 not only in pre- but also post-verbal position. However, it does not appear that bare  
 7 classifier constructions are definiteness markers in any dialect of Chinese on a scale  
 8 approaching that of articles in languages such as English (Li and Bisang, 2012; Zhang  
 9 2013: 144–146). It is interesting to note that in Cantonese, the variety of Chinese in  
 10 which the bare classifier construction most often has a definite value, bare classifier  
 11 constructions are nevertheless split between definite and non-specific indefinite  
 12 readings, as the specific indefinite reading is expressed by *yi* ‘one’ + CL + N (the same  
 13 construction is also required for a specific-indefinite reading in Mandarin, cf. Li and  
 14 Bisang 2012: 344 and the references cited there). However, Erbaugh (2002: 46) gives  
 15 an example of a Cantonese bare classifier construction with specific-indefinite  
 16 reference, so the situation is not quite clear.

17 In some Southeast Asian languages, bare classifier constructions do appear to  
 18 express definiteness. Li and Bisang (2012: 353) point out that in Hmong the classifier  
 19 *tus* expresses definiteness, as in the following example (from Mottin 1980: 200).

- 20  
 21 (16) *Thaum ub muaj ob tug niam txiv. Tus txiv tuag lawm. Tus*  
 22 Long.ago there.are two CL wife husband CL husband die PF CL  
 23 *niam quaj quaj nrhiav nrhiav tsis tau tus txiv.*  
 24 wife cry cry look.for look.for NEG get CL husband  
 25 ‘Long ago there was a wife and a husband. **The [cl] husband** died. **The [cl]**  
 26 **wife** kept crying but no matter how much she looked, she couldn’t find **her [cl]**  
 27 **husband.**’

28  
 29 Bisang (1999: 152–153), however, suggests that the referential function of  
 30 classifiers in Hmong is in general secondary, but that a contrast in referentiality seems  
 31 to be the primary function of different forms of numeral classifiers in the Miao  
 32 language of Meining (the details are complex, cf. Bisang 1999: 153–155). An  
 33 example is given in (17).

- 34  
 35 (17) *t‘au<sup>33</sup> i<sup>55</sup> m‘a<sup>35</sup> i<sup>55</sup> dae<sup>35</sup> a<sup>33</sup>dy<sup>33</sup> d‘æy<sup>31</sup> d‘a<sup>35</sup>. tae<sup>33</sup> a<sup>33</sup>dy<sup>33</sup>*  
 36 time that there.is one CL:INDEF fox exit come CL:DEF fox  
 37 *ŋi<sup>55</sup> la<sup>11</sup> ae<sup>55</sup> ts‘ae<sup>53</sup> dau<sup>11</sup>, i<sup>55</sup>vie<sup>33</sup> n‘i<sup>13</sup> t‘ie<sup>55</sup> hi<sup>33</sup> tau<sup>33</sup> qu<sup>55</sup>*  
 38 this also very hungry PF but he look.for not get food  
 39 *qa<sup>55</sup> si<sup>33</sup> n‘au<sup>35</sup>. n‘i<sup>13</sup> b‘o<sup>31</sup> ts‘ae<sup>33</sup> nG‘ae<sup>35</sup> ku<sup>11</sup> no<sup>55</sup> v‘ae<sup>31</sup> ta<sup>33</sup>*  
 40 anything eat he see CL:DEF meat REL at place CL:DEF  
 41 *li<sup>55</sup>a<sup>55</sup> la<sup>55</sup> a<sup>33</sup>ndz‘au<sup>33</sup> i<sup>55</sup>, ...*  
 42 crow CL:DEF mouth that  
 43 ‘At that time a fox came out. **The [cl] fox** became very hungry too, but he had  
 44 been unable to find anything to eat. When he saw **the [cl] piece of meat** in **the**  
 45 **[cl] crow’s mouth**, ...’

46  
 47 Simpson et al. (2011: 185–186) discuss cases in which bare classifier  
 48 constructions in Vietnamese express definiteness when there is an added context of  
 49 contrast or sentential prominence, which recalls the foregrounding effects discussed in  
 50 the previous section. An example of definiteness with contrast is given in (18).

- 51  
 52 (18) *Thu viện vừa có thêm một kế toán và một luật sư. Ngôi kế toán*

1 library just have add one accountant and one lawyer CL accountant  
 2 *rất chăm chỉ, nhưng người luật sư rất lười.*  
 3 very diligent but CL lawyer very lazy.  
 4 ‘The library has a new accountant and a new lawyer. **The [cl] accountant** is  
 5 hard-working, but **the [cl] lawyer** is quite lazy.’  
 6

7 The situation involving definite reference by Slavic perfective verbs parallels  
 8 the situation with numeral classifiers. First, the definiteness effects of perfective usage  
 9 in Slavic are uneven, in the sense that in no Slavic language does the perfective aspect  
 10 always refer to events as definite (identifiable both by the speaker and listener).<sup>21</sup>  
 11 Second, the referential functions of the perfective aspect are marginal in the western  
 12 half of Slavic (Czech, Slovak, Slovene, Bosnian/Croatian/Serbian), and increase as  
 13 one goes eastward, reaching a relative maximum in Russian (East Slavic). The  
 14 following remarks focus on Russian, the language for which it is easiest to argue for  
 15 definiteness effects of the perfective aspect.

16 Dickey (2000) following Leinonen (1982) argues that aspect in Russian  
 17 expresses an opposition between temporal definiteness and temporal indefiniteness.  
 18 According to this view, the Russian perfective signals that a situation is unique in the  
 19 fact structure of a discourse. This occurs by virtue of the fact that the perfective  
 20 asserts temporal/causal links with preceding and subsequent situations, which almost  
 21 invariably forces reference to a unique situation. (The other situations may be  
 22 contextually supplied, as in narrative sequences of events, or presupposed, in the form  
 23 of background knowledge of the speaker and listener.) Temporal indefiniteness  
 24 simply cancels the assertion of such temporal/causal links. The weak definiteness  
 25 effects of the Russian perfective discussed below, which stem from the assertion of  
 26 temporal/causal links, are based on the uniqueness of a situation in a context, and not  
 27 familiarity/identifiability to both speaker and listener.

28 An example of the temporal definiteness of the Russian perfective is its  
 29 foregrounding function, in which perfective verbs express situations that are unique  
 30 and causally related in a narrative. However, as mentioned above, temporal  
 31 definiteness is not definiteness in the ordinary sense of the term (i.e.,  
 32 identifiability/familiarity). For example, foreground events in a narrative (cf. the  
 33 example in the previous subsection on foregrounding) cannot be said to be  
 34 identifiable to both speaker and listener, and thus are not definite, though they are  
 35 prominent and thus possibly analogous to the use of articles to express the discourse  
 36 prominence of important participants in a narrative, as described by Epstein (2002).  
 37 Further, the perfective aspect does not appear to carry out an anaphoric function on a  
 38 par with that of numeral classifiers exemplified in (16–18), which makes sense given  
 39 that temporal definiteness requires uniqueness, but not identifiability/familiarity. Here  
 40 we should point out that the uniqueness expressed by the Russian perfective means  
 41 that its perfective verbs almost invariably refer to specific tokens (i.e., specific  
 42 indefinites) or definite tokens of situations.

43 There are also certain contexts in which the perfective aspect in Russian  
 44 signals shared knowledge of an event (i.e., identifiability/familiarity) in contrast to the  
 45 imperfective, which does not signal such shared knowledge. Consider the examples in  
 46 (19), taken from Israeli (1996):  
 47

---

<sup>21</sup> This standard is in fact too high, as not all uses of definite articles in article languages (e.g., for generic reference) are identifiable both by the speaker and listener.



1 (19) a. *Kto pro-čital Vojnu i mir?*  
 2 Who [THROUGH-read] read.PF war and peace  
 3 ‘Who read *War and Peace*?’

4  
 5 b. *Kto čital Vojnu i mir?*  
 6 Who read.IMPF war and peace  
 7 ‘Who has read *War and Peace*?’

8  
 9 In (19a) the perfective signals that both the speaker and listeners know about an  
 10 assignment or the existence of a similar expectation for members of the group to have  
 11 read *War and Peace*. By contrast, the imperfective question in (19b) must be used in  
 12 the absence of such a “contract” between the speaker and listeners, e.g., in a context  
 13 where someone is simply interested in whether anyone in a group of people has read  
 14 *War and Peace*, in the absence of an expectation that they should have necessarily  
 15 done so. Thus, (19b) occurs when a speaker asks purely out of (casual) interest,  
 16 without any background knowledge that the event should have occurred.

17 However, the shared information does not have to involve a prior agreement  
 18 between the speaker and listener, it can simply be that an event was/is to take place. A  
 19 future-tense example is given in (20):

20  
 21 (20) a. A: *Anton budet v Nižnem čerez 6 časov.*  
 22 Anton will.be in Nižnij through 6 hours

23 B: *Jul’k, ty ego vstrečat’ budeš’?*  
 24 Jul’ka you him meet.IMPF FUT.AUX  
 25 ‘A: Anton will be in Nižnij Novgorod in six hours.  
 26 ‘B: Jul’ka, will you meet him?’

27  
 28 b. A: *Anton budet v Nižnem čerez 6 časov.*  
 29 Anton will.be in Nižnij through 6 hours

30 B: *Jul’k, ty ego vstretiš’?*  
 31 Jul’ka you him meet.PF  
 32 ‘A: Anton will be in Nižnij Novgorod in six hours.  
 33 ‘B: Jul’ka, will you meet him?’

34  
 35 The imperfective question in (20a) signals that B is uncertain about A’s intentions,  
 36 whereas the perfective question in (20b) signals that A and B have spoken about it,  
 37 that A mentioned that she could go meet Anton at the station, and B is simply asking  
 38 for confirmation.

39 In such verificational questions the Russian perfective signals shared  
 40 knowledge, and is thus definite. There are cases in which the imperfective is used  
 41 when there is arguably shared knowledge about an event, but in such cases the  
 42 imperfective signals that the speaker has his/her own concerns in mind, and not the  
 43 original goals of the agent. Examples are given in (21).

44  
 45 (21) a. *Ty pro-čital moju knigu?*  
 46 you [THROUGH-read] read.PF my book  
 47 ‘Did you read my book?’

48  
 49 b. *Ty čital moju knjigu? Ty ne videl tam zapisku?*  
 50 you read.IMPF my book you not saw there note

1           ‘Did you read my book? Did you maybe see a note in it?’

2  
3 The perfective in example (21a) signals, as we have said, that there is shared  
4 knowledge about the event. Moreover, it signals that the speaker is asking about the  
5 event based on that shared knowledge, i.e., about some goal of the listener (the  
6 purpose for reading the book, e.g., to gain some information) or of the speaker (in the  
7 case of a request accepted by the listener). The perfective is thus **intersubjective**: the  
8 speaker takes into account the listener’s beliefs about the world.<sup>22</sup> In (21b), the  
9 imperfective, though referring to an action that the speaker and hearer arguably share  
10 knowledge about, is speaker-oriented. It signals that the speaker is acting with his/her  
11 own concerns in mind, which are orthogonal to the original purpose/arrangement  
12 concerning the reading of the book known to both speaker and listener: in this case  
13 the speaker’s concern is to locate his/her note. Intersubjectivity and speaker-  
14 orientation are parallel to “attention sharing” and “attention directing” in Tomasello’s  
15 (1999) terminology. Intersubjectivity versus speaker-orientation is not the same as  
16 definite versus indefinite reference, but very often the intersubjectivity of the  
17 perfective correlates with definite reference.

18           To conclude, both numeral classifiers and Slavic verbal prefixes exhibit weak  
19 definiteness effects to varying degrees in different languages. Such definiteness  
20 effects are weak and uneven in both categories because they are at their origin  
21 lexically-based unitizers, in contrast to definite articles in European languages, which  
22 have generally developed from demonstrative pronouns, and are primarily  
23 grammatical function words that perform referential functions. The weak definiteness  
24 effects of numeral classifiers and Slavic verbal prefixes may be linked in some way to  
25 the function of foregrounding discussed in section 5.4.

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## 27 **5.6 Transnumerality**

28 As pointed out in section 2, Numeral classifier languages tend to lack obligatory  
29 plural inflection, and this fact has been explained broadly in terms of the  
30 **transnumerality** of nouns in numeral-classifier languages (cf. Bisang 1999: 114,  
31 citing Greenberg, 1972). Similarly, Zhang (2013) considers all nouns in Mandarin  
32 Chinese to be non-count nouns. For example, in the following Mandarin example ((1),  
33 repeated as (22) here) the noun *shu* ‘book’ can only be translated as ‘one or more  
34 books’.

35

36 (22) *Zuotian wo mai le shu.*  
37 Yesterday I buy PF book  
38 ‘Yesterday, I bought one or more books.’

39

40 The basic transnumerality of bare nouns in numeral classifier languages can be seen  
41 as a feature common to Slavic verbal roots, inasmuch as verbs themselves do not  
42 inflect for the number of events, for the reasons given in section 2.1: events tend not  
43 to coexist in large numbers due to their temporal instability. Thus, we suggest that it is  
44 the default transnumerality both of nouns in numeral-classifier languages and of  
45 verbal roots in Slavic that motivates the category of lexico-grammatical unitizers in  
46 each type of language.

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<sup>22</sup> Intersubjectivity is also important for nominal definiteness, as argued by Carlier and De Mulder 2010. A discussion of the referential functions of numeral classifiers with respect to intersubjectivity lies beyond the scope of this paper.

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## 6. Conclusion

We argue that two seemingly disjunctive categories, verbal prefixes in Slavic languages and numeral classifiers in East Asian, Southeast Asian and other languages, are conspecific. They are lexico-grammatical unitizers, whose domains are the verbal and nominal lexicons, respectively.

This proposal facilitates a unified account whereby all types of perfectivizing prefixes in Slavic find parallels in numeral classifiers. When used in telic perfectives, prefixes parallel sortal classifiers, exhibiting a range of semantic overlap between classified and classifier. Where overlap is greatest, we find Slavic Natural Perfectives that are analogous to default numeral classifiers that are most typical for given nouns. Where there is less or no overlap, we find Slavic Specialized Perfectives that create new lexical verbs, analogous to numeral classifiers that provide alternative construals for a noun. When used in atelic perfectives, prefixes parallel mensural classifiers, and both prefixes and classifiers create units that are not inherent to the base. Slavic atelic perfectives place temporal boundaries on a situation (Complex Act Perfectives) or pluck out a single cycle of a repeatable series (Single Act Perfectives) and are most prominent in the easternmost portion of Slavic territory, primarily Russian and Bulgarian.

In addition to arguments previously presented in favor of a verb classifier hypothesis for Russian Natural Perfectives (Janda, 2012; Janda et al., 2013), we adduce six further types of evidence for our broader hypothesis concerning Slavic perfectives, summarized in Table 10.

Both numeral classifiers and Slavic verbal prefixes are frequently polysemous, exhibiting a radial category structure.

Both the choice of a prefixed verb in Slavic and the choice of a numeral classifier can be more complex than simply choosing the default natural unit; instead the choice of each can reflect subtle construal of the event/entity in question. That is to say, the choice of a prefix in Slavic and of a numeral classifier is often ultimately subjective, as opposed to being based on objective properties.

In many classifier languages there are bleached general classifiers that can take the place of other classifiers (especially in colloquial language), and similarly in Slavic languages there are various prefixes which have attained high productivity, sometimes undergoing bleaching and in some cases even replacing other prefixes in colloquial registers.

Numeral classifiers in some classifier languages (e.g., Hmong and the Miao language of Meining) and verbal prefixes in some Slavic languages (primarily Russian), by virtue of their basic unitizing function, exhibit two basic (and probably interrelated) parallel discourse effects: the expression of high discourse prominence (foregrounding) and weak definiteness effects.

Finally, we witness transnumerality with respect to both the nouns of numeral classifier languages that tend to lack plural inflection, and the base verbs of Slavic languages that refer to activities in general without inflection for number of objects or events.

To conclude, in this article we argue that Slavic verbal prefixes show a number of commonalities with numeral classifier languages such as Chinese, Hmong and Yucatec Maya, and that verbal prefixes are usefully considered to be verb classifiers, i.e., verbal analogues to numeral classifiers. There are also numerous precedents for such an idea in the oft-mentioned parallels between lexical aspect and the count-mass distinction or tense and deictic nominal categories. We suggest that,

1 based on the parallels we have enumerated, Slavic verbal prefixes and numeral  
 2 classifiers should be considered to be verbal and nominal instantiations of a category  
 3 of lexico-grammatical unitizers.

4 Given the well known parallels between the referents of nouns and verbs  
 5 regarding boundedness, heterogeneity and homogeneity, the existence of a verbal  
 6 category in some languages that individuates in a manner similar to numeral  
 7 classifiers should come as no great surprise. However, as Dahl (1985: 85) points out,  
 8 the derivational aspect systems of Slavic languages are unusual, and so it should also  
 9 not be surprising that such systems are relatively rare. In this respect, our analysis  
 10 confirms the need for greater attention to verbal classification as a grammatical  
 11 concept as pointed out by McGregor (2002). Beyond this, given the parallels we have  
 12 demonstrated in referential functions between Slavic verbal prefixes and numeral  
 13 classifiers, e.g., foregrounding and weak definiteness effects, there is a need for more  
 14 investigation of the referential functions of lexico-grammatical unitizers (and other  
 15 lexico-grammatical phenomena), in terms of foregrounding, type versus token  
 16 distinctions, and weak definiteness effects. Further, this analysis shows that linguists  
 17 should be watchful for categories that are conspecific to nouns and verbs in perhaps  
 18 unexpected ways.

19 There are also particular issues to be considered, such as the weak correlation  
 20 between perfective verbs and nominal definiteness in objects on the one hand and the  
 21 ability of some numeral classifiers to bound events (cf., e.g., Wu 2004 on Mandarin  
 22 Chinese *ge* as an event classifier mentioned in section 2) on the other. However,  
 23 further comparisons must await further investigation.

24 In proposing the existence of a class of lexico-grammatical unitizers we are  
 25 well aware of the pitfalls of constructing “pre-established categories,” discussed by  
 26 Haspelmath (2007). At the same time, the commonalities are too great to be a  
 27 coincidence, and too great to be ignored. Hopefully positing such a category will  
 28 contribute to a better understanding of both Slavic verbal prefixes and numeral  
 29 classifiers, as both of these categories continue to generate debate, judging from the  
 30 unabated appearance of analyses of both.

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