Slavic aspectual prefixes and numeral classifiers: Two kinds of lexico-grammatical unitizers

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Abstract

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

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

We begin in Section 2 by reviewing some analogies between nouns and verbs, focusing on specific areas of convergence and divergence that are relevant to our argument. Section 3 presents previous work on Russian ''purely

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perfectivizing'' prefixes as the verbal analogs of sortal numeral classifiers and extends this analysis to all telic perfectives in all Slavic languages. The remaining perfectives, namely atelic perfectives found mostly in the eastern parts of the Slavic territory, are compared with mensural numeral classifiers in Section 4. The arguments in Sections 3 and 4 are buttressed by further parallels between Slavic perfectivizing prefixes and numeral classifiers in Section 5, among them the structure of the meanings of classifiers and how they can affect the construal of both objects and events, as well as the phenomenon of general classifiers, and effects of foregrounding, definiteness, and transnumerality. We sum up our findings in Section 6.

2. Analogies between nouns and verbs

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

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

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

(1)　*Zuotian　　wo　mai　le　**shu***
　　　Yesterday　I　　buy　PF　book
　　　'Yesterday, I bought one or more books.'

The basic transnumerality of bare nouns in numeral classifier languages can be seen as a feature common to Slavic verbal roots, inasmuch as verbs themselves do not inflect for the number of events, for the reasons given above: events tend not to coexist in large numbers due to their temporal instability. Thus, we suggest that it is the default transnumerality both of nouns in numeral-classifier languages and of verbal roots in Slavic that motivates the category of lexico-grammatical unitizers in each type of language.[4] All of these parallels, both those that show convergence of nouns and

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[1] 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.

[2] On these parallels cf. also Mehlig (1994) and Langacker's (1987a) descriptions of the profiles of count and mass nouns.

[3] 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.

[4] 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.

verbs and those that show divergence, are relevant to our description of Slavic perfectivizing prefixes as the verbal analogs of numeral classifiers.

2.1. Numeral classifiers and verb classifiers as lexico-grammatical unitizers

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

In 2002, McGregor suggested that there is no reason that classification should be restricted to noun systems in languages. McGregor proposed that verbs can also have classifier systems in which the verbal lexicon of a language is treated in a parallel fashion. Like numeral classifier systems, verb classifier systems have an association with quantification realized as aspectual distinctions (McGregor, 2002:287), and there is also a parallel between the typical classification according to shape in numeral classifier systems and the function of the ''shape'' of the trajectory of an event (''vectorial configuration'' McGregor, 2002:29). Although McGregor's work is based on various Australian languages (Gooniyandi, Wagiman, and the Jaminjungan languages), he makes comparisons to other languages including Mandarin Chinese, Cantonese and Hindi–Urdu, and speculates that verb classification ''is not confined to the relatively few languages in which it has been hitherto described, though the extent of its distribution across the world's languages remains to be charted'' (McGregor, 2002:404). Both Majsak (2005:339–345) and Plungjan (2011:413–416) have mentioned in passing that verb classification is observed in Slavic languages, but they have not explored this hypothesis in any detail.[6]

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

We draw a comparison between Slavic verbal prefixes and numeral classifiers instead of simply comparing the former to other systems of verb classifiers, such as the Australian verb classifying systems described by McGregor (2002) or the East and Southeast Asian verb classifiers described by Chao (1968), Matthews and Leung (2004), and Paris (2013), among others. There are three reasons for this. First, the systems of verb classifiers described by McGregor involve a broader range of modifications of verbal meaning (vectorial configurations, Aktionsart, and valence) that may or may not

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[5] 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.''

[6] 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).

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

[8] 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-čitať*, 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.

entail perfectivizing (individualizing) effects on a par with Slavic prefixes. Second, we believe that Slavic aspectual prefixation in fact represents a paradigm case of the individualizing/referential effects of classification in the verbal domain, effects that have ordinarily been discussed with reference to numeral classifiers (cf. Bisang, 1999). Third, we believe that the parallels we discuss are relevant for the larger issue of the referential parallels between nouns and verbs mentioned in Section 2 (cf., e.g., Langacker, 1987a,b; Krifka, 1989).

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

(2) a. *kan   san   bian*
         read three CL:once through
         'read three times'

     b. *kan   yi   kan*
         read one CL:read
         'read a little'

     c. *da   liang bazhang*
         hit two   CL:palm
         'slap twice'

     d. *da   yi   qiang*
         hit one CL:[shot of a] gun
         'shoot once'

Such verbal classification apparently only occurs when there is some modification of a predicate in terms of quantity (either delimitativity, as in [2b], or a plurality of events [2a,c,d]), which occurs less commonly than with nouns, because situations in time are not ordinarily counted (see below). Further, it is unclear to what extent verbal classification is a phenomenon distinct from numeral classification in Cantonese and Thai, as in these languages some classifiers function both as numeral and verbal classifiers (cf. Matthews and Leung, 2004). The same phenomenon seems to exist in Mandarin, according to Liu (2014:69).

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

There is one potential argument against viewing Slavic verbal prefixes as analogs of numeral classifiers: the fact that numeral classifiers prototypically occur with numerals, whereas Slavic verb classifiers do not. We offer two counter-arguments. First, numeral classifiers in many languages occur in bare classifier constructions, i.e., constructions without a numeral (CL + N; for examples, see Sections 5.4 and 5.5), so it is not true that numeral classifiers always occur with numerals. Second, the fact that numeral classifiers most often occur with numerals whereas Slavic verbal prefixes do not is a consequence of the differences between nouns and verbs: due to their temporal stability, numerous objects of a given type can easily exist simultaneously, whereas events, due to their instability in time, tend not to coexist in large numbers, and if they do are perceived collectively (cf. Langacker, 2008:150,151). Quantification is equally relevant for nouns and verbs, but takes very different shapes due to the ontological differences between objects and events.

3. Sortal classifiers

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

Table 1
Lexico-grammatical unitizers for nouns vs. verbs.

	Nouns	Verbs
Unitizer type	Numeral classifiers	Aspectual prefixes
Quantification	Associated with numerals	Associated with perfective aspect
Spatial profile	BOUNDED/SHAPED REGION IN SPACE	TRAJECTOR–LANDMARK RELATION
Etymological source	Stem from nouns	Stem from prepositions/pre-words

3.1. Russian Natural Perfectives

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

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, 2004), is that the profile of unbounded situations expressed by a Russian simplex imperfective verb is a verbal analog 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 analog 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, 1976; Čertkova, 1996; Forsyth, 1970; Mironova, 2004; Šaxmatov, 1952; Švedova et al., 1980; Tixonov, 1964, 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, syntactic, and derivational behavior of the prefixes found in Natural Perfectives in Russian.[9]

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

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

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

The statistical studies take the status of the ''purely perfectivizing'' prefixes in Russian beyond the realm of polemical debate by presenting extensive corpus data to make a compelling case that these prefixes are not semantically empty formal markers as previously assumed. In addition to rejecting the traditional account, we are offered a replacement, namely that the prefixes function as verb classifiers. Parallel to numeral classifiers, prefixes in Russian Natural Perfectives sort imperfective base verbs into semantic groups according to trajectory, the verbal analog of shape, and fulfill the criteria for identifying classifiers specified by McGregor (2002:18,19). The comparison with classifiers offers a new way to interpret the role of Russian prefixes and opens up opportunities for typological comparisons.

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

3.2. Russian Specialized Perfectives and telic perfectives in Slavic

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

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

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Table 2

Examples of Natural and Specialized Perfectives for two meanings of Russian prefix *raz*-: [SWELL-] and [APART-][a]

	Meaning of *raz*-: [SWELL-]		Meaning of *raz*-: [APART-]	
	Prefixed Perfective	Imperfective Base	Prefixed Perfective	Imperfective Base
Natural Perfectives (high semantic overlap between prefix and imperfective base verb)	*raz-puxnuť* [SWELL-swell] 'swell.PF' *raz-tolsteť* [SWELL-get fat] 'get fat.PF'	*puxnuť* 'swell.IMPF' *tolsteť* 'get fat.IMPF'	*raz-gryzť* [APART-gnaw] 'gnaw.PF' *raz-biť* [APART-break] 'break.PF'	*gryzť* 'gnaw.IMPF' *biť* 'break.IMPF'
	raz-bogateť [SWELL-get rich] 'get rich.PF'	*bogateť* 'get rich.IMPF'	*raz-rezať* [APART-slice] 'slice.PF'	*rezať* 'slice.IMPF'
Specialized Perfectives (low or no semantic overlap between prefix and imperfective base verb)	*raz-duť* [SWELL-blow] 'inflate.PF'	*duť* 'blow.IMPF'	*raz-tolkať* [APART-push] 'push apart.PF'	*tolkať* 'push.IMPF'
	raz-žiť sja [SWELL-live-REFL] 'get rich.PF'	*žiť* 'live.IMPF'	*raz-metať* [APART-sweep] 'scatter.PF'	*metať* 'sweep.IMPF'

[a] Due to voicing assimilation *raz*- is spelled *ras*- before voiceless consonants in Russian.

item is created, 'swell by blowing, inflate.PF'. This function is parallel to the derivational use of nominal classifiers to create new lexical items (Kilarski, 2013:295–297). Despite the fact that Specialized Perfectives create new lexical items (thus necessitating the suffixal derivation of a new imperfective verb, here *raz-duť* >*raz-du-vať* [SWELL-blow-IMPF] 'inflate.IMPF') as opposed to creating a perfective verb that is lexically equivalent to the imperfective source verb, in both cases the prefixation performs a classifying function: in the derivation of both perfective partner verbs and new lexical verbs, prefixation in Russian gives spatio-temporal shape to the source predicate, i.e., it individuates it conceptually.

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

In this account, Russian perfectivizing and lexical prefixes classify situations via their outcomes. As pointed out in Section 3.1, the spatial configurations signaled by prefixes profile the outcome as opposed to the process itself. This is parallel to the function of sortal numeral classifiers, which classify objects by the relevant counting unit (the classifying function of Bisang, 1999). The fact that verb classification in Russian involves secondary forms (derived imperfectives) is simply a consequence of the fact that the metric domain of situations is time and not space: unlike objects, situations are not simultaneously perceivable as wholes, and a type-classification system must allow for parts of situations (processes) to be identified as components of various types of goal-oriented situations, a circumstance that does not arise with physical objects, because they are simultaneously perceivable as wholes.

Table 3
Natural and Specialized Perfectives in Slavic languages.

	Late Common Slavic	Russian	Polish	Czech	BCS	Bulgarian
Imperfective base verb	*pĭsati* 'write.IMPF'	*pisať*	*pisać*	*psát*	*pisati*	*piša*
Natural perfective	*na-pĭsati* [SURFACE-write] 'write.PF'	*na-pisať*	*na-pisać*	*na-psat*	*na-pisati*	*na-piša*
Specialized Perfectives	*vŭ-pĭsati* [INTO-write] 'insert.PF'	*v-pisať*	*w-pisać*	*ve-psat*	*u-pisati*	*v-piša*
	za-pĭsati [CHANGE TO A FIXED STATE-write] 'record.PF'	*za-pisať*	*za-pisać*	*za-psat*	*za-pisati*	*za-piša*
	podŭ-pĭsati [APPLY TO BOTTOM-write] 'sign.PF'	*pod-pisať*	*pod-pisać*	*pode-psat*	*pot-pisati*	*pod-piša*

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

For example, in the Natural Perfectives related to Late Common Slavic *na-pĭsati* [SURFACE-write] 'write.PF', the meaning of *na*-[SURFACE-] overlaps with the meaning of the base verb *pĭsati* 'write.IMPF', since writing is done on a surface. By contrast, in the Specialized Perfectives the meanings of the other prefixes do not overlap with the meaning of the base verb, and this necessitates the derivation of new imperfective verbs such as Russian *v-pis-yvať* [INTO-write-IMPF] 'insert.IMPF' (cf. Polish *w-pis-ywać*, Czech *v-pis-ovat*, BCS *u-pis-ivati*, Bulgarian *v-pis-vam*[10]) creating a new aspectual pair. However, the prefixation performs a classifying function in both cases, giving the predicate in each a specific spatio-temporal shape, classifying by outcome.

The function of prefixes in the derivation not only of Natural Perfectives but also of Specialized Perfectives in Slavic is that of verb classifiers, following the parallels with numeral classifiers established by Janda et al. (2013). The different effects of prefixation (forming Natural vs. Specialized Perfectives) can be accommodated in the overall hypothesis that lexical and ''purely perfectivizing'' prefixes are verb classifiers. Note that Janda et al. (2013) document a tendency even for Natural Perfectives in Russian to derive suffixed imperfective correlates (*contra* the standard descriptions of aspectual derivation). Thus, the formal distinctions are also blurred between the two types, which is further evidence for a unified analysis of the lexico-grammatical function of ''purely perfectivizing'' and specialized prefixation.

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

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[10] 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.

Table 4
The numeral classifier construction in Mandarin Chinese.

Classifier type	Numeral	Classifier	Noun
Sortal	*yi*	*tiao*	*shengzi*
	one	CL: long-thin	rope
Mensural	*yi*	*bei*	*pijiu*
	one	CL: glass	beer

4. Mensural classifiers

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

4.1. Sortal vs. mensural classifiers

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

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

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

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

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[11] 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'.

(3)　a.　*san　pian　　shuye*　(individual/sortal classifier)
　　　　　three　CL:slice　leaf
　　　　　'three leaves'

　　　b.　*yi　pian　　qiche*　(collective/mensural classifier)
　　　　　one　CL:slice　car
　　　　　'one group of cars'

　　　c.　*san　pian　　mutou*　(individuating/mensural classifier)
　　　　　three　CL:slice　wood
　　　　　'three pieces of wood'

　　　d.　*shi　pian　　luobo*　(partitive/mensural classifier)
　　　　　ten　CL:slice　carrot
　　　　　'ten slices of carrot'

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

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

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

　　　Further, the idea that mensural classifiers are structurally distinct from sortal classifiers because they do not sort nouns according to semantic types runs into problems when one recalls that the general sortal classifier *ge* does not sort count nouns into a semantic type, but simply signals that the inherent unit of a given count noun is the counting unit.[12] As Zhang (2013:74) observes, ''[i]f CLs are disjunctively specified into either sortal or mensural, the status of *ge* is not clear'' and that if *ge*, the most frequently used classifier in Mandarin Chinese is problematic for a theory of classifiers, ''the theory does not seem to be convincing.''

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

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

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[12] The same argument applies to other languages with general classifiers, e.g., Yucatec Maya and Persian.

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

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

(4)   a.   *'un- túul   k'éeken*
          one CL:animate pig
          'one/a [live] pig'

       b.   *'um- p'éel   k'éeken*
          one CL:inanimate pig
          'one/a whole pig [dead or alive]'

       c.   *'um- p'íit   k'éeken*
          one CL:some pig
          'a little bit of/some pork'

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

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

4.2. Atelic perfectives in Slavic

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

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

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

(5)   a.   *yi bei   pijiu*   (Mandarin Chinese; Gao and Malt, 2009:1129)
          one CL:glass beer
          'a glass of beer'

       b.   *'um- p'íit   há'as*   (Yucatec Maya; Lucy, 1992:74)
          a   CL:little-bit/some banana
          'a little bit of/some banana'

Table 5
Lexico-grammatical unitizers for nouns vs. verbs.

	Nouns	Verbs
Unitizer type	Numeral classifiers	Aspectual prefixes
Reference to inherent boundaries	Sortal classifiers	Lexical + purely perfectivizing prefixes (Natural Perfectives and Specialized Perfectives)
Imposition of external boundaries	Mensural classifiers	Procedural prefixes, a.k.a. superlexical, Aktionsart prefixes (Complex Act Perfectives and Single Act Perfectives)

Table 6a
Semantic parallels between Mandarin Chinese numeral classifiers and perfectivizing prefixes in Russian and Bulgarian.

Type of Mandarin Chinese numeral classifier	Analogs among Russian perfectivizing prefixes	Analogs among Bulgarian perfectivizing prefixes
(1) INDIVIDUAL CLASSIFIERS (SORTAL) *yi* **zhi** *bi* 'a pen (for writing)' *yi* **ge** *juzi* 'an orange'	NATURAL: *po-* [RESULT-], *s-* [TOGETHER-], *za-* [CHANGE TO A FIXED STATE-], etc. SPECIALIZED: *do-* [REACH-], *s-* [TOGETHER-], *za-* [COVER-], etc.	NATURAL: *iz-* [EXHAUSTIVE RESULT-], *na-* [SURFACE-], *po-* [RESULT-], etc. SPECIALIZED: *do-* [REACH-], *s-* [TOGETHER-], *za-* [COVER-], etc.
(2) COLLECTIVE CLASSIFIERS (MENSURAL) *yi* **qun** *mianyang* 'a flock of sheep'	DISTRIBUTIVE: *pere-* [SERIATIM-], *po-* [DISTRIBUTE-] CUMULATIVE: *na-* [ACCUMULATE-]	DISTRIBUTIVE: *iz-* [DISTRIBUTE-] CUMULATIVE: *na-* [ACCUMULATE-]
(3) INDIVIDUATING CLASSIFIERS (Mensural) *yi* **bei** *pijiu* 'a glass of beer'	DELIMITATIVE: *po-* [SOME-] PERDURATIVE: *pro-* [DURATION-] ATTENUATIVE: *pri-* [ATTENUATE-], *pod-* [MINIMAL-] INGRESSIVE: *za-* [BEGIN-] FINITIVE: *ot-* [STOP AT THE ENDPOINT-] INTENSIVE-RESULTATIVE: *do-...-sja* [EXCESS-], *za-...-sja* [EXCESS-], etc.	DELIMITATIVE: *po-* [SOME-] INGRESSIVE: *za-* [BEGIN-] ATTENUATIVE: *po-* [ATTENUATE-], *pod-* [MINIMAL-]
(4) PARTITIVE CLASSIFIERS (MENSURAl) *shi* **pian** *luobo* 'ten slices of carrot'	SEMELFACTIVE: *s-* [ONCE-], *-nu* [-ONE TIME]	SEMELFACTIVE: *iz-* [ONCE-], *pro-* [ONCE-], *-na* [-ONE TIME]

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

(6)   a.   *po-sidet'*   (Russian)
            [SOME-sit]
            'sit for a while.PF'

      b.   *po-sedna*   (Bulgarian)
            [SOME-sit]
            'sit for a while.PF'

Here it is important to emphasize that delimitative *po-* [SOME-] is extremely productive in Russian and also quite productive in Bulgarian (for discussion, cf. Dickey, 2007 and Dickey, 2012), to the point that the great majority of atelic activity verbs derive delimitatives in *po-* [SOME-]. Due to its high productivity as a delimitative prefix, *po-* appears to be a kind of general perfectivizing prefix for atelic predicates in Russian and Bulgarian,[13] comparable to the Yucatec Maya general mensural classifier *-p'íit* 'a little, few' or the Persian general mensural (and sortal) classifier *ta*.

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

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

    The perfectives referred to in rows (2) and (3) in the table are all of the Complex Act type. Collective classifiers in row (2) refer to groups of objects, rendering a number of individuals as a mass. Similarly, distributive and cumulative perfectivizing

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[13] 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'.

Table 6b
Terms and examples illustrating parallels in Table 6a.[a]

Terms	Definitions	Russian examples
DISTRIBUTIVE	Action affecting many items one after another	*pere-probovať* [SERIATIM-try] 'try many things.PF'
		po-brosať [DISTRIBUTE-throw] 'throw many things.PF'
CUMULATIVE	Large quantity of action	*na-grešiť* [ACCUMULATE-sin] 'do a lot of sinning.PF'
DELIMITATIVE	Some action, for a while	*po-sideť* [SOME-sit] 'sit for a while.PF'
PERDURATIVE	Action through a period of time	*pro-plakať* [DURATION-cry] *(vsju noč')* 'cry all through.PF(the night)'
ATTENUATIVE	Small quantity of action	*pri-tormoziť* [ATTENUATE-brake] 'brake slightly.PF'
		pod-soxnuť [MINIMAL-get dry] 'get dry a little.PF'
INGRESSIVE	Initiation of action	*za-govoriť* [BEGIN-speak] 'begin to speak.PF'
FINITIVE	Cessation of action	*ot-služiť* [STOP AT THE ENDPOINT-serve] 'finish a tour of duty or church service.PF'
INTENSIVE-RESULTATIVE	Intensive action that leads to undesirable effects	*do-pljasať-sja* [EXCESS-dance-REFL] 'dance one's feet off.PF'
		za-rabotať-sja [EXCESS-work-REFL] 'overwork oneself.PF'
SEMELFACTIVE	Action performed just once	*s-glupiť* [ONCE-act stupid] 'do one stupid thing.PF'
		čix-nuť [sneeze-ONE TIME] 'sneeze once.PF'

[a] Meanings of the prefixes are analyzed in detail in Janda et al. (2013).

prefixes in Russian and Bulgarian generalize over either many repeated events or the accumulation of a repetitive process, rendering a mass conceived of as a single entity. We see this in examples like Russian *pere-biť* [SERIATIM-break] 'break (all the dishes, etc.).PF' and *na-kupiť* [ACCUMULATE-buy] 'buy a lot of.PF'.

Individuating classifiers in row (3) are mensural classifiers that refer to a typical unit of a mass; beer, for example, is typically portioned out by the glass. Most Russian and Bulgarian atelic processes can be likewise portioned out in typical episodic quantities by means of delimitative, perdurative, and attenuative prefixes, as in Russian *po-sideť* [SOME-sit] 'sit for a while.PF', *pro-plakať* [DURATION-cry] 'cry for a given period.PF', and *pri-tormoziť* [ATTENTUATE-brake] 'brake slightly.PF'. Additionally, Russian makes use of ingressive, finitive, and intensive-resultative prefixation, specifying only the initial or final portion of a process, as in *za-govoriť* [BEGIN-speak] 'begin to speak.PF', *ot-služiť* [STOP AT THE ENDPOINT-serve] 'finish a tour of duty or church service.PF', and *do-pljasať-sja* [EXCESS-dance-REFL] 'dance one's feet off.PF'. This further option is naturally available only to verbs because of the structure of events, which have beginnings and ends. The gap among numeral classifiers that lack corresponding semantics is expected because physical objects do not have beginnings and ends, but come as wholes—there is ordinarily little need to view only one edge of an object as a discrete entity.

Finally, the partitive classifiers in row (4) cut up masses into discrete small units, such as slices or particles. Semelfactive prefixes, which form Single Act Perfectives, perform an analogous role in Russian and Bulgarian, extracting a single subevent from a series (or potential series) of events. Here, in addition to the prefix *s-* [ONCE] for Russian, which takes for example the continuous process of *glupiť* 'act stupid.IMPF' and extracts *s-glupiť* [ONCE-act stupid] 'do one stupid thing.PF', we also include the perfectivizing suffix *-nu*, as in *čix-nuť* [sneeze-ONE TIME] 'sneeze once.PF' from *čixať* 'sneeze (continuously).IMPF'.[14]

4.3. Summary of parallels to classifiers in Slavic

Dickey (2000) proposes a geographical division among Slavic languages with regard to verbal aspect, according to which there are two aspectual types: an eastern type (consisting of Russian, Ukrainian, Belarusian and Bulgarian), a western type (consisting of Czech, Slovak, Sorbian and Slovene), and two transitional zones (Polish in the north, and Bosnian/Croatian/Serbian in the south). The languages of the western type make aspectual distinctions based on totality/boundedness; in contrast, the languages of the eastern type make aspectual distinctions based on temporal definiteness (a notion borrowed from Leinonen, 1982). Temporal definiteness refers to the construal of a situation as uniquely located in the fact structure of a discourse; this has as a practical effect the limitation of perfective verbs in the eastern languages to contexts of (*explicit* or *implicit*) sequentiality. As temporal definiteness is a more complex category than totality, perfective verbs in the eastern languages have a more restricted range of usage than do perfective verbs in the western languages. Polish and BCS occupy an intermediate zone in this continuum, showing evidence of both types of

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[14] Suffixation with reflexes of the Common Slavic nasal suffix *-nǫ-* is the only significant exception to the rule that prefixes mark perfectivity in Slavic. For a semantic analysis of semelfactive verbs, see Nesset (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).

Table 7
Classifiers in the Anamoim dialect of Warekena.

Semantics	Classifier collocating with 'one'	Classifier collocating with 'two'	Type
Human masculine	*peya*	*enaba*	Sortal
Human feminine	*peya*	*tuwanaba*	Sortal
Animals	*amiña*	*pamiñanaba*	Sortal
Fish	*peɺeyaɺu*	*eɺenaba*	Sortal
Curvilinear objects	*papuɺiaɺuni*	*enaba*	Sortal
Periods of time	*babuya*	*bunaba*	Mensural

Table 8
Classifiers in Purépecha.

Semantics	Classifier	Type of Classifier
Elongated objects/general classifier	*ichákwa*	Sortal
Flat objects	*ichúkwa*	Sortal
Round objects	*erhákwa*	Sortal

Source: Adapted from Vázquez Rojas Maldonado (2012:85–87).

distinctions. Dickey's geographical distribution, originally established on the basis of differences in the use of perfective vs. imperfective aspect in a range of different constructions (historical present, habitual sequences, nominalization) across the Slavic languages, is relevant also for the distribution of sortal-like and mensural-like verbal prefixes in Slavic. All Slavic languages have lexical prefixes (that form Natural and Specialized Perfectives) that parallel sortal numeral classifiers. In addition, the eastern languages that have a temporal definiteness distinction are productive in the formation of procedural perfectives, and those languages therefore have mensural-like verbal prefixes in addition to the sortal-like prefixes that are found in all Slavic languages.

We suggest that the east–west division in Slavic parallels patterns of numeral classification in numeral classifier languages. Although the prototypical classifier languages are rich in both sortal and mensural classifiers, there are classifier languages in which there are primarily or exclusively sortal classifiers, with few or no mensural classifiers. For example, according to Aikhenvald (1998:298,299), the Anamoim dialect of Warekena (spoken in Brazil) has a system of six classifiers based on the semantic features indicated, and of these five are sortal and only one is mensural, as shown in Table 7.

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

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

Table 9
Primarily or exclusively actualizing vs. actualizing and creative unitizers.

	Nouns	Verbs
Unitizer type	Numeral classifiers	Aspectual prefixes
Languages primarily or exclusively possessing actualizing unitizers	*Warekena (Anamoim), Purépecha* ●Sortal classifiers ●Few or no mensural classifiers (quantifiers used instead)	*Czech, Slovak, BCS, Slovene* ●Lexical and purely perfectivizing prefixation ●Minimal procedural prefixation
Languages possessing both actualizing and creative unitizers	*Chinese, Yucatec Maya* ●Sortal classifiers ●Mensural classifiers	*East Slavic, Bulgarian, Polish* ●Lexical and purely perfectivizing prefixation ●Productive procedural prefixation

Table 10
Summary of shared traits of numeral classifiers and Slavic verbal prefixes.

Sections	Numeral classifier systems	Slavic systems of verbal prefixation
5.1 Polysemous radial category structure	Documented for some numeral classifiers	Documented for many prefixes
5.2 Construal	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
5.3 General lexico-grammatical unitizer	General (bleached) numeral classifiers	Highly productive/bleached prefixes
5.4 Discourse foregrounding	Foregrounding: thematic centrality/vivid description	Narrative Foregrounding: plotline
5.5 Referentiality/definiteness effects	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
5.6 Transnumerality	Classifier languages tend to lack plural inflection for nouns	Slavic languages do not inflect verbs for number of objects/events

5. Additional evidence

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

The first two types of evidence explore distributional parallels in one-to-many and many-to-one relationships between classifiers and classifieds, in which we see that numeral classifiers and perfectivizing prefixes show similar polysemy structures and opportunities for multiple construal, respectively. A third type of distributional evidence is the parallel between general classifiers and generalized perfectivizers. The effect of numeral classifiers on the discourse status of a noun has been recognized by Aikhenvald (2000:324). Discourse functions are explored in relation to the foregrounding and definiteness effects found with numeral classifiers and Slavic prefixes. Finally, the issue of transnumerality relates to typological and ontological issues of numeral classifier and verb classifier systems. Note that all of these effects are linked to perfectivization via prefixes in Slavic languages.

5.1. Polysemous radial category structure

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

(7) a. *na-pisať (dokument)*   (Natural Perfective)
         [SURFACE-write] (document)
         'write (a document) to completion.PF'

     b. *na-exať (na stolb, na pešexoda)*   (Specialized Perfective)
         [SURFACE-drive] (on post, on pedestrian)
         'hit, drive over.PF (a post, a pedestrian)'

     c. *na-delať (ošibok)*   (cumulative Complex Act Perfective)
         [ACCUMULATE-do] (mistakes)
         'do/make a lot of.PF (mistakes)'[15]

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

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[15] 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.

(8) a.   *san   pian   shuye*   (individual/sortal classifier)
          three   CL:slice   leaf
          'three leaves'

     b.   *yi   pian   qiche*   (collective/mensural classifier)
          one   CL:slice   car
          'one group of cars'

     c.   *san   pian   mutou*   (individuating/mensural classifier)
          three   CL:slice   wood
          'three pieces of wood'

     d.   *shi   pian   luobo*   (partitive/mensural classifier)
          ten   CL:slice   carrot
          'ten slices of carrot'

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

The groups of linguistic units that numeral classifiers sort often exhibit a radial category structure with a semantic prototype and related subcategories. Compare Figs. 1 and 2, which illustrate polysemy for both classifiers and prefixes (numbers in the figures are given for ease of reference only and meanings of the unprefixed base verbs are given in square brackets in Fig. 2). As described by Deepadung (1997), the Thai classifier *tua*, for example, prototypically refers to (1) quadruped animals such as buffalos and elephants. By extension, *tua* also classifies (2) other animates, such as ghosts and (3) animate-shaped items like mannequins and dolls. Extensions based on the presence of legs motivate the inclusion of (4)
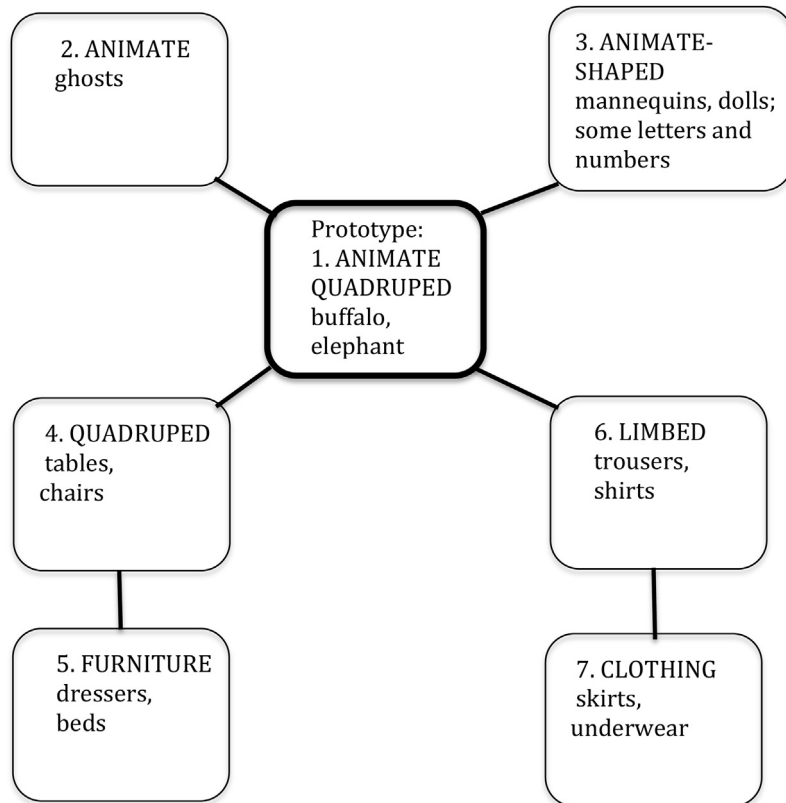

Fig. 1. Radial category structure for Thai classifier *tua*.
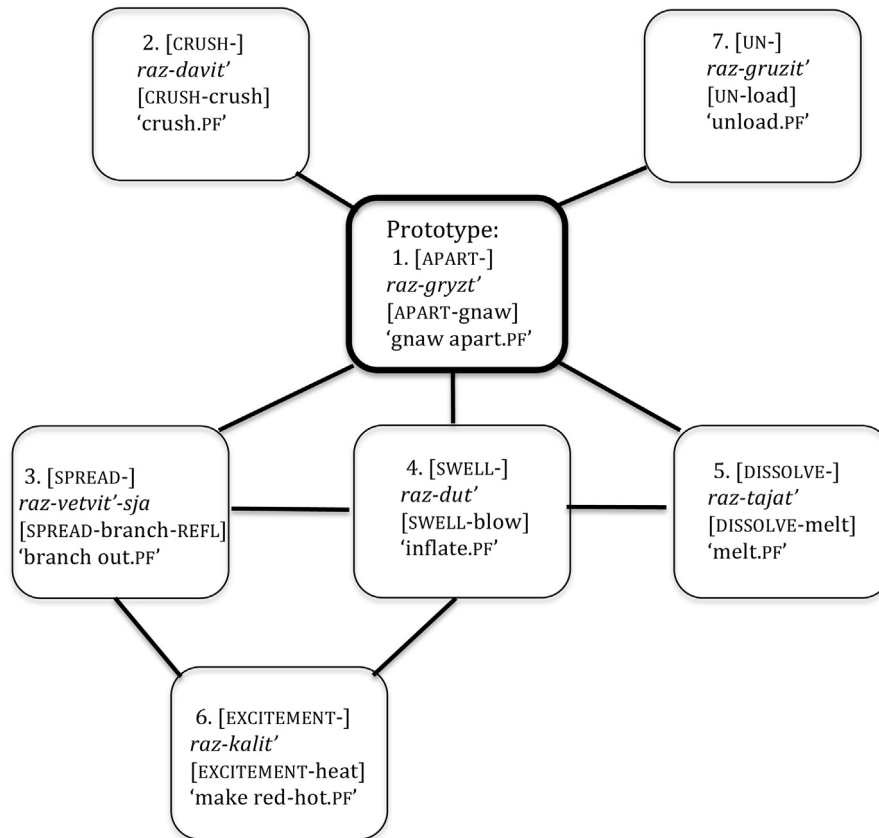*Source*: Adapted from Deepadung (1997).

Fig. 2. Radial category structure for Russian aspectual prefix *raz-* [APART-].
Source: Adapted from Janda and Nesset (2010).

four-legged artifacts such as tables and chairs and this gets further generalized to (5) furniture. Similarly, (6) limbed items like shirts and trousers are also covered in this class, and this motivates including (7) other kinds of clothing as well.

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

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

5.2. Construal

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

The subjective nature of the selection of various prefixed forms of verbs is well known in Slavic linguistics. For example, there are sometimes competing Natural Perfectives for a single imperfective verb, e.g., Russian *gruzit'* 'load.IMPF', which is paired with *na-gruzit'* [SURFACE-load], *po-gruzit'* [RESULT-load], and *za-gruzit'* [CHANGE TO A FIXED STATE-load], all meaning 'load.PF'. Sokolova et al. (2012) studied 1920 examples of the Russian verb *gruzit'* 'load.IMPF' and its three Natural

Perfectives culled from the Russian National Corpus. Logistic regression analysis of this data shows that the distribution of the prefixes is non-random, with a highly statistically significant relationship between the prefix and the grammatical construction (theme-object, as in *load the hay onto the truck* as opposed to goal-object, as in *load the truck with hay*). This result gives strong evidence that the prefixes are not semantically empty. In these three Natural Perfectives the prefixes do not alter the sense of the source notion 'load.IMPF' to express qualitatively different situations, but express subtle differences in construal, which are indicated in (9).

(9)   a.   *na-gruzit'* [SURFACE-load] 'load.PF'—focuses on the accumulation of the loaded object(s), e.g., *na-gruzit' sumku arbatskim porodistym tovarom* 'load.PF a bag with fine goods from the Arbat'

      b.   *po-gruzit'* [RESULT-load] 'load.PF'—most neutral, can also be used for things that don't ordinarily get loaded, e.g., *po-gruzit' ranennyx v furgon* 'load.PF the wounded into a van'.

      c.   *za-gruzit'* [CHANGE TO A FIXED STATE-load] 'load.PF'—focuses on canonical and non-canonical states resulting from loading, e.g. *za-gruzit' paroxod proviziej* 'load.PF a steamship with provisions'; default in professional contexts.

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

(10) a.   *yi shan   men*
           a   CL:leaf-shaped-object door
           'a door [as a physical object]'

      b.   *yi dao   men*
           a   CL:way/course/path   door
           'a doorway to go through'.

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

(11) a.   *san   tiao   yu*
           three CL:long-thin   fish
           'three fish [focus on body shape]'

      b.   *san   wei   yu*
           three CL:tail fish
           'three fish [focus on tail]'

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

(12) a.   *myi? tə   myi?*
           river one CL:river
           'a river [default case]'

      b.   *myi? tə   ya?*
           river one CL:place
           'a river as site [for a picnic, etc.]'

      c.   *myi? tə   tan*
           river one CL:line
           'a river [on a map]'

      d.   *myi? tə   hmwa*
           river one CL:section
           'a river section [for fishing, etc.]'[16]

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[16] 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.

e. *myi? tə ʻsin*
river one CL:distant arc
'a river as a path to the sea'

f. *myi? tə θwe*
river one CL:connection
'a river as a connection [linking two villages, etc.]'

g. *myi? tə ʻpa*
river one CL:sacred object
'a river [in mythology]'

h. *myi? tə khuʼ*
river one CL:conceptual unit
'a river [in a discussion of rivers in general]'

Such examples are important because descriptions of sortal classifier systems tend to give the impression that there is a single sortal classifier that is used whenever a given noun occurs with a numeral. But the reality, at least for some languages rich in classifiers, is that different construals of an object trigger different sortal classifiers, just as different construals of a situation trigger different perfectivizing prefixes in Russian and other Slavic languages.

5.3. General lexico-grammatical unitizer

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

In parallel fashion, the Slavic languages have prefixes that have been generalized to some extent as "purely perfectivizing" prefixes. There are three criteria for the generalization of a perfectivizing prefix in Slavic languages: (1) its overall level of productivity; (2) the diversity of predicate types to which it attaches; (3) its substitution for other prefixes. In Russian, *s-* [TOGETHER-] is currently the most productive prefix in the derivation of Natural Perfectives, as is evidenced by its productivity with loan verbs, cf., e.g., *s-organizovať* [TOGETHER-organize] 'organize.PF', *s-komprometirovať* [TOGETHER-compromise] 'compromise.PF', etc. (criterion 1). The Russian prefix *s-* also occurs with a variety of predicate types, including inchoatives, e.g., *s-kondensirovať* [TOGETHER-condense] 'condense.PF', factitives, e.g., *s-bliziť* [TOGETHER-close] 'bring together.PF', and semelfactives, e.g., *s-glupiť* [ONCE-act stupid] 'do one stupid thing.PF' (criterion 2). Finally, *s-* [TOGETHER-] shows a limited ability to replace other prefixes colloquially as a perfectivizer without changing the meaning of the verb, e.g., *s-peč* [TOGETHER-bake] 'bake.PF' for *iz-peč* [EXHAUSTIVE RESULT-bake] 'bake.PF' and *s-gotoviť* [TOGETHER-prepare] 'prepare.PF' for *pri-gotoviť* [ARRIVE-prepare] 'prepare.PF' (criterion 3).[17]

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

Perhaps the best example of a Slavic general prefix creating Natural Perfectives is *s-/z-* [RESULT-], as in Czech *z-měnit*, Slovak *z-meniť*, Polish *z-mienić*, and Slovene *s-premeniti*, all with the structure [RESULT-change] and meaning 'change.PF' (cf. Dickey, 2005). In these languages, this largely bleached prefix is highly productive in the creation of Natural Perfectives; this productivity includes loan verbs (criterion 1) and a diversity of predicate types (criterion 2). It also competes with other prefixes (criterion 3; e.g., Czech *ze-mřít* [RESULT-die] 'die.PF' alongside *u-mřít* [MOVE AWAY-die] 'die.PF').

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[17] 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).

5.4. Discourse foregrounding

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

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

(13) *Chuan shuo zai hen gu de shihou, you **yi-ge jiao Youdu***
      Legend say be very old MOD time, there-be one-CL called Youdu
      de defang *zhongnian bu jian taiyang, daochu yipian qihei.*
      MOD place all year not see sun, everywhere all pitch dark
      *Zai nar you **yi-zuo da hei shan,** shan shang zhu*
      In there there-be one-CL big dark mountain mountain top live
      zhe xuduo kepa de guaishou Neixie guaishou jingchang xia
      PF many scary MOD monster. Those monsters often descend
      *shan weihai renmen. You **yi-ge juren jiao Kuafu,** ta*
      mountain endanger people there-be one-CL giant named Kuafu, he
      yong guaizhang he guaishou bodou le jiu tian jiu yie zhongyu
      use cane with monster fight PF 9 day 9 night finally
      ba ta da si le.
      BA them beat dead PF
      'Once upon a time, in **a [cʟ] place called Youdu**, people lived in darkness all year round. There was **a [cʟ] big black mountain** where many terrible beasts lived. The beasts often went out to harm people. There was **a [cʟ] giant called Kuafu**. He fought with the beasts with a stick for nine days and nine nights. Finally, he killed them all. . .'

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

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

(14) a. *Kuafu si le. Tade guaizhang dunshi bian cheng le **yi-ke***
          Kuafu die PF His walking stick immediately change into PF one-CL
          xianhua shenghai de da taoshu.
          flowers blooming MOD big peach tree
          'Kuafu died. His walking stick immediately changed into **a [cl] large peach tree with blooming flowers**.'

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

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

(15)

> *Pavel* **byl**   *bolen v subbotu, kogda* **vy-vesili**
> Pavel **was.**ɪᴍᴘꜰ ill   on Saturday when **hung-up.**ᴘꜰ
> *ob''javlenie direktora o sbore kopejki; on ne*
> announcement director about collection kopeck he not
> **rabotal**   *i ne* **znal**   *ničego ob ètom. Na*
> **worked.**ɪᴍᴘꜰ and not **knew.**ɪᴍᴘꜰ nothing about that on
> *drugoj den'*, *posle obedni, k nemu* **pri-šel** *blagoobraznyj*
> other day after mass to him **came.**ᴘꜰ dapper
> *starik*, *litejščik Sizov, vysokij i zloj slesar' Maxotin*
> old-man smelter Sizov tall and vicious locksmith Makhotin
> *i* **raz-skazali** *emu o rešenii direktora.*
> and **told.**ᴘꜰ him about decision director
> 'Pavel **was.**ɪᴍᴘꜰ ill on the Saturday when posters [ᴏᴜᴛ ᴏꜰ ᴀ ᴄᴏɴᴛᴀɪɴᴇʀ-hung] **were hung up.**ᴘꜰ announcing the manager's order in regard to the toll. He **had** not **gone to work.**ɪᴍᴘꜰ and he **knew.**ɪᴍᴘꜰ nothing about it. The next day, after mass, a dapper old man, the smelter Sizov, and the tall, vicious-looking locksmith Makhotin, [ᴀʀʀɪᴠᴇ-walked] **came.**ᴘꜰ to him and [ꜱᴘʀᴇᴀᴅ-told] **told.**ᴘꜰ him of the manager's decision.'[18]

The plot line of this narrative has three sequenced events: the hanging up of the posters, the arrival of Sizov and Makhotin, and their report about the toll. All three events are presented with perfective verbs. By contrast, background situations such as the fact that Pavel was sick when the first event took place and didn't work that day or know about it, are presented with three imperfective verbs. Translations of this narrative into other Slavic languages repeat the pattern of perfectives used to convey the plot-line events: Polish *wy-wieszono* [ᴏᴜᴛ ᴏꜰ ᴀ ᴄᴏɴᴛᴀɪɴᴇʀ-hung] 'hung-up.ᴘꜰ', *przy-szedł* [ᴀʀʀɪᴠᴇ-walked] 'came.ᴘꜰ', *o-powiedzieli* [ᴀʀᴏᴜɴᴅ-told] 'told.ᴘꜰ'; Slovak *vy-vesili* [ᴏᴜᴛ ᴏꜰ ᴀ ᴄᴏɴᴛᴀɪɴᴇʀ-hung] 'hung-up.ᴘꜰ', *pri-šiel* [ᴀʀʀɪᴠᴇ-walked] 'came.ᴘꜰ', *po-rozprávali* [ʀᴇꜱᴜʟᴛ-told] 'told.ᴘꜰ'; Croatian *is-takli* [ᴏᴜᴛ ᴏꜰ ᴀ ᴄᴏɴᴛᴀɪɴᴇʀ-hung] 'hung-up.ᴘꜰ', *do-šao* [ᴀʀʀɪᴠᴇ-walked] 'came.ᴘꜰ', *iz-vijestili* [ᴇxʜᴀᴜꜱᴛɪᴠᴇ ʀᴇꜱᴜʟᴛ-told] 'told.ᴘꜰ'; Bulgarian *raz-lepixa* [ꜱᴘʀᴇᴀᴅ-hung] 'hung-up.ᴘꜰ', *do-jdoxa* [ᴀʀʀɪᴠᴇ-walked] 'came.ᴘꜰ', *raz-pravixa* [ꜱᴘʀᴇᴀᴅ-told] 'told.ᴘꜰ'. However, there are sometimes deviations from this pattern on the western edge of Slavic territory (cf. Dickey, 2011 where this phenomenon is amply documented), as we see in the Czech translation of the same passage, where the last verb in the sequence is an imperfective: *vy-věšena* [ᴏᴜᴛ ᴏꜰ ᴀ ᴄᴏɴᴛᴀɪɴᴇʀ-hung] 'hung-up.ᴘꜰ', *při-šel* [ᴀʀʀɪᴠᴇ-walked] 'came.ᴘꜰ', *vy-prav-ovali* [ᴏᴜᴛ ᴏꜰ ᴀ ᴄᴏɴᴛᴀɪɴᴇʀ-told-ɪᴍᴘꜰ] 'told.ɪᴍᴘꜰ'.

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

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

5.5. Definiteness effects

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

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[18] 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 Górska. Państwowe Wydawnictwo Literatury 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 bâlgarskata komunističeska partija, Sofija, 1949, p. 60.

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

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

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

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

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

(17)   *t'au³³ i⁵⁵   m'a³⁵ i⁵⁵ dae³⁵   a³³dy³³ d'œy³¹ d'a³⁵.   **tae³³ a³³dy³³**
         time   that there.is one CL:INDEF fox   exit   come CL:DEF fox
         ŋi⁵⁵ la¹¹   ae⁵⁵ ts'ae⁵³ daɯ¹¹, i⁵⁵vie³³ ɲ'i¹³ t'ie⁵⁵   hi³³ tau³³ qɯ⁵⁵
         this also very hungry PF   but   he   look.for not get food
         qa⁵⁵ˌsi³³ n'au³⁵. ɲ'i¹³ b'o³¹ **ts'ae³³** nɢ'ae³⁵ ku¹¹ ɲo⁵⁵ v'ae³¹ **ta³³**
         anything eat   he   see CL:DEF   meat   REL at place CL:DEF
         li⁵⁵a⁵⁵ la⁵⁵   a³³ndʑ'au³³ i⁵⁵,…
         crow   CL:DEF mouth   that
         'At that time a fox came out. **The [cl] fox** became very hungry too, but he had been unable to find anything to eat.
         When he saw **the [cl] piece of meat** in **the [cl] crow's mouth**,…'

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

(18)   *Thư viện vừa có   thêm **một kế toán**   và **một luật sư**. **Ngời kế toán**
         library   just have add one accountant and one lawyer CL   accountant
         rãt   chăm chỉ, nhưng **ngời luật sư** rãt   lười.
         very diligent but   CL   lawyer   very lazy.
         'The library has a new accountant and a new lawyer. **The [cl] accountant** is hard-working, but **the [cl] lawyer** is
         quite lazy.'

The situation involving definite reference by Slavic perfective verbs parallels the situation with numeral classifiers. First, the definiteness effects of perfective usage in Slavic are uneven, in the sense that in no Slavic language does the

perfective aspect always refer to events as definite (identifiable both by the speaker and listener).[19] Second, the referential functions of the perfective aspect are marginal in the western half of Slavic (Czech, Slovak, Slovene, Bosnian/Croatian/Serbian), and increase as one goes eastward, reaching a relative maximum in Russian (East Slavic). The following remarks focus on Russian, the language for which it is easiest to argue for definiteness effects of the perfective aspect.

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

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

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

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

       b.   *Kto*   ***čital***   *Vojnu*   *i*   *mir?*
            Who   read.IMPF   war   and   peace
            'Who has read *War and Peace*?'

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

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

(20)   a.   A: *Anton*   *budet*   *v*   *Nižnem*   *čerez*   *6*   *časov.*
                 Anton   will.be   in   Nižnij   through   6   hours
         B: *Juľk,*   *ty*   *ego*   ***vstrečať***   ***budeš***'?
                 Jul'ka   you   him   meet.IMPF   FUT.AUX
         'A: Anton will be in Nižnij Novgorod in six hours.
         'B: Jul'ka, will you meet him?'

---

[19] 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.

b.	A:	*Anton budet v Nižnem čerez 6 časov.*
		Anton will.be in Nižnij through 6 hours
	B:	*Jul'k, ty ego **vstretiš**'?*
		Jul'ka you him meet.PF
	'A:	Anton will be in Nižnij Novgorod in six hours.
	'B:	Jul'ka, will you meet him?'

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

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

(21)	a.	*Ty **pro-čital** moju knigu?*
		you [THROUGH-read] read.PF my book
		'Did you read my book?'

	b.	*Ty **čital** moju knjigu? Ty ne videl tam zapisku?*
		you read.IMPF my book you not saw there note
		'Did you read my book? Did you maybe see a note in it?'

The perfective in example (21a) signals, as we have said, that there is shared knowledge about the event. Moreover, it signals that the speaker is asking about the event based on that shared knowledge, i.e., about some goal of the listener (the purpose for reading the book, e.g., to gain some information) or of the speaker (in the case of a request accepted by the listener). The perfective is thus **intersubjective**: the speaker takes into account the listener's beliefs about the world.[20] In (21b), the imperfective, though referring to an action that the speaker and hearer arguably share knowledge about, is speaker-oriented. It signals that the speaker is acting with his/her own concerns in mind, which are orthogonal to the original purpose/arrangement concerning the reading of the book known to both speaker and listener: in this case the speaker's concern is to locate his/her note. Intersubjectivity and speaker-orientation are parallel to "attention sharing" and "attention directing" in Tomasello's (1999) terminology. Intersubjectivity versus speaker-orientation is not the same as definite versus indefinite reference, but very often the intersubjectivity of the perfective correlates with definite reference.

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

5.6. Transnumerality

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

(22)	*Zuotian wo mai le **shu**.*
	Yesterday I buy PF book
	'Yesterday, I bought one or more books.'

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[20] 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.

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

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

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

There are also particular issues to be considered, such as the weak correlation between perfective verbs and nominal definiteness in objects on the one hand and the ability of some numeral classifiers to bound events (cf., Matthews and

Leung, 2004 on the use of numeral classifiers as verbal classifiers in Cantonese and Thai) on the other. However, further comparisons must await further investigation.

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

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