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Article - Version of Record

Suggested Citation:
Filip, H. (2025). The Relation of Slavic Verb Prefixes to Perfective Aspect. Languages, 11(1), Article 5.
https://doi.org/10.3390/languages11010005

languages

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# The Relation of Slavic Verb Prefixes to Perfective Aspect

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**Abstract**

This paper advances two main theses: The first overarching thesis is that the Slavic perfective/imperfective distinction is predominantly of a lexical-derivational nature. Among the categories of the tense–modality–aspect (TMA) system, Slavic aspect systems represent marginal categories, rather than core ones, which are realized by means of inflectional morphology. The second, and related, thesis concerns the status of Slavic verb prefixes in Slavic aspect systems, given that prefixed verbs constitute the bulk of their perfective verbs. I will provide some arguments, also defended elsewhere, that Slavic verb prefixes are not perfective markers, e.g., do not spell out a functional head/feature in the dedicated aspect structure, as is often assumed in syntactic theories of aspect, and neither do they carry a uniform semantic function for the interpretation of perfective aspect. Instead, Slavic verb prefixes are best treated as separate from perfectivity, on both formal and semantic grounds. This separation, however, does not mean that the two are unrelated. Here, the semantics of perfectivity is represented by means of the maximalization operator ($MAX_e$). The most fundamental requirement for its application, and for any maximalization operator for that matter, is that it respect some ordering criterion. It is the role of Slavic verb prefixes to contribute to its specification. They do so by virtue of having common uses/meanings that can be analyzed as extensive or intensive measure functions or vague quantifiers over arguments of verbs to which they are attached. Such meanings are reducible to a uniform scalar-based representation, from which the requisite ordering criterion can be extracted.

**Keywords:** Slavic aspect; verb prefixes; perfectivity; maximalization; measure functions; quantification; scales

## 1. Introduction: The Lexical-Derivational Nature of Slavic Aspect Systems

Characterizations of the grammatical aspect in Slavic languages are often predicated on two broad assumptions, which may be explicitly stated, but more often than not are implicit. First, the Slavic aspect is one of the paradigm examples, if not the best, of grammatical aspect in natural languages. All the other aspect systems are inferior examples. Hence, in order to understand what grammatical aspect in natural languages is about, we advise studying the Slavic aspect first. Second, all Slavic languages essentially have the same aspect system, which, for most practical purposes, can be conveniently illustrated with the Russian aspect, also given that Russian is the most studied Slavic language with a copious body of research on its grammatical aspect.

Separately or jointly, these two assumptions, which have a long-standing history going back to the 19th century at least, still underpin many theoretical claims and research agendas on grammatical aspect in Slavic languages in contemporary linguistics. They are rightly criticized by Dahl (2006) as a 'caricature view of Slavic aspect' for two main



Academic Editors: Karolina Zuchewicz and Petr Biskup

Received: 6 August 2025
Revised: 22 November 2025
Accepted: 1 December 2025
Published: 26 December 2025

reasons. First, from the point of view of the grammatical categories of the TMA (tense–modality–aspect) system of natural languages, Slavic languages have aspect systems that belong to its periphery rather than its core system. While the core system is inflectional, the peripheral systems are either periphrastic/phraseological (e.g., the progressive/non-progressive distinction in English) or lexical-derivational, which, according to Dahl, applies to the perfective/imperfective distinction in Slavic languages; it is realized in verb systems that exhibit numerous morphophonological and lexical idiosyncrasies.

Second, it makes no sense to speak of '(the) Slavic aspect' as one unified phenomenon, but rather of 'Slavic aspect systems', given that there are substantial differences among aspect systems of particular Slavic languages. This is not to deny that Slavic aspect systems intersect in several shared signature properties, such as the periphrastic future of imperfectives, or the lack of the ongoing ('progressive') reading of present tense forms of perfective verbs, which in a number of Slavic languages have a default future time reference/meaning.

While the perfective/imperfective distinction is grammaticized in Slavic languages, it is not realized in a fully developed grammatical system in any of them, but rather it is a predominantly lexical-derivational category, according to Dahl (2006), and the same proposal was also previously made by Filip (1992, 1993, 1999) (and elsewhere). It is not realized as an inflectional (functional) system consisting of perfective and imperfective grams, where each gram would predictably mark a verb as perfective or imperfective, carrying a single aspectually relevant semantic feature, or a single well-defined set of such semantic features that would underpin its contextually determined uses.

The Slavic perfective/imperfective distinction is best viewed as a grammatical property of fully formed verb stems (see, e.g., Filip, 1993, 1999). This is compatible with the common lexicographic practice of marking Slavic verbs taken as lexical items (in their standard lexical citation form, which is a fully formed infinitive form) as perfective, imperfective or bi-aspectual in their lexical entries. This grammatical aspect feature is inherited by their corresponding finite and non-finite forms, as well as sentences headed by them. The perfective, imperfective, and bi-aspectual are organized in a lexical-derivational system, in which the relations among morphologically related verb forms obey several derivational paradigms. Each paradigm manifests substantial idiosyncracies, both on the level of morphophonology and lexical meaning. Slavic aspect systems are organized into systems of related lexical-derivational paradigms.[1] The aspectual pairs, i.e., perfective and imperfective verbs that realize the same lexeme and only differ in their grammatical aspect, constitute a subset of derivational related forms, whereby the imperfective form is derived by means of the imperfectivizing suffix from the perfective form. All Slavic languages have an imperfectivizing suffix dedicated to deriving imperfective from perfective stems, which has some inflectional characteristics, but it does not apply to all perfective stems, its application is not always predictable and it may also introduce meaning changes that go beyond imperfective aspect.

The Slavic perfective/imperfective distinction is grammatically manifested in systematic differences between the morphological patterns for the formation of imperfective, on the one hand, and perfective verb forms, on the other hand, as well as in the syntactic distribution and interpretation patterns that separate perfective forms taken as a whole class from imperfective forms as a whole class. For instance, only imperfective, but not perfective, verbs, have as part of their conjugational paradigm the periphrastic future construction, and may have a progressive interpretation, i.e., they may be used with reference to a stage of an eventuality, ongoing at a given moment of time (reference time) and a proper subpart of a larger eventuality. Only perfective, but not imperfective, present tense

https://doi.org/10.3390/languages11010005

forms have a default future time reference, albeit this is subject to additional constraints in South Slavic languages.[2]

The grammatical status of the Slavic perfective/imperfective distinction is comparable to that of the mass/count distinction among nouns in number-marking languages like English. It is commonly assumed that nouns taken as lexical items are marked as count or mass in their lexical entries; some are dual-life. The grammatical count or mass status of a noun is manifested in their different morphological properties and syntactic distribution; e.g., count nouns, but not mass nouns, have plural forms, can occur with numerals, counting phrases, quantifiers like *each, every*, and only singular count nouns, but not mass nouns, occur with the indefinite article *a*(*n*).

The main focus of this paper, and the main argument in support of the claim that Slavic aspect systems are of a lexical-derivational nature, and hence on the periphery, rather than at the core, of the TMA system of natural languages, is on the properties of Slavic verb prefixes. This is because the majority of Slavic perfective verbs are derived, and prefixation serves as the main means for this purpose. However, Slavic verb prefixes not only do not mark verbs as perfective in all their occurrences, but prefixes that form the majority of perfective verbs also introduce meaning changes that go beyond perfective aspect. They exhibit idiosyncratic formal and semantic properties that are characteristic of derivational morphology.

All of these properties of Slavic prefixes lead to arguments precluding their treatment as inflectional, grammatical markers of perfective aspect (see Filip, 1992, 1993, 1999, and elsewhere), say on par in the grammar with the past tense marker *-ed* or the plural marker *-(e)s* (*pace*, e.g., Borer, 2005). It makes no sense to speak of 'perfective prefixes', 'purely perfectivizing prefixes', or Slavic prefixes being markers of perfective aspect, and the like.

This view of Slavic verb prefixes has been slowly gaining ground among Slavicists in the past fifteen or twenty years or so. For instance, Filip's view can be found adopted in Tatevosov (2014), and related ideas are also defended in Janda (2007) and Sokolova et al. (2013), among others. However, it is by no means a generally accepted view, beyond Slavistics, in general, aspect studies.

Therefore, some of the arguments in support of this view, also already made elsewhere (see, e.g., Filip, 1992, 1993, 1996, 1999, 2000, 2005a, and references therein), will be introduced at various points in this paper. The argument that Slavic verb prefixes are primarily lexical-derivational morphemes, rather than grammatical (inflectional) markers of perfectivity, will be further developed by motivating their relation to the phonologically null maximalization operator ($\text{MAX}_e$) (Filip & Rothstein, 2005; Filip, 2008), which instantiates the semantics of perfectivity. While Slavic verb prefixes are not instantiations of the function for the interpretation of perfective aspect, they contribute to the specifications of the condition for the application of $\text{MAX}_e$, which represents the meaning of perfective forms in Slavic languages, but also in other languages that have forms that are grammatically perfective. In order to set the stage for making this argument, this paper will first provide some empirical arguments in support of the lexical-derivational nature of Slavic aspect systems, focusing on the derivation of perfective and imperfective verb forms by means of prefixes and the imperfectivizing suffix.

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## 2. Basic Morphological Facts: Slavic Aspect Systems

This section introduces, in pre-theoretical terms, the very basic morphological patterns of Slavic verb systems that pertain to grammatical aspect, while these facts are well-known to specialists in the field of Slavic aspects (and they may skip this section), they may not be familiar to all who study grammatical aspect in natural language, be it in Slavic or other languages. Given this intended wide audience, these basic facts are here introduced to serve as a setup for the rest of the paper.

Both the imperfective and perfective paradigms contain primary (underived, simplex) verbs, i.e., verbs that contain no derivational morphology, but the vast majority of primary verbs is imperfective. Consequently, the majority of perfective verbs are derivationally complex. Prefixation is the most common means for deriving perfective verbs. However, verb prefixes have properties that are incompatible with their treatment as (grammatical) perfective markers, and a part of a functional (inflectional) structure (see Filip, 1992, 1993, 1996, 1999, 2000, and elsewhere).

It is worth emphasizing that this holds true for so-called superlexical (also known as 'external', 'modifying', and 'Aktionsart') prefixes as well as for lexical prefixes (also known as 'internal', 'qualifying', and 'resultative').[3] The distinction between lexical and superlexical prefixes, despite being taken for granted by many, is dubious at best. There is no agreement on the criteria for distinguishing lexical from superlexical prefixes, and how they are applied to different uses of prefixes, and a given proposed set of 'tests' and properties never lead to reliable results in all the relevant cases (see, e.g., Zinova & Filip, 2015; Zinova, 2021 for more details). Therefore, here, the lexical/superlexical distinction is set aside and will not be discussed further, given that it plays no role in the proposed arguments.

Derived imperfective verbs are formed from perfective verbs, both primary and derived. One common derivational pattern involves the imperfectivizing suffix, which exhibits at least some traits of functional (inflectional) morphology, but it applies to only some perfective stems, its distribution over perfective stems is not fully predictable. Moreover, its application may induce changes in lexical meaning that go beyond aspect change (see further below).

THE PERFECTIVE PARADIGM comprises two main morphological classes: root (primary or underived) perfective verbs and derived perfective verbs.

**Primary (underived, simplex) perfective verbs** constitute a relatively small class.[4] Some examples from Czech and Russian are given below:

(1) Primary (underived, simplex) perfective verbs

| | | | |
|---|---|---|---|
| *dát*$^{\text{PFV}}$ | *skočit*$^{\text{PFV}}$ | *říci*$^{\text{PFV}}$ | Czech |
| give.INF | jump.INF | say.INF | |
| 'to give' | 'to jump', 'to leap' | 'to say' | |
| *rešit'*$^{\text{PFV}}$ | *leč'*$^{\text{PFV}}$ | *kupít'*$^{\text{PFV}}$ | Russian |
| decide.INF | lie.down.INF | buy.INF | |
| 'to decide' | 'to lie down' | 'to buy' | |

All primary perfective verbs are EVENT-denoting. EVENT is here used with reference to one of the three main aspectual classes EVENT, PROCESS, and STATE (Mourelatos, 1978; Bach, 1981, i.a.). As many semanticists agree, verbs have as part of their meaning an eventuality type which can be classified into one of these three main aspectual classes.

**Derived perfective verbs** make up the majority of perfective verbs, whereby most are derived by means of prefixation. Each Slavic language has about twenty verb prefixes,

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which are used for this purpose. For instance, Šmilauer (1968/1971, p. 165) lists the following Czech verb prefixes:

(2) Šmilauer (1968/1971, p. 165): Czech verb prefixes
1. *do-*, 2. *na-*, 3. *nad-*, 4. *o-*, 5. *ob-*, 6. *od-*, 7. *po-*, 8. *pod-*, 9. *pro-*, 10. *pře-*, 11. *před-*, 12. *při-*, 13. *roz-*, 14. *s-(sou-)*, 15. *u-*, 16. *v-*, 17. *vy-*, 18. *vz-*, 19. *z-*, 20. *za-*.

The above list is given without English translations, given that Slavic verb prefixes exhibit a high degree of homonymy and polysemy, and for a number of them it is difficult to specify their core meaning(s). One and the same prefix may have different meanings/uses when applied to different verbs, even if they belong to the same coherent lexical semantic class. Their meanings are not always compositional, but often partially or fully lexicalized. There is as yet no comprehensive and adequate account of Slavic verb prefixation that would provide correct predictions about their distribution and meanings, be it in a particular Slavic language or across Slavic languages, although there are studies that address with some success certain systematic uses of a given prefix, or a given subset of prefixes (see, e.g., Spencer & Zaretskaya, 1997; Filip, 2003, 2005a; Filip & Carlson, 2001; Kagan, 2011; Kagan, 2012; Braginsky, 2008; Zinova, 2021, to give just a few examples).

Formally speaking, verb prefixes are applied to (i) primary imperfective bases (3), (ii) primary perfective bases (4), or (iii) prefixed perfective bases (5), which means that more than one prefix can be 'stacked' on the same verb. These would be at least the most common prefixation patterns, and they are illustrated below with examples from Czech.

(3) A prefixed perfective verb derived from a primary imperfective verb

| | | | |
|---|---|---|---|
| *štěkat*$^{\text{IPFV}}$ (primary V) | → | *poštěkat*$^{\text{PFV}}$ | Czech |
| bark.INF | | PREF.bark.INF | |
| 'to (be) bark(ing)' | | 'to bark a little';<br>metaphorically: 'to bicker', 'to squabble' | |

(4) A prefixed perfective verb derived from a primary perfective verb

| | | |
|---|---|---|
| *dát*$^{\text{PFV}}$ (primary V) | → | *rozdat*$^{\text{PFV}}$ |
| give.INF | | PREF.give.INF |
| 'to give' | | 'to give away', 'to hand out' |

(5) A prefixed perfective verb derived from a prefixed perfective verb ('stacking' of more than one prefix on the same verb)

| | | |
|---|---|---|
| *rozdat*$^{\text{PFV}}$ | → | *porozdat*$^{\text{PFV}}$ |
| PREF.give.INF | | PREF.DISTR.give.INF |
| 'to hand out',<br>'to give away' | | 'to distribute' |

The constraints governing the combinations of two or more prefixes on the same verb pose a number of challenges and puzzles. Some semantic constraints on their combination are proposed in Filip (2003). Given that Slavic verb prefixes often have one-directional path meanings or have meanings that are akin to those of vague measure phrases (see more below), these constraints draw on the grammar of measurement of concrete physical objects and of (directed) paths, and their interaction in the computation of telic (quantized) and atelic (cumulative) interpretation of verbs on which they occur.

There is also a minor derivational pattern for the formation of perfective verbs by means of the semelfactive suffix. It is realized by the combination of the consonant *-n-* with one vowel, e.g., *-nu-* in Russian, or with a diphthong, e.g., *-nou-* in Czech.[5] The semelfactive suffix has a meaning that amounts to that of the adverb 'once' and forms

perfective verbs denoting quantized predicates of singular EVENTS, of relatively short duration. In the relation between perfective verbs with the semelfactive suffix, which are EVENT-denoting and quantized, and their corresponding imperfective verbs, which are PROCESS-denoting and cumulative, the semelfactive suffix functions as an 'EVENT-unit' extracting or measuring operator (Filip, 1993, 1999), which extracts a 'bounded portion' of the type denoted by the corresponding imperfective verb.

(6) The relation between a perfective semelfactive verb with the semelfactive suffix and a primary imperfective verb:[6]

| | | |
|---|---|---|
| *vzdychat*$^{\text{IPFV}}$ | *vzdych**nout***$^{\text{PFV}}$ | Czech |
| sigh.INF | sigh.**SEMEL**.INF | |
| 'to sigh multiple times', 'to be sighing' | 'to sigh once' | |

The semelfactive suffix can occur on the same verb with one or more prefixes:

(7) A prefixed perfective verb with the semelfactive suffix

| | | |
|---|---|---|
| *odsed**nout***$^{\text{PFV}}$ *si* | *poodsed**nout***$^{\text{PFV}}$ *si* | Czech |
| away.sit.**SEMEL**.INF REFL | ATT.away.sit.**SEMEL**.INF REFL | |
| 'to sit down away from' | 'to scooch down a bit away from' | |
| | 'ATT': attenuative | |

THE IMPERFECTIVE PARADIGM comprises two main morphological classes: Primary (underived, simplex) imperfective verbs and secondary (derived) imperfective verbs.

**Primary (underived, simplex) imperfective verbs** account for the majority of root (primary, underived) verbs, while root perfectives constitute a relatively small class, as mentioned above. Unlike primary perfectives which are EVENT-denoting, primary imperfectives denote either PROCESSES or STATES.

(8) A primary (underived, simplex) imperfective verb Czech

*psát* IPFV
write.INF
'to write', 'to be writing'

**Secondary (suffixed) imperfective verbs** constitute a large subset of derived imperfective verbs by means of the imperfectivizing suffix, glossed with 'IPFV'.[7] It is applied to (i) perfective primary bases, or (ii) perfective bases that are derived by means of prefixes. The following examples are taken from Czech:

(9) A secondary (suffixed) imperfective verb derived from a primary perfective verb:

| | | |
|---|---|---|
| *dát*$^{\text{PFV}}$ (primary V) | → | *dávat*$^{\text{IPFV}}$ |
| give.INF | | give.IPFV.INF |
| 'to give' | | 'to give'/'to be giving' |

(10) A secondary (suffixed) imperfective verb derived from a prefixed perfective verb

| | | |
|---|---|---|
| *rozdat*$^{\text{PFV}}$ | → | *rozdávat*$^{\text{IPFV}}$ |
| PREF.give.INF | | PREF.give.IPFV.INF |
| 'to give away', 'to hand out' | | 'to give away'/ 'to be giving away' 'to (be) hand(ing) out' |
| *porozdat*$^{\text{PFV}}$ | → | *porozdávat*$^{\text{IPFV}}$ |
| DISTR.PREF.give.INF | | DISTR.PREF.give..IPFV.INF |
| 'to distribute', | | 'to distribute'/'to be distributing' |

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While primary imperfectives are formally unmarked for imperfectivity, the imperfectivizing suffix marks a verb as imperfective (setting aside biaspectual verbs formed with the imperfectivizing suffix, see, e.g., Zinova & Filip, 2015; Zinova, 2021). Its meaning covers the whole semantic domain of imperfectivity, or 'general imperfectivity' (see Comrie, 1976), i.e., both its episodic and generic subdomains, as bona fide imperfective operators in other languages do (e.g., in Romance languages). The meaning of the imperfective operator carried by the imperfectivizing suffix can be characterized in terms of the mereological part-of '<' relation that allows us to cover its uses in imperfective sentences with a progressive reading, in contexts where they are interchangeable salva veritate with corresponding sentences with perfective verbs, and also in imperfective sentences used with the general factual, or simple denotative meaning, conveying the bare fact that a given eventuality occurred, without any implication of progressive or generic reading (see Filip, 1993, 1999).

The semantic function of the imperfectivizing suffix in Slavic languages is often erroneously characterized in terms of the progressive operator, as it is, e.g., instantiated by the progressive construction in English. It is predicated on the mistaken assumption that its use in imperfective sentences with a progressive reading is its main or only function (e.g., Zucchi, 1999; Kratzer, 2004; Borer, 2005, among many others), and, as such, it derives predicates that mimic the behavior of atelic predicates (e.g., Kratzer, 2004; Borer, 2005, and others). Closely related to this idea, and equally implausible, are proposals that the Slavic imperfectivizing suffix uniformly derives atelic predicates, or alternatively, predicates of homogeneous eventualities (see, e.g., Minor et al., 2022), or predicates of states.

As will be argued in connection with the formal and semantic properties of secondary imperfectives in Section 5.2, the Slavic imperfective operator carried by the imperfectivizing suffix cannot be equated with the progressive operator. Moreover, the imperfective and progressive operators cannot be analyzed as uniformly yielding atelic predicates, homogeneous predicates, or predicates denoting states (*pace*, e.g., Ramchand, 2018 and references therein). Other than the fact that the progressive reading is just one among other contextually determined readings of imperfective forms with the imperfectivizing suffix, and by far not the default, core, or only reading of such forms, among other arguments showing why such proposals are implausible is the fact that they cannot provide any account, or any satisfactory account, for one of the fundamental phenomena in the domain of aspect, namely, for the imperfective paradox (D. R. Dowty, 1977; D. Dowty, 1979) or partitive puzzle (Bach, 1986).

THE GENERIC PARADIGM. Slavic languages also have a dedicated marker of genericity, and its citation form is commonly given as *-va-* (see, e.g., Genis et al., 2021). It is productive in Czech and Slovak, and to a lesser extent also in Polish (West Slavic languages). As Filip and Carlson (1997) and Filip (2026) argue, it is a generic morpheme sui generis, which is only applied to imperfective bases of imperfective verbs that alternate between generic and episodic interpretations, depending on context, and derive verbs that only have a generic interpretation in all their uses. This morpheme, therefore, cannot be confounded or equated with the imperfectivizing suffix that applies to perfective stems and derives imperfective verbs that alternate between generic and episodic interpretations, depending on context. Moreover, while verbs marked with the generic morpheme pass some standard tests for imperfectivity in Slavic languages (e.g., acceptable as complements of the future auxiliary) have a number of properties that do not fit under the imperfective paradigm which comprises primary and secondary imperfective verbs.

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## 3. The Imperfect Inflectional Status of Slavic Imperfectivizing Suffixation

One productive pattern of Slavic verb suffixation systems involves the derivation of so-called secondary imperfective verbs by means of the imperfectivizing suffix from perfective verb stems. It relates two verb forms that share the same stem (or root), and if they also have the same lexical meaning, they form an aspectual pair, i.e., two aspectually differentiated forms of the same lexeme.

The Slavic imperfectivizing suffix is not a full-fledged grammatical (inflectional) marker of imperfectivity, on par with bona fide grammatical (inflectional) markers of the core categories of the TMA system, such as the tense suffixes in English, for instance. In what follows, its formal and semantic properties will be addressed in some detail. Given that there is no other gram/marker of Slavic aspect systems that would come close to qualifying as a grammatical (inflectional) marker of aspect, this then supports the view that verb aspect in Slavic languages is a predominantly lexical-derivational category, as I argue.

In addition to its fully predictable imperfectivizing function, the Slavic imperfectivizing suffix may also induce changes in lexical meaning that go beyond aspect change. This feature of the imperfectivizing suffix tends to be downplayed or even ignored. For instance, in the Czech derivational sequence below, all three verbs have uses in which they denote the same eventuality type of greeting, but only the secondary imperfective with the IPFV suffix also has a related, lexically conventionalized, meaning of 'to (be) send(ing) regards':

(11) The imperfectivizing suffix IPFV inducing lexical semantic changes

| root IPFV | → | prefixed PFV | → | secondary IPFV | Czech |
|---|---|---|---|---|---|
| *zdravit* | | *pozdravit* | | *pozdravovat* | |
| greet.INF | | PREF.greet.INF | | PREF.greet.IPFV.INF | |
| 'to (be) greet(ing)' | | 'to greet' | | 'to (be) greet(ing)', 'to (be) send(ing) regards' | |

Formally speaking, the Slavic imperfectivizing suffix applies to perfective bases, provided they are not derived with the semelfactive suffix (as in (6), which means that it only applies to primary perfective bases, as in (9), or prefixed ones, as in (10). However, it does not apply across the board to all such perfective bases. As Kuznetsova and Sokolova (2016), for instance, reported in the Russian National Corpus (RNC), only over one-third of prefixed perfectives has corresponding secondary imperfectives derived from them by means of the imperfectivizing suffix: namely, 733 verbs out of 1981 (37%). Moreover, a substantial number of these secondary imperfectives have a very low frequency. 203 secondary imperfectives are attested in two to nine examples, and 95 have only one attested occurrence. The productivity and application constraints of the imperfectivizing suffix differ across Slavic languages (see, e.g., Wiemer & Seržant, 2017), and when it may (not) apply to a given perfective verb stem is not always fully predictable, and in many cases a matter of lexical idiosyncrasy. In fact, it remains one of the outstanding puzzles and challenges of Slavic linguistics.

There is a traditional rule of thumb for its application, which is surprisingly taken for granted by many Slavicists (see, e.g., Maslov, 1948; Forsyth, 1970, i.a.), which depends on two related, and highly dubious, concepts in Slavic aspect studies: namely, a 'lexically empty prefix' and an 'aspectual pair'. Both notions depend on rather unclear criteria and subjective judgments concerning whether a given prefix that derives a perfective verb also adds lexical meaning to it which goes beyond that of perfective aspect. Consider the following Russian examples with the prefixes *vy-* and *na-*.

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(12) Russian: Prefixed PFV and suffixed secondary IPFV forms

| | | |
|---|---|---|
| root IPFV | *pisat'* | |
| | write.INF | |
| | 'to write', 'to be writing' | |
| prefixed PFV | ***na**pisat'* | ***vy**pisat'* |
| | PREF.write.INF | PREF.write.INF |
| | 'to write (up)' | 'to write out' |
| suffixed IPFV | — | ***vypisyv**at'* |
| | | PREF.write.**IPFV**.INF |
| | | 'to write out', |
| | | 'to be writing out' |
| | | *aspectual pair* |

The prefixes *vy-* and *na-* are here attached to the same base of the primary imperfective verb *pisat'* 'to write'/'to be writing', but only *na-* is taken to qualify as a 'lexically empty prefix', but not *vy-*, according to the traditional reasoning. That is, as part of the prefixed verb *napisat'* 'to write (up)', *na-* is taken to only have a perfectiving function, and hence, the prefixed perfective verb *napisat'* 'to write (up)' and its morphologically related primary (underived, simplex) imperfective verb *pisat'* 'to write'/'to be writing' are claimed to form an aspectual pair: namely, two aspectually differentiated forms of the same lexeme WRITE. The existence of this aspectual pair in effect preempts the application of the imperfectivizing suffix to the prefixed perfective verb *napisat'* 'to write (up)', because it is already 'aspectually paired'. This reasoning presupposes that the sole function of the imperfectivizing suffix is to form an imperfective verb with the same lexical meaning as that of its perfective base.

In contrast, in the prefixed perfective verb *vypisat'* 'to write out', 'to write out', also 'to discharge from' (e.g., hospital), 'to make a note', i.a., the prefix *vy-* is taken not to be 'lexically empty', because it also introduces lexical meaning changes in addition to its perfectivizing function. Consequently, this prefixed verb and its derivationally related primary imperfective verb *pisat'* 'to write'/'to be writing' do not form an aspectual pair. It is then the job of the imperfectivizing suffix, according to the traditional line of reasoning, to derive from the prefixed perfective base of *vypisat'* its suffixed secondary imperfective counterpart with the same lexical meaning with which it is then aspectually paired. Indeed, it is fair to assume that *vypisat'* and *vypisyvat'* are two aspectually distinguished forms of the same lexeme, and so an aspectual pair.

As a rule of thumb, it is claimed that the imperfectivizing suffix and a lexically empty prefix cannot co-occur on the same verb. This traditional line of reasoning, which focuses on the role of the imperfectivizing suffix in forming aspectual pairs, is tied to the overarching and widespread idea that Slavic verb systems are generally organized in aspectual pairs: namely, in Slavic verb systems there exist two parallel sets of verb forms to one and the same lexeme, perfective and imperfective, carrying identical lexical meaning (e.g., Forsyth, 1970, p. 1; Mourelatos, 1978; Binnick, 1991, among many others). The imperfectivizing suffix serves as a means to respond to the pressure of the system to ensure that verb lexemes are realized in aspectual pairs, when prefixed perfective verbs contain prefixes that are not lexically empty, and so such perfectives do not form an aspectual pair with their derivationally related unprefixed primary (underived, simplex) imperfective bases. They are then aspectually paired with their corresponding suffixed secondary imperfective counterparts derived from them with the imperfectivizing suffix.

The main problem with this traditional line of argumentation lies with its key explanatory ingredients, namely the ill-defined notions of the 'lexically empty prefix' and 'aspectual pair', which ultimately also make the associated claim that Slavic verb systems are organized in aspectual pairs implausible. There are no (reliable) criteria given for either the notion of a 'lexically empty prefix' or 'an aspectual pair', but instead subjective intuitions, which vary across different speakers, govern the judgments about semantic relations between verbs that are derivationally related by means of prefixes. Moreover, the reasoning is prone to circularity. 'Lexically empty prefixes' are taken to generate aspectual pairs of the same lexeme. At the same time, subjective intuitions about what is an aspectual pair, i.e., two aspectually differentiated forms of the same lexeme, guide the decisions whether a given (use of a) prefix is 'lexically empty'.

To illustrate some of the problems related to the application of these two key notions, we observe that there are perfective verbs with prefixes that appear to be 'lexically empty', and yet the imperfectivizing suffix *does* apply to them. In (11), for instance, the prefix *po-* appears to have the perfectivizing function only, not inducing any other meaning changes in addition to aspect. Hence, the primary imperfective verb and its corresponding *po*-prefixed perfective verb should count as an aspectual pair, and the derivation of the suffixed secondary imperfective verb should be blocked, but it is not.

And vice versa, there are perfective verbs with prefixes that are *not* lexically empty, and yet the application of the imperfectivizing suffix to them is *not* sanctioned. In the following Czech example, the prefix *na-* has a use that is traditionally classified as falling under the '(ac)cumulative' Aktionsart, here glossed as ACM.

(13) Czech: the accumulative (ACM) use of the prefix *na-*

| root IPFV | → | prefixed PFV | → | secondary IPFV |
|---|---|---|---|---|
| *péct* | | *napéct* | | – |
| bake.INF | | ACM.bake.INF | | |
| 'to bake', | | 'to bake a lot (of x), | | |
| 'to be baking' | | a (relatively/sufficiently) | | |
| | | large quantity of *x*, | | |
| | | many *x*, much *x*' | | |

From the primary imperfective verb *péct* 'to bake'/'to be baking' the prefix *na-* derives the prefixed perfective verb *napéct* meaning 'to bake a lot (of x)'/'a relatively large quantity of x', 'many/much x'. Apart from its perfectivizing function, it also contributes the vague quantificational or measurement meaning to the resultant prefixed perfective verb (see, e.g., Filip, 1992, 2000, 2005a, and further below). Given that these two derivationally related verbs do not form an aspectual pair, following the traditional reasoning, the imperfectivizing suffix should apply to the prefixed perfective verb in order to derive the suffixed secondary imperfective with which that prefixed perfective verb could be aspectually paired. But this prediction is not borne out.

It is worth mentioning that the distinction between lexical and superlexical prefixes plays no role in the distribution of the imperfectivizing suffix over prefixed perfective verbs. Those who draw a line between lexical and superlexical prefixes also observe that the imperfectivizing suffix in Slavic languages can apply to prefixed perfective verbs with either type of prefix, see, e.g., Biskup (2023). This provides further argument in support of the position taken here that the lexical/superlexical distinction among Slavic prefixes is hardly grammatically relevant in the system of Slavic verbs.

We also observe differences across Slavic languages with respect to the distribution of the imperfectivizing suffix. For instance, given two different Slavic languages that have cognate prefixed perfective stems with the same morphological structure and the same meaning, we observe that the imperfectivizing suffix applies to the prefixed perfective

stem in one language, but not in the other. For instance, consider the following Czech and Russian examples:

(14) Cross-linguistic differences in the application of the IPFV suffix

| root IPFV | → prefixed PFV | → suffixed IPFV | |
|---|---|---|---|
| *pít*<br>drink.INF<br>'to (be) drink(ing)' | *vypít*<br>PREF.drink.INF<br>'to drink (up)' | – | Czech |
| *pit'*<br>drink.INF<br>'to (be) drink(ing)' | *vypit'*<br>PREF.drink.INF<br>'to drink (up)' | *vypivat'*<br>PREF.drink.IPFV.INF<br>'to (be) drink(ing) up'<br><br>'to consume'/'to be consuming alcohol' | Russian |

The prefix *vy-* in Czech and Russian derives from a primary imperfective verb *pít* (Czech)/*pit'*(Russian) 'to (be) drink(ing)' a prefixed perfective verb with the meaning of 'to drink up'. In order to motivate why the imperfectivizing suffix can only apply to the prefixed verb in Russian, but not in Czech, we would have to argue that in Czech *vy-* is 'lexically empty', while in Russian it is not. But this would render the notion of a 'lexically empty prefix' useless.

In summary, the distribution of the imperfectivizing suffix over prefixed perfective verb stems should suffice to show that it is the lexical semantics of prefixes that is at the core of puzzles posed by the properties of morphologically complex Slavic verbs. It is one of the main goals of this paper to address the quintessentially lexical-derivational nature of Slavic verb prefixes, and the rejection of the notion of 'lexically empty prefixes', 'perfective prefixes, 'purely perfectivizing prefixes' and the like in Slavic languages, and by the same token the rejection of the related claims that they are grammatical markers of perfective aspect, often taken to be located at the level of outer aspect (see also Filip, 1992, and elsewhere).

## 4. Slavic Verb Prefixes, Grammatical Aspect, and Aspectual Classes

The claim that Slavic aspect systems are primarily of lexical-derivational nature mainly rests on arguments showing that Slavic verb prefixes have formal and semantic properties precluding their treatment as inflectional, grammatical markers of perfective aspect (see Filip, 1992, 1993, 1999, and elsewhere); i.e., they do not carry a uniform function for the interpretation of perfective aspect, and neither is the telicity of Slavic verbs predictably linked to telicity, which is often taken to correspond to the interpretation of the perfective operator.

This claim does not mean that there is no relation between verb prefixes and the perfective operator introduced by perfective forms. Their shared meaning can be represented by means of the phonologically null $\text{MAX}_e$ operator (see Filip & Rothstein, 2005; Filip, 2008, 2017). The meaning that a prefix assumes in a given perfective verb contributes to specifying the conditions for the application of $\text{MAX}_e$, and it has effects on the limited variation in the meanings of maximal predicates that $\text{MAX}_e$ derives. The interaction between Slavic verb prefixes and $\text{MAX}_e$ will be discussed in detail in Section 6.4. Here, I would like to outline how Slavic verb prefixes are connected to grammatical aspect, on the one hand, and aspectual classes (or also lexical aspect), on the other hand, to set the stage for their discussion in this paper.

https://doi.org/10.3390/languages11010005

Slavic verb prefixes, on the view endorsed here, belong to (lexical-)derivational morphology. Their lexical semantic contribution is calculated at the level of base EVENTUALITY DESCRIPTIONS. As is common in event semantics, verbs have as a part of their lexical meaning a set of eventualities, or are EVENTUALITY DESCRIPTIONS. They are classified into aspectual classes, which fall into two main classes: TELIC and ATELIC. In terms of a tripartite classification, the TELIC class corresponds to EVENTS, while the ATELIC class to PROCESSES, possibly also together with STATES. This classification is also a classification of base uninflected predicates, i.e., uninflected predicates with all their argument positions filled by constants or variables (see (15), and also, e.g., De Swart, 1998; Zucchi, 1999): e.g., *win a race, read a letter, bake a turkey, arrive at the station, know French, be tall*. Generally, grammatical aspect operators are aspectually neutral in so far as they apply to eventuality descriptions carried by base uninflected predicates of any aspectual class, i.e., states, processes or events. For instance, in English the progressive operator applies to predicates of events (accomplishments or achievements), as in *The golf ball rolled into the hole* or *The train was arriving at the station*. It also applies to predicates of processes (e.g., *John was playing golf*) and predicates of states (e.g., *John is resembling his uncle more and more, The book was lying on the desk*).

Tense operators introduce existential closure over sets of eventualities that are the output of grammatical aspect operators. This amounts to the following schematic representation:

(15) Tense, grammatical aspect operators and aspectual classes

| | | |
|---|---|---|
| (Tense Op | (Grammatical Aspect Op | (Eventuality Descriptions))) |
| | PFV, IPFV, PROG, . . . | ATELIC: STATE, PROCESS |
| | | TELIC: EVENT |
| | outer aspect | inner aspect |

Slavic verb prefixes, semantically speaking, function as modifiers of eventuality descriptions mapping sets of eventualities of one aspectual type onto sets of eventualities of some possibly other type. For instance, adding a prefix to an imperfective stem denoting a predicate of STATES often yields a new perfective verb denoting inchoative predicates of EVENTS: *vlastnit* (ipfv) 'to own' > *přivlastnit (si)* (pfv) 'to acquire', 'to appropriate'; *znát* (ipfv) 'to know' > *poznat* (pfv) 'to get to know', 'to find out', 'to learn' (Czech). The semantic level of EVENTUALITY DESCRIPTIONS, and their classification into aspectual classes, corresponds to syntactic structures at the level of inner aspect (aspectual classes, or situation aspect in the sense of Smith, 1991). Put in syntactic terms, Slavic verb prefixes operate at the level of inner aspect.

The imperfectivizing suffix, which has at least some properties of a grammatical (inflectional) marker of imperfectivity (see Section 3 above), belongs to a higher level of grammatical aspect operators, along with the perfective operator, which in Slavic languages, as I argue, is a phonologically null operator, whose interpretation corresponds to the MAX(e) operator. Both are located at the syntactic level of outer aspect (or viewpoint aspect in the sense of Smith, 1991). Based on the predominant pattern by which secondary imperfective verbs are formed, the Slavic imperfectivizing suffix marks the verb as imperfective, and in the derivational history of the verb it applies to the verb stem after the process of prefixation. This is in compliance with the idea that Slavic verb prefixes operate at the level of inner aspect and below the higher imperfectivizing suffix at the level of outer aspect. The derivational histories of morphologically complex verbs that have one or more prefixes co-occurring with the imperfectivizing suffix, as in as in (10) above, can be quite complex. It is not always clear whether the imperfectivizing suffix is the last affix that is applied, and what the grammatical aspect of the resulting verb containing the imperfectivizing suffix is, whether it is imperfective or bi-aspectual, i.e., it can occur in contexts that either

require what is unambiguously a perfective or an imperfective verb (see Zinova & Filip, 2015; Zinova, 2021).

It may also be mentioned that there are occasional claims that in the derivational histories of some verbs, the imperfectivizing suffix is not the last affix applied, but rather a prefix, and the whole verb is perfective. For instance, consider the following Russian sentence with the verb (highlighted in bold face) in which the prefix *pere-* co-occurs with the imperfectivizing suffix:

(16) *Razbojnik* ***pere-otkry-va-l*** *(vse)* *dveri*. Russian
thief prf-open-yva-pst-m all doors
'The thief opened (all) the doors.' Tatevosov (ms, cited in Ramchand, 2025)

As Ramchand (2025) reports, Tatevosov (unpublished manuscript) claims that in the derivation of this verb, the prefix *pere-*, which crucially is claimed to have a distributive use here, is applied after the imperfectivizing suffix, because the whole verb is perfective. If so, this would be an exception to the generalization that Slavic verb prefixes are lexical-derivational morphemes that operate at the level at which aspectual classes of eventuality descriptions are determined, and so are located at the level of inner aspect, in the scope of the imperfectivizing suffix at the higher level of outer aspect.

There are, however, observations and arguments based on which we may conclude that the reported distributive use of the prefix *pere-*, as in the above, example, is a rather specious, and at best a marginal, piece of data, which does not invalidate the generalization that Slavic verb prefixes scope under the imperfectivizing suffix, barring bi-aspectual verbs (see Zinova & Filip, 2015; Zinova, 2021), and verbs with the imperfectivizing suffix are predominantly imperfective. (*pace* Ramchand, 2025, Tatevosov, ms). Here, without going into detailed empirical and theoretical arguments, let me briefly adduce just four prima facie observations in support of this claim. First, the Russian prefix *pere-* has a number of uses. Svedova (1982) distinguishes ten different uses, for instance, including spatial, temporal, comparative, iterative, excessive, and also distributive. The dominant use of *pere-* in *pereotkryvat'*, however, is by far not its distributive use, but rather its iterative use, and on this iterative reading, the whole verb is imperfective. Russian online dictionaries agree in characterizing the meaning/use of *pereotkryvat'* with the iterative paraphrase, such as, e.g., *dělat' to že otkrytie ešče raz* (lit.: 'to do the same opening once more'), often with reference to the Russian linguist Zaliznjak, and classifying it as imperfective.[8]

Second, native speakers naturally interpret sentences with *pereotkryvat'* as having an iterative interpretation. The distributive reading must be enforced by explicit distributive expressions (e.g., 'one after another', 'successively'), but even then some native speakers find it odd ('?'), or even unacceptable ('*').

Third, one of the standard tests for the perfective grammatical status of verbs in Russian is the compatibility with the time-span adverbial '*za*/in + [measure of time]'. However, *pereotkryvat'*, on its intended distributive interpretation, does not seem to be fully acceptable, as judged by at least some native speakers. But this means that if *pereotkryvat'* has an acceptable distributive interpretation, its grammatical perfective status is not entirely uncontroversial.

## 5. Slavic Perfectivity and Telicity Is Not Predictably Linked to (a Set of) Verb Prefixes

### *5.1. Slavic Perfectivity Is Not Formally Marked by Verb Prefixes*

Given that most Slavic perfective verbs are prefixed, any treatment of Slavic perfective aspect hinges on the analysis of verb prefixation. Theoretical claims about the role of Slavic verb prefixes in Slavic aspect systems are typically shaped by one dominant derivational

pattern by which perfective verbs are formed; namely, the derivation of prefixed perfective stems from primary, and so unprefixed, imperfective stems:

(17) $[V_{ROOT}]_{\mathbf{ipvf}} > [PREFIX.V_{ROOT}]_{\mathbf{pfv}}$

There are some exceptions to (17), namely prefixed outputs that are not perfective, but they can be safely ignored for the purposes of the arguments to be made here.[9] Most importantly, to virtually each primary imperfective base we typically have an array of perfectives, derived from it by means of different prefixes. This can be illustrated with the following Russian example:

(18) Russian: Prefixed PFV Vs derived from the same IPFV root

| root (primary) IPFV V | → | prefixed PFV V (prefix in bold) |
|---|---|---|
| *pisat'* | | ***do****pisat'* 'to finish writing' |
| write.INF | | ***nad****pisat'* 'to superscribe', 'to dedicate' |
| 'to write', | | ***na****pisat'* 'to write up', 'to finish writing' |
| 'to be writing' | | ***o****pisat'* 'to describe', 'to depict' |
| | | ***pere****pisat'* 'to rewrite' |
| | | ***pri****pisat'* 'to attribute', 'to ascribe to' |
| | | ***s****pisat'* 'to write off', 'to copy' |
| | | ***v****pisat'* 'to inscribe', 'to insert', 'to record' |
| | | ***vy****pisat'* 'to write out', 'to prescribe', 'to discharge' |
| | | ***za****pisat'* 'to write down', 'to record' |

All the prefixed perfective verbs in (18) have lexical meanings that vary in various degrees from that of their shared imperfective base form, due to the different contributions of the prefixes they contain. The usage frequency of different prefixed verbs listed above differs, depending on their meaning/use and domain of discourse. While the prefixed perfective verb *napisat'* 'to write up' is often cited as the natural, preferred, default counterpart of the imperfective verb *pisat'* (ipfv) 'to write', 'to be writing', and the two aspectually differentiated verbs are adduced as an example of an aspectual pair par excellence, there are contexts in which other perfective verbs than *napisat'* (pfv) 'to write up' may be the preferred or the only option.

The preponderance of the derivational pattern given in (17) is one motivating factor for the long-standing and widespread claims that Slavic languages have 'perfective prefixes' (e.g., Slabakova, 1997; Babko-Malaya, 2003; van Hout, 2008; Łaziński, 2020, to give just a few among many examples, see references therein), meaning that Slavic verb prefixes are grammatical (inflectional) markers of perfectivity (see also Binnick, 1991 and references therein).

To give one concrete example illustrating this widespread claim, according to Borer (2005), Slavic verb prefixes are grammatical markers of perfectivity, on a par with English inflectional suffixes like the past tense suffix *-ed* or the plural suffix *–s*: "The perfective marking by means of a prefix is the phonological realization of a head feature which assigns range to [$_{ASPQ}$ <e>$_{\#}$], much on a par with the way that past tense marking is the phonological spellout of a head feature which assigns range to [$_{TP}$ <e>$_{T}$], and 'plural' marking a phonological spellout of a head feature assigning range to [$_{CL}$ Max <e>$_{DIV}$]" (Borer, 2005, p. 159, Chapter 15, Volume II).

What all such claims share can be summed up in pretheoretical terms as follows:

(19) *Common Claim 1*: Perfectivity, taken as a formal category of grammatical aspect, is predictably linked to verb prefixes in Slavic languages; Slavic verb prefixes are grammatical (inflectional) markers of perfectivity.

The *Common Claim 1* is related to an overarching claim about the organization Slavic verb systems:

(20) *Common Claim 2*: Slavic verb systems are generally arranged in aspectual pairs, i.e., two aspectually differentiated forms carrying identical lexical meaning. Corollary: There are 'lexically empty' verb prefixes, i.e., verb prefixes that only have a perfectivizing function and contribute no other meaning beyond that of perfective aspect.

For instance, according to Forsyth (1970, p. 1), in Russian, "generally speaking there exist two parallel sets of verb forms carrying identical lexical meaning, i.e., denoting one and the same type of action. (. . . ) corresponding to (. . . ) the verb 'to write', Russian has two sets of forms: imperfective (. . . ) *pisat'* and perfective (. . . ) *napisat'* [see (12) above, HF]. I shall refer to them indifferently as, e.g., 'the verb *pisat'/napisat*', 'the pair of verbs *pisat'/napisat*'".

Forsyth's old claim is still a good illustration of contemporary common characterizations of the Russian aspect, and analogous statements are still often made for other Slavic languages, as well. One of the problems with such characterizations lies in the key notion of an 'aspectual pair', i.e., two aspectually differentiated forms of the same lexeme. As already mentioned above, it is based on subjective judgments regarding the meanings of particular (unprefixed) imperfective stems and their derivationally related prefixed perfective counterparts, and the related 'test' of incompatibility of the imperfectivizing suffix with an alleged 'lexically empty' prefix on the same verb. Not surprisingly therefore, there is also some confusion about what an 'aspectual pair' is. For instance, Mourelatos (1978, p. 194) observes that in Russian "verbs articulate themselves in what are known as 'imperfective versus perfective aspectual pairs"', which he illustrates with *lečit'* (IPFV) 'to treat' and *vylečit'* (PFV) 'to cure'. However, it is striking that Mourelatos's English translations clearly indicate that these two verbs, one imperfective and the other perfective, while sharing the same root, have different lexical meanings. Hence, they are not an aspectual pair, because they do not differ only in IPFV/PFV aspect, but also in their idiosyncratic lexical meaning.

As observed above, the notion of an 'aspectual pair' is problematic, just as the related and notoriously flawed notion of a 'lexically empty prefix'. Forsyth's formulation "'the verb *pisat'/napisat*' (Forsyth, 1970, p. 1, above) implies that the prefix *na-* is 'lexically empty' in the Russian perfective verb *napisat'* 'to write up'. However, there is no general agreement which verb prefix(es), among the set of about twenty verb prefixes in each Slavic language, can be taken to have uses that count as 'lexically empty', and if indeed there are any such verb prefixes or their uses. The opinions vary from (i) there being a fairly large number of 'lexically empty' verb prefixes, or their uses, to (ii) there being a fairly delimited, small set, and also, as some propose, (iii) there are none at all.

The first opinion is endorsed by Binnick (1991, p. 137), or Schoorlemmer (1995) (and references therein), for instance, among others, based on Russian data. This view is entirely implausible. As the English translations in (18) indicate, e.g., *rewrite, write in, write down, write up, write out, write off*, and so on, Slavic verb prefixes contribute idiosyncratic lexical meaning modifications to verbs that are akin to those of verb prefixes and particles in English (e.g., *up*, as in *drink up*) or of German verb prefixes (e.g., *auf*, as in *aufessen* 'to eat up'). Just as verb prefixes in German or Dutch, for instance, not all Slavic verb prefixes attach to all verbs, all exhibit homonymy and polysemy, and their meanings are not always compositional, but often partially or fully lexicalized, and have effects on the argument structure of verbs. One and the same prefix may have different meanings/uses when applied to different verbs, even if they belong to the same coherent lexical semantic class (see, e.g., (27b) and (28a) which will be discussed further below). Most Slavic verb prefixes are diachronically related to prepositions or adverbs with locative/directional meanings,

and these meanings are still detectable in at least some of their uses. In all of these respects, Slavic verb prefixes behave like verb prefixes in languages without (perfective) grammatical aspect; for instance, German or Dutch.

The second opinion takes seriously the fact that to each root imperfective verb we typically have an array of perfective verbs that are derived from it by means of different prefixes, as we see in (18). It is then proposed that while there may be no single 'lexically empty' or all-purpose neutral prefix that can be used to perfectivize most or all primary (simplex) imperfectives, for each such imperfective stem there is typically a unique aspectually paired perfective verb formed with a unique 'lexically empty' or 'neutral prefix' (e.g., van Hout, 2008; Łaziński, 2020), just adding perfectivity (for other references see Spencer & Zaretskaya, 1997). However, what is that unique 'lexically empty' or 'neutral prefix' for each primary imperfective verb stem which forms that unique perfective correspondent from it without any change in meaning beyond the change in aspect, cannot be predicted, at least not in any (reliable) way for all the cases. This is confirmed by the fact that Slavic dictionaries typically list in the lexical entry of a given imperfective verb what is taken to be its closest perfective correspondent, prefixed or not, and vice versa. For instance, the Russian imperfective verb *pisat'* 'to write', 'to be writing' will often have as part of its lexical entry the information that its perfective counterpart is the prefixed perfective verb *napisat'* 'to write up'.

We also encounter the idea that there is a fairly delimited set of what are taken to be prefixes with a perfectivizing function forming what are taken to be aspectual pairs, even if they are not lexically 'empty', strictly speaking, and which also tend to be be the most frequently used verb prefixes on perfective verbs. In Czech, for instance, according to Šmilauer (1968/1971, p. 166), the set of most commonly used prefixes comprises *po-*, *vy-*, *za-*, and also *u-*, *na-*, *s-*, and they are also taken to have lexically 'empty' uses. A similar idea seems to motivate Janda (2007) and Janda and Lyashevskaya (2011) in connection with what they refer to as Natural Perfectives (the term coined by Janda, 2007) in Russian. They are formed with "purely perfectivizing" prefixes, whereby the scare quotes (see, e.g., Janda & Lyashevskaya, 2011, p. 215) here indicate that they are not in fact semantically "empty" (also in scare quotes, see, e.g., Janda & Lyashevskaya, 2011, p. 215), hypothesizing that "the selection of prefixes for Natural Perfectives conforms to semantic preferences" (Janda & Lyashevskaya, 2011, p. 215). This hypothesis should motivate the working hypothesis that "Russian verbal prefixes express meaning even when they are used to create a "purely aspectual pair" (. . . ) This is contrary to traditional assumptions that prefixes in this function are semantically "empty". It is worth mentioning that such rather confusing or puzzling statements are not uncommon in studies that grapple with the semantic contribution of prefixes to Slavic perfective verbs. Now, the relevant set of Russian prefixes that occur on Natural Perfectives, according to Janda and Lyashevskaya (2011), is *po-*, *s-*, *za-*, *na-*, *pro-*. Natural Perfectives are claimed to tend to behave like a closed-class category, with a limited type frequency, under 2000 verbs in the Russian National Corpus, and relatively high token frequency, and they usually tend to refer to actions that have "a natural culmination". All of this suggests that this class of perfective verbs relies on vague semantic intuitions, which also seem to guide the associated corpus study in Janda and Lyashevskaya (2011), and hence it is unsurprising that Janda and Lyashevskaya (2011, p. 215) themselves admit that "there is no perfect dividing line between Natural Perfectives and other perfectives". Taken all around, the corpus study reported in (Janda & Lyashevskaya, 2011) is hardly replicable for Russian, let alone for other Slavic languages, and the notion of Natural Perfectives not operationalizable.

Instead of claiming that there are verb prefixes in Russian, or any other Slavic language, which form an aspectual pair with their unprefixed imperfective counterpart, even

if they are not lexically 'empty' strictly speaking, and so in effect redefining the notion of an 'aspectual pair', we might better accept the third perspective on Slavic verb prefixes which involves an unambiguous rejection of the notion of a 'lexically empty' verb prefix. It was already endorsed in traditional, structuralist accounts of aspect (e.g., Isačenko, 1960, 1962; Bondarko, 1971, i.a.).[10] As the above observations already suggest, rejecting the existence of lexically empty prefixes in Slavic languages would seem to be the soundest option, empirically and theoretically speaking (see also Filip, 1992, 1993, 1999, 2000, and elsewhere). In short, this leads me to the conclusion that a primary imperfective verb and its corresponding prefixed perfective verb, instantiating the derivational pattern in (17), never form an aspectual pair (see also, e.g., Isačenko, 1960, 1962). Generally, Slavic verb prefixes, unlike grammatical markers of the TMA system, contribute lexical meaning modifications to verbs, which go beyond the meaning of perfective aspect.

This generalization also applies to the Russian perfective verb *napisat'* (pfv) 'to write up', 'to finish writing', where the prefix *na-* is often analyzed as the lexically empty prefix par excellence, and so *pisat'* (ipfv) 'to write', 'to be writing' with *napisat'* (pfv) 'to write up', 'to finish writing' are often cited as a paradigm example of an aspectual pair (see, e.g., Forsyth, 1970 above). In other Slavic languages, there are cognate perfective verbs built with the prefix *na-* that is attached to the imperfective simplex stem tied to the lexeme WRITE. Contrary to this long-standing and still common view, an argument can be made that *na-* is here not lexically empty, but rather makes a lexical contribution to the verb, albeit subtle, apart from its perfectivizing function. Specifically, it still has a detectable locative/directional sense of 'on(to)', which it shares with its (most likely) diachronically related locative/directional preposition *na-* 'on(to)'. Moreover, it merely appears to be 'lexically empty', because its locative/directional meaning overlaps with a part of the lexical information carried by the primary imperfective *pisat'* (ipfv) 'to write', 'to be writing' to which it is attached (more precisely, to its stem) (see Filip (1993, 1999), and for a related independent observation Comrie, 1976, p. 89).[11] Couched in terms of Fillmore's Frame Semantics (in the sense of Fillmore, 1975, and elsewhere), and using the cognate Czech examples *psát* (ipfv) 'to write', 'to be writing' and *napsat* (pfv) 'to write up', 'to finish writing', Filip (1993, 1999) proposes that *na-* here has as part of its meaning (a set of) writing eventualities that are associated with a FRAME which minimally involves a relation among four participants: a writer (AGENT) who uses some INSTRUMENT that leaves (interpretable) traces (THEME/OBJECT OF CREATION) on some surface (LOCATION). The gradual coming into existence of the object of creation by means of traces *placed on* some surface, thus overlaps with the locative/directional meaning of the preposition *na* 'on(to)'. Indeed, the primary imperfective *pisat'* (ipfv) 'to write', 'to be writing' may optionally co-occur with the *na*-PP 'on(to)'-PP. The same holds true for our Russian examples, as we see in (21):

(21) *pisat'*$^{\text{IPFV}}$ *čto-to* (***na*** *bumagu*) Russian
write.INF something (on paper)
'to write/to be writing something (on (a piece of) paper)'

Crucially, the locative/directional 'on(to)' relation between the THEME/OBJECT OF CREATION (Figure) and the LOCATION (Ground) can also be viewed as evoked by the meaning of the prefix *na-* in *napisat'* (pfv) 'to write (up)', 'to finish writing', and due to the overlap with the lexical information carried by the imperfective simplex stem, it appears to be 'lexically empty' in the perfective verb *napisat'* (pfv) 'to write (up)', 'to finish writing'. This is also supported by the observation that *napisat'* (pfv) may also co-occur with the optional locative/directional *na*-PP 'on(to)'-PP, with which it stands in a kind of semantic concord, whereby the meaning of the verb prefix *na-* is duplicated by its morphologically (and historically) related locative/directional preposition *na* 'on(to)':

(22) ***na****pisat'*PFV *čto-to* (***na*** *bumagu*)
PREF.write.INF something (on paper)
'to write (up) something (on (a piece of) paper)'

The semantic concord between the verb prefix *na-* in the perfective verb *napisat'* (pfv) 'to write (up)', 'to finish writing', and the preposition *na* in (22) instantiates a common pattern that we observe in Slavic languages between verb prefixes and prepositions, but also in other languages with verb prefixes that developed from locative/directional prepositions (e.g., German). An example from Czech is given in (23a) and (23b). The verb prefix *pře-* 'across', which is morphologically (and historically) related to the preposition *přes* 'across', derives from the primary imperfective verb *plavat* 'to (be) swim(ming)', as in (23a), its perfective correspondent, as in (23b). While the imperfective verb is intransitive, the perfective prefixed verb is either obligatorily transitive or takes an obligatory adjunct, the directional *přes*-PP 'across', whereby the prefix *pře-* 'across' stands in a semantic concord with the preposition *přes* 'across'.

(23) a. *plavat*IPFV *(přes řeku)* Czech
swim.INF (across river.SG.ACC)
'to (be) swim(ming) (across the/a river)'

b. *přeplavat*PFV *(*(přes) řeku)*
across.swim.INF (across) river.SG.ACC
'to (be) cross(ing) the/a river by swimming'

If there are no lexically empty (uses of) verb prefixes in Slavic languages, as I argue, and given that many Slavic perfective verbs are formed following the derivational pattern in (17), then the *Common Claim 2* (given in (20)) that Slavic verb systems are *generally* organized in aspectual pairs, i.e., pairs of aspectually differentiated IPFV/PFV forms of the same lexeme, is invalid. Bona fide aspectual pairs are only generated by means of the imperfectivizing suffix applied to perfective verbs, either primary or prefixed, as in (9) and (10), respectively. But, as has been observed above, the imperfectivizing suffix does not apply to many prefixed perfective verbs (see (3)), and when it does apply to a given (prefixed) perfective verb it may derive a secondary imperfective verb with a meaning that is not identical to that of its perfective base. So strictly speaking, we have no aspectual pair in such a case either, and not all uses of the imperfectivizing suffix result in the formation of an aspectual pair.

This conclusion has consequences for the claims about the organization of Slavic verb systems. Rather than claiming that Slavic verb systems are arranged in aspectual pairs, a more empirically adequate view is that Slavic verb systems are arranged in networks of derivationally related verbs, all of which share the same root (see, e.g., Filip, 1992, 1993, 1999, 2000, and elsewhere; similar proposals are also made in Janda, 2007; Sokolova et al., 2013, i.a.). For instance, the array of prefixed perfective verbs in (18) is a part of a larger network of derivationally related perfective and imperfective verbs, all of which share the same root/lexeme WRITE. The prefixed perfective verbs in (18) may also serve as inputs to prefixation, as we see in (24). And from such new prefixed perfective verbs, which contain more than one prefix, secondary imperfectives may be derived by means of the imperfectivizing suffix:

https://doi.org/10.3390/languages11010005

(24) Russian: A network of derivationally related PFV and IPFV Vs

| primary IPFV | → | prefixed PFV | → | prefixed PFV |
|---|---|---|---|---|
| *pisat'* | | ***pere****pisat'* | | ***dopere****pisat'* |
| write.INF | | ITER.write.INF | | COMP.ITER.write.INF |
| 'to write', | | 'to rewrite' | | 'to finish rewriting' |
| 'to be writing' | | | | |
| | | ↓ | | ↓ |
| | | secondary IPFV | | secondary IPFV |
| | | ***pere****pisyvat'* | | ***dopere****pisyvat'* |
| | | ITER.write.IPFV.INF | | COMP.ITER.write.IPFV.INF |
| | | 'to rewrite', | | 'to (be) finish(ing) |
| | | 'to be rewriting' | | rewriting' |

COMP: completive
ITER: iterative

Moreover, in West Slavic languages (e.g., Czech, Slovak, Polish), imperfective forms of this network, both primary and secondary, serve as bases to which the generic morpheme *-va-* is applied, productively deriving specifically generic forms (Filip & Carlson, 1997; Filip, 2026). This could be illustrated by the following example from Czech: *dopřepisová***va***t* [COMP.ITER.write.IPFV.**GEN**.INF] 'to tend to finish rewriting an and off, regularly, often . . . ' Such networks of derivationally related verbs share the same root/lexeme, and exhibit numerous lexical idiosyncracies and accidental paradigm gaps (e.g., not all Slavic verb prefixes apply to all verbs, the imperfectivizing suffix does not apply to all perfective verbs). Slavic verb prefixes are embedded in such networks of derivationally related (im)perfective verbs sharing the same root/lexeme, consisting of related derivational patterns. The complexity of such relations and the often unpredictable nature of their lexical semantic contributions make implausible the claim that perfectivity is predictably linked to verb prefixes in Slavic languages, and by the same token the claim that Slavic verb prefixes are grammatical (inflectional) markers of perfectivity, as captured by the *Common Claim 1* in (19).

In support of the refutation of the *Common Claim 1*, we may also mention the prima facie fact that the presence of a prefix on a verb is neither a sufficient nor a necessary condition for that verb to be *formally perfective*, or carry the grammatical perfective feature. It is not necessary, because there are verbs with no prefixes, and which are nonetheless grammatically perfective: namely, primary perfectives, as in (1), and derived perfectives with the semelfactive suffix, as in (6). Borer (2005) suggests that primary perfective verbs present an 'idiosyncratic' case, and the absence of overt perfective marking on such 'bare' perfective verbs is akin to the absence of an overt past tense phonological realization of irregular verbs like *put* in English, or the absence of an overt plural inflection distinguishing between *fish* (sg) and *fish* (pl). Borer also proposes that they contain a null perfective prefix, while the assumption of null operators of grammatical aspect is common in syntactic theories of Slavic aspect; one might still raise the question about its empirical adequacy, as in the case of any null operators. (I will address the potential problems with the assumption of the null perfective prefix further below.)

Neither is the presence of a prefix on a verb sufficient for that verb to be perfective, because there are verbs that contain a prefix but are formally imperfective, namely secondary imperfective forms in which one or more prefixes co-occur with the imperfectivizing suffix on the same imperfective verb, as in (24) or in (10), for instance. Such data also provide a compelling argument against Slavic verb prefixes being treated as grammatical (inflectional) markers of perfective aspect, on par with say tense morphemes in English (*pace*, e.g., Borer, 2005). Let me first clarify what it means to be a grammatical marker of a given category

system, put in the simplest way. First, a marker of one member of a given category system stands in complementary distribution with markers of other members of the same category system. For instance, the English present and past tense markers are two different members of the same grammatical tense system and as such they do not co-occur on the same verb; the expression of one precludes the expression of the other:

(25) **he work-s*[PRESENT]-*ed*[PAST]

On the other hand, the English tense and progressive aspect are not members of the same grammatical category. The progressive may co-occur with any tense, may appear in environments precluding tense, and the expression of progressive aspect is semantically independent of the expression of tense in that both make independent contributions to the meaning of sentences.

(26) PROG construction:

| | |
|---|---|
| *be* [INF] | *working* [V-ING] |
| *he is* [PRES] | *working* [V-ING] |
| *he was* [PAST] | *working* [V-ING] |
| *he will be* [FUT] | *working* [V-ING] |

If we accept that the present and past tense morphemes in English are members of the same category of tense, following this standard reasoning, then we should accept that the same style of reasoning when applied to Slavic verb prefixes and the imperfectivizing suffix leads us to conclude that they *cannot* be both two different members/markers of the same grammatical category of verb aspect. If the imperfectivizing suffix marks the imperfective aspect of a verb, as all agree, and given that it has at least some properties that make it come close to a grammatical marker of IPFV aspect (but see the caveats above), then its co-occurrence with one or more prefixes on the same verb would seem to indicate that verb prefixes cannot mark perfective aspect, i.e., be two different markers of the same category of grammatical aspect. If they were two different markers/members of grammatical aspect, then they should be in complementary distribution. While this would be the most straightforward and standard view of what it means to be a member of a given grammatical category, in syntactic theories of Slavic aspect, however, there have been various proposals regarding the architecture of derivationally complex Slavic verbs, which presuppose that Slavic verb prefixes and the imperfectivizing suffix on the same verb spell out two different aspectual heads that occur at two distinct syntactic positions in the analyses of morphologically complex Slavic verbs. While they may adhere to the relevant theory-internal assumptions, one might at least raise the question about the empirical adequacy of such syntactic analyses, and about their alternative views of the way in which morphological systems of natural language work.

That Slavic verb prefixes are not elements of grammatical (inflectional) verb paradigms, unlike core markers of grammatical categories of the TMA system (e.g., past and present tense suffixes in English or tense-aspect suffixes in French) is also evident in the fact that Slavic verb prefixation often induces not only change in aspect, but also idiosyncratic lexical meaning changes, which are not compositional and transparent, as well as changes in argument structure. As is well-known (e.g., Forsyth, 1970, i.a.), there is an affinity between prefixation and transitivity. Slavic verb prefixes, when applied to primary (underived, simplex) imperfective verbs that are inherently intransitive often derive prefixed perfective verbs that are obligatorily transitive, as in (23a) and (23b), and in this respect, they pattern with prefixes in German, for instance. Morphology that induces lexical meaning changes and argument structure changes is taken to be derivational, rather than inflectional. Grammatical (inflectional) markers of aspect are not argument changing, and neither are they not compositional and transparent.

https://doi.org/10.3390/languages11010005

The challenges and puzzles posed by the unpredictability of different meanings that one and the same prefix form can assume when attached to different verbs can be illustrated with the different meanings/uses of the prefix *na-* in the following Czech examples:

(27) a. *Pekař pekl*$^{\text{IPFV}}$ *housky. Byly dvě. / Bylo jich hodně.* Czech
baker baked rolls. Were two. / Were they many.
'The baker baked / was baking rolls. There were two of them./ There were many of them.'

b. *Pekař* ***napekl***$^{\text{PFV}}$ *housky. Byly ?dvě. / Bylo jich hodně.*
baker **na.**baked rolls. Were ?two. / Were they many.
'The baker baked many / a lot of / a (large) quantity of rolls. There were ?two of them / There were many of them.'

(28) a. *Tomáš psal*$^{\text{IPFV}}$ *domácí úkoly. Byly dva.* Czech
Thomas wrote homework assignments. Were two.
'Thomas wrote/was writing homework (some/the) assignments. There were two of them.'

b. *Tomáš* ***napsal***$^{\text{PFV}}$ *domácí úkoly. Byly dva.*
Thomas **na.**wrote homework assignments. Were two.
'Thomas wrote (up) /finished writing (all) the homework assignments. There were two of them.'

The prefix *na-* is here applied to two different imperfective primary verbs: *psát* (ipfv) 'to write'/'to be writing' and *péct* (ipfv) 'to bake'/'to be baking' (intended in its creation sense). They belong to the same coherent lexical semantic class of verbs that denote strictly incremental (SI) relations between eventualities and objects in the denotation of their SI Theme argument. (Intuitively, verbs denoting strictly incremental (SI) relations entail a one-to-one relation between the mereological part structure of eventualities and the part structure of objects denoted by their SI Theme argument, see Krifka, 1986, 1998; D. Dowty, 1991; Filip, 1999). Nevertheless, *na-* does not make the same semantic contribution to the two perfective verbs it derives. Such idiosyncratic behavior of verb prefixes is typical of lexical-derivational processes, rather than inflectional ones. In *napéct* (pfv) in (27b), *na-* has a vague quantificational or measure meaning of 'a lot (of)', 'many', 'a relatively large quantity (of)', as is indicated by the fact that the continuation with 'There were two' is odd, because two is a relatively small quantity (see Filip, 1992, 2000, 2005a).[12] If we remove *na-*, we obtain a corresponding imperfective sentence (27a) in which the Strictly Incremental Theme argument 'rolls' does not have this vague contextually determined measure reading, and hence there is no clash with the continuation 'There were two of them.' In contrast, *na-* in *napsat* (pfv) 'to write up', 'to finish writing' in (28b) has no vague quantity meaning, and the whole sentence has completed events of writing of some contextually determined letters in its denotation. (For an aspectual composition of perfective verbs entailing an SI relation with bare plural and mass SI Theme arguments resulting in their specific/definite interpretation, see, e.g., Filip, 2004, 2005b).

Another key property of Slavic verb prefixes that is taken to be a property of (lexical-)derivational morphology, rather than inflectional morphology (that is a part of the functional structure), is that they can be applied to verbs that are perfective, either (i) primary (3), (ii) prefixed (4), or (iii) suffixed with the semelfactive suffix (7). Attested examples for all three cases are given in the Czech example (29), where the relevant forms are highlighted in boldface, followed by a sketch of their derivational history and relations.[13]

(29) Czech
*. . . na lavičce v parku seděla slečna, on si k ní* ***přisedl****, ona si* ***odsedla****, on si* ***připosedl****, ona* ***odposedla****, on* ***připoposedl*** *. . .*
'. . . a young lady was sitting on a bench in the park, he sat down next to her, she scooched away from him, he scooched closer to her, she scooched a bit away from him, he again scooched a bit closer to her'

| | | |
|---|---|---|
| SEMELFACTIVE PFV | | PREFIXED SEMELFACTIVE PFV |
| *sednout si* (see above (6)) | → | *přisednout si* |
| sit.SEMEL.INF REFL | | DIR.sit.SEMEL.INF REFL |
| 'to sit down' | | 'to sit down next to' |
| | → | *odsednout si* |
| | | DIR.sit.SEMEL.INF REFL |
| | | 'to sit down away from' |
| ↓ | | |
| PREFIXED SEMELFACTIVE PFV | | PREFIXED SEMELFACTIVE PFV |
| *posednout si* | → | *připosednout si* |
| ATT.sit.SEMEL.INF REFL | | DIR.ATT.sit.SEMEL.INF REFL |
| 'to sit down a bit' | | 'to scooch a bit close to' |
| | → | *poposednout si* |
| | | ATT.ATT.sit.SEMEL.INF REFL |
| | | 'to scooch a bit |
| PREFIXED SEMELFACTIVE PFV | | PREFIXED SEMELFACTIVE PFV |
| *poposednout si* | → | *připoposednout si* |
| ATT.ATT.sit.SEMEL.INF REFL | | DIR.ATT.ATT.sit.SEMEL.INF REFL |
| 'to scooch a bit | | 'to scooch a bit close to' |

The stacking of two or more prefixes on a single verb is a systematic feature of Slavic verb prefixation, rather than an aberrant quirk. Bulgarian is known for sanctioning up to four or five prefixes on the same verb.

(30) *izponarazprodam* Bulgarian
COMP.DISTR.ACM.CENTRIFUGAL.PREF.GIVE.1SG
'I (will) sell out many things gradually, one (group) after another'

The combinations of prefixes on a single verb are highly constrained, and at least some allowable combinations can be predicted based on independently motivated semantic constraints (see Filip, 2003), others are lexicalized, not compositional or transparent.

It is worth noticing that the stacking of two or more prefixes on a single verb in Slavic languages is comparable to English combinations of a single verb with a stack of multiple prepositions, adverbs, and verb particles:

(31) a. *Come right back down out from up in there*! Talmy 1985
b. *We just hope she does the right thing from here on out and that this is a wake-up call for her.*

If Slavic verb prefixes were grammatical markers of perfective aspect, and so akin to tense markers in English (as, e.g., Borer, 2005 suggests), then the stacking of two or more prefixes on a single verb should not be sanctioned, because a prefix should not perfectivize an already prefixed perfective verb. Specifically, it is unclear how the occurrence of two

or more prefixes on one verb could be accommodated in syntactic analyses of aspect that treat prefixes as the phonological spell out of a perfective aspect head/feature in a syntactic structure with one and only one aspect functional head (see, e.g., Schoorlemmer, 1995; Borer, 2005, i.a.), unless one is ready to accept some ad hoc solutions like two or more prefixes forming a unit spelling out one aspect head/feature, for instance.

In summary, analyses of Slavic verb prefixes that in one way or another are underpinned by the broad claims in (19) and/or (20) are empirically speaking implausible. Based on the above observations, and pre-theoretically speaking, the basic properties of the Slavic verb prefixes that need to be accounted for by any adequate theory of Slavic aspect can be summed up as follows:

(32) Slavic verb prefixes

- Apply to imperfective *and* perfective verbs, whereby the latter can be morphologically simplex (primary, underived) (as in (3) and (4)) or morphologically complex; one or more prefixes may occur on one and the same perfective verb (as in (5) and (7)) or co-occur with the imperfectivizing suffix on one and the same secondary imperfective verb (as in (24));
- Derive new prefixed perfective verbs that differ in their lexical meaning, and possibly also argument structure, from their derivational base;
- Do not generate aspectual pairs, but rather are a part of networks of derivationally related perfective and imperfective forms sharing one common root/lexeme.

Generally, morphology that induces the changes in the kind that Slavic verb prefixes do is classified as (lexical-)derivational, rather than inflectional. Lexical-derivational properties of Slavic verb prefixes lead to the following conclusion regarding their relation to perfectivity:

- Slavic verb prefixes are not grammatical markers of perfective aspect, i.e., comparable to inflectional morphology of the core markers of the TMA system. It makes no sense to speak of 'perfective prefixes', or 'prefixes marking perfective aspect' (on par with, e.g., bona fide grammatical tense markers). A prefixed verb's grammatical property of perfectivity is not a property of its prefix, but rather of its fully formed verb stem (without tense morphology), and specified in its lexical entry.
- While Slavic verb prefixes have a perfectivizing function, there are no 'lexically empty' verb prefixes that *only* have a perfectivizing function, without introducing any other meaning modifications beyond perfective aspect change.

### *5.2. Semantic Properties of Slavic Verb Prefixes: Some Wrong Attitudes*

On one prevalent view, the uniform, invariable semantics for perfective and imperfective forms in natural language is reduced to the telic and atelic semantic properties, respectively. The telic/atelic distinction is the main distinction among aspectual classes (see Filip, 2017 for an overview and references):

(33) Perfective forms uniformly denote telic predicates.
Imperfective forms uniformly denote atelic predicates.

In contemporary linguistics, this widespread view can be traced to Mourelatos (1978, 1981). He observes that aspectual classes, which were developed in the philosophy of language and mind, also influenced by the Aristotelian tradition (e.g., Vendler, 1957), are reflected not only at the lexical level, but also at the morphological and syntactic level in languages with grammatical perfective/imperfective aspect (e.g., French, Greek, and Russian, see Garey, 1957, i.a.). This leads Mourelatos to enriching Aristotelian aspectual classes with insights from aspect studies couched in traditional philology and structuralism. On the positive

side, Mourelatos (1978, 1981) extends the agent-oriented Aristotelian classes (like Vendler's) to an agentivity neutral tripartite classification into STATES, PROCESSES and EVENTS, which is now widely used in event semantics. His event/process distinction corresponds to the telic/atelic distinction of Garey (1957) (Mourelatos, 1981: fn. 37). The correspondences between Mourelatos's aspectual classes and those of Vendler and Garey are given below.

(34) Aspectual classes

| STATE | PROCESS | EVENT | |
|---|---|---|---|
| | | | Mourelatos (1978) |
| state | activity | accomplishment & achievement | Vendler (1957) |
| | ATELIC | TELIC | Garey (1957) |

On the negative side, however, Mourelatos proposed the problematic one-to-one form-meaning correspondences 'perfective ≈ telic' and 'imperfective ≈ atelic', which he illustrates with Russian data, among others:

(35) Adapted from Mourelatos (1978, 1981): PFV/IPFV and (a)telicity in Russian

| grammatical aspect | IMPERFECTIVE | | PERFECTIVE |
|---|---|---|---|
| aspectual class | ATELIC | | TELIC |
| | activity/process | | achievement/event |
| Russian | *lečit'* (root V) | → | ***vy****lečit'* (prefixed V) |
| | 'to treat' | | 'to cure' |

The simple correspondences 'perfective ≈ telic' and 'imperfective ≈ atelic' inform a number of contemporary analyses of Slavic aspect, which in a nutshell amount to the following assumptions:

(36) *Slavic (im)perfectivity and (a)telicity*

i. Imperfective forms uniformly denote atelic predicates.
ii. Perfective forms uniformly denote telic predicates.
iii. Perfective forms are derived from simplex (primary) imperfectives by means of verb prefixes, complying with the following morphological pattern and its semantic interpretation rule:

*The morphological rule*: $[V_{root}]_{\mathbf{ipvf}} > [\text{PREFIX}.V_{\text{ROOT}}]_{\mathbf{pfv}}$ (= (17)).
*The semantic interpretation rule*: Verb prefixes instantiate the semantic function posited for the interpretation of perfective aspect that is uniformly analyzed in terms of telicity.

On this view *any* Slavic verb prefix takes as input an atelic (imperfective) predicate and yields a telic (perfective) predicate as output, be it the Russian *vy-* in (35), *na-* in the Czech examples in (28b) and (27b) or in the Russian example (22), or any other prefix.[14]

One way of implementing the relevant semantic interpretation rule, as stated in (36)/(iii), is to treat Slavic verb prefixes as a whole class as telicity modifiers that express a function that maps atelic predicates onto telic predicates:

(37) Hypothesis: Slavic verb prefixes uniformly function as telicity modifiers. For any verb prefix $\alpha$,
$[\![\alpha]\!] \Rightarrow \lambda P \lambda e[\text{ATELIC}(P)(e)] \rightarrow \lambda P \lambda e[\text{TELIC}(P)(e)]$.
Assumption: In compliance with (36)/(iii).
Whereby

- ATELIC(P): a set of non-culminated eventualities,
- TELIC(P): a set of culminated events.

(Caveat: This hypothesis will first be revised and then rejected.)

https://doi.org/10.3390/languages11010005

In approaches to Slavic aspect that endorse or are compatible with the above generalizations, there seems to be an understanding that Slavic perfective verbs uniformly entail culmination requirement with respect to some terminal point, i.e., denote only events that have culminated, completed events in their denotation, and Slavic verb prefixes uniformly contribute this entailment to perfective verbs. All agree that this intuition is tied in one way or another to telicity. It may be directly represented in terms of the telic(ity) feature (e.g., Kratzer, 2004), but other features are also common, including completion (e.g., Slabakova, 1997, 2005; Zucchi, 1999; Kratzer, 2004).[15] For instance, Zucchi (1999) claims that Slavic (Russian) verb prefixes, when applied to primary imperfective stems, which denote complete/incomplete events, yield prefixed perfective stems denoting only complete (or culminated) events, and hence instantiate the function that is posited by Parsons (1990) for the interpretation of perfectivity in English. The uniform denotation of Slavic perfective verbs is also taken to amount to that of accomplishment and/or achievement predicates, on their interpretation, common since (D. R. Dowty, 1979), in terms of the culmination or completion requirement (e.g., Mourelatos, 1978, 1981; Kratzer, 2004). Among other features that have been used to capture the same intuition about the culmination requirement of Slavic perfective verbs are quantization (Krifka, 1992), quantity(-telicity) (Borer, 2005), result (see, e.g., Arsenijević, 2006), albeit comprising also meanings of perfective verbs that are not resultative in the strict sense of the word.

The generalizations in (36) work in tandem with the claim that Slavic verb prefixes are grammatical (inflectional) markers of perfectivity (see (19) above), but they are also compatible with Slavic verb prefixes being analyzed as derivational, rather than inflectional (grammatical), morphology.[16] Most importantly, any analysis of Slavic verb prefixes and perfectivity that explicitly endorses or implicitly presupposes some version of (36) faces possibly insurmountable challenges posed by (i) prefixless perfective verbs (as in (4)), (ii) prefixed secondary imperfective verbs (as in (10)), and (iii) verb prefixes applying to verb stems that are already perfective (as in (4), (5) or (29)).

To take the last data point, in (4) and (5), Slavic verb prefixes may have as their input and also output perfective verbs that entail culmination, i.e., both their input and output only denote sets of culminated EVENTS and so both their input and output are telic. Semantically speaking, in this case, the application of a prefix to a perfective verb amounts to an identity operation that returns the same telic value as its input. This is a systematic feature of Slavic verb prefixation, not some deviation to be accounted for by exceptional rules, but it is a feature, which is, however, often downplayed, or unexpected from the point of view of (36). In order to accommodate such data, we must revise both the morphological input condition on the application of Slavic verb prefixes in (36)/(iii) as well as the condition on their semantic input in the hypothesis given in (37), while keeping their output condition that they uniformly yield telic predicates:

(38) Hypothesis (*Revision 1* of (37)):
Slavic verb prefixes uniformly function as telicity modifiers. For any verb prefix $\alpha$,
$[\![\alpha]\!] \Rightarrow \lambda P \lambda e[\mathsf{ATELIC}(P)(e) \vee \mathsf{TELIC}(P)(e)] \rightarrow \lambda P \lambda e[\mathsf{TELIC}(P)(e)]$.
Not in compliance with (36)/(iii).
Whereby

- ATELIC(P): a set of non-culminated eventualities,
- TELIC(P): a set of culminated events.

(Caveat: This hypothesis will be revised and rejected.)

It is not difficult to formulate some ad hoc and relatively easy fixes in the face of the apparently exceptional behavior of Slavic verb prefixes that do not comply with the generalizations in (36) and (37). However, such tweaks ultimately fail to account for the whole

range of Slavic prefixation data, and also to address the fundamental limitations of the simple correspondences 'perfective ≈ telic' and 'imperfective ≈ atelic', as in (33) and (36), and the related assumption that Slavic verb prefixes are perfectivity-telicity markers.

One fundamental limitation of these one-to-one correspondences has to do with their prerequisite idea that (model-theoretic, semantic) notions underlying grammatical aspect (perfective/imperfective) and aspectual classes (telic/atelic) are the same. One undesirable consequence is that they render intractable even the basic phenomena in aspect studies. In what follows I will discuss three: (i) the imperfective paradox (D. R. Dowty, 1977, 1979), also known as the partitive puzzle (Bach, 1986), (ii) Slavic prefixed secondary imperfectives, and (iii) the uses of Slavic verb prefixes that are best analyzed in terms of measure functions or weak vague quantifiers (see, e.g., Filip, 1992, 1996, 2000), both of which lend themselves to a scalar analysis.

#### 5.2.1. The Imperfective Paradox or Partitive Puzzle

The imperfective paradox or the partitive puzzle is manifested in English in the invalid inference from a progressive sentence to its non-progressive counterpart:

(39) *John was crossing the street.* $\nrightarrow$ *John crossed the street.*

Sentences with the progressive operator make reference to a (non-final) STAGE, or A (PROPER) PART, of an eventuality in the denotation of the base (uninflected) predicate in its scope (see Landman, 1992 and elsewhere). In *John was crossing the street*, the base predicate CROSS THE STREET lexically specifies a CULMINATION CONDITION (in the sense of Kratzer, 2004), i.e., what must be the case if described EVENTS (all accomplishments and some achievements in Vendler's and Dowty's classification) to culminate. The culmination condition for CROSS THE STREET roughly says that events *e* in its denotation culminate with respect to the street just in case *e* is an event in which the entire breadth of the street was traversed. The progressive sentence by virtue of making reference to a (non-final) STAGE of an event *e* at some reference time *t* (a time point or an interval) presents *e* as only partially realized, in progress, at *t*, and it can be true even if its corresponding non-progressive (simple past) counterpart *John crossed the street*, which only has whole culminated EVENTS (of John crossing the street) in its denotation, is false. This is the imperfective paradox or partitive puzzle.[17] The term 'partitive puzzle', coined by (Bach, 1986), evokes the observation that progressive sentences make reference to proper parts of larger eventualities, while the term 'imperfective paradox', coined by (D. R. Dowty, 1977) presupposes a misleading assumption that imperfective and progressive aspect are functionally identical (see also further below). What needs to be motivated is that by using *John was crossing the street*, the speaker is committed to the culmination condition (which is lexically specified by the base, uninflected predicate CROSS THE STREET), but the culmination does not occur during the reference time. Asserting that John was in the process of crossing the street, the speaker may assume that John will have crossed the street at some possible (inertia) world, which is a possible continuation of the actual one (in a range of reasonably close possible worlds), but not necessarily in the actual world (D. R. Dowty, 1977, 1979). Moreover, *John was crossing the street* can also be true, even if John's crossing of the street is fatally and permanently interrupted, say by a bus hitting him, and so there is no possible continuation, no possible (inertia) world in which *John crossed the street* could be true (*pace* D. R. Dowty, 1977, 1979).

The solution to the imperfective paradox/the partitive puzzle must include the prediction when it arises, as in (39), and also when it does not, as in (40):

(40) *John was stirring the soup with a spoon.* $\rightarrow$ *John stirred the soup with a spoon.*

If a base (uninflected) predicate, e.g., STIR THE SOUP in (40), does not lexically specify a culmination condition, the inference from a progressive sentence to its non-progressive

counterpart is valid. Intuitively, if one is in the process of stirring the soup implies that some stirring of the soup has taken/took place.

In Slavic languages, the imperfective paradox/partitive puzzle is manifested in the observation that from an imperfective sentence on its contextually determined progressive interpretation, we cannot infer the corresponding perfective sentence. Consider the following Russian examples:

(41) *Čexov byl ščastliv ne togda, kogda* ***dopisal***$^{\text{PFV}}$ *'Ariadnu', a kogda*
Chekhov was happy not then when TERM.write$^{\text{PST.3SG}}$ *Ariadne* but when
***dopisyval***$^{\text{IPFV}}$ *ee*.
TERM.write.IPFV.PST.3SG her
'Chekhov was happy not when he (had) finished writing *Ariadne*, but when he was finishing writing it.'[18]

(42) *Čexov* ***dopisyval***$^{\text{IPFV}}$ *'Ariadnu'*. ↛ *Čexov* ***dopisal***$^{\text{PFV}}$ *'Ariadnu'*.
'Chekhov was finishing writing *Ariadne*.' ↛ 'Chekhov finished writing *Ariadne*.'

In contrast, and in parallel to the English example (40), the following inference from the imperfective sentence on its progressive interpretation to the corresponding perfective sentence is valid:

(43) *Saša* ***měšal***$^{\text{IPFV}}$ *sup ložkoj.* → … ***poměšal***$^{\text{PFV}}$ …
S. stir.PST.3SG soup.ACC spoon.INSTR … ATN/DEL.stir.PST.3SG…
Saša was stirring (the/some) soup with a spoon. → Saša stirred (the/some) soup with a spoon. [for a short time, in a gentle way, somewhat …]

In (42), both the imperfective predicate *dopisyval 'Ariadnu'*(ipfv) 'he was finishing/finished writing *Ariadne*' and the perfective predicate *dopisal 'Ariadnu'* (pfv) 'he finished writing *Ariadne*' lexically specify a culmination condition: namely, they specify that events *e* in their denotation culminate with respect to the object of creation *Ariadne* (Strictly Incremental Theme) just in case *e* is an event in which *Ariadne* exists in its entirety. The culmination condition states nothing about whether the described events culminated in any possible world (including the actual one), i.e., it does not require that the writing of *Ariadne* be necessarily completed. The culmination condition alone does not imply culmination. The culmination requirement is imposed by the perfective aspect of the verb in *dopisal 'Ariadnu'* (pfv) 'he finished writing *Ariadne*', given that it lexically specifies a culmination condition. Hence, the culmination requirement presupposes a culmination condition, but not vice versa. The culmination condition, which is a part of the logical representation of both the imperfective and perfective predicate in (42), can be represented as a bare predicate without grammatical aspect and tense operators:

(44) ⟦FINISH WRITING *ariadne* ⟧ ⇒ λxλe[**finish_writing**(e) ∧
Strictly_Incremental_Theme(e, ***Ariadne***) ∧ Agent(e,x) ∧ [culminate(e, ***Ariadne***) ↔
**finished_writing**(e, ***Ariadne***)] ]

The culmination requirement that is added by the perfective operator, which is introduced by a perfective verb, to a base predicate specifying a culmination condition, can be stated in the simplest way as in (45) (adapted from Zucchi, 1999):

(45) *CR(e, t, P)*
A relation between events *e*, times *t*, and properties *P* of EVENTS that specify the culmination condition with respect to which eventualities culminate at time *t*.

Denying the culmination requirement of the perfective predicate *dopisal 'Ariadnu'* (pfv) 'he finished writing *Ariadne*' by adding to it a continuation like '… but Ariadne was not completely finished, only a part of it was written' would result in contradiction, because this

perfective predicate only has culminated events in its denotation. In contrast, it is perfectly acceptable to continue the corresponding imperfective predicate *dopisyval 'Ariadnu'* (ipfv) 'he was finishing/finished writing *Ariadne*' with the negation of the culmination requirement. This is because the imperfective predicate *dopisyval 'Ariadne'* (ipfv) 'he was finishing/finished writing *Ariadne*', while entailing the culmination condition (inherent in (44)) just like its perfective counterpart, lacks the culmination requirement; it has both culminated and not culminated EVENTS of writing of *Ariadne* in its denotation.

If we assume a separation between the culmination condition, as in (44), and the culmination requirement, as in (45), the invalid inference in (42) straightforwardly follows. By using the imperfective verb (in a sentence that as a progressive reading), the speaker conveys no commitment as to whether the writing of *Ariadne* was or was not completed in some possible (inertia) world; it merely specifies a culmination condition on what it would mean for described events to culminate. The perfective operator, however, constrains the denotation of the perfective predicate to only culminated events that culminate in *Ariadne* having been completely written. By using the sentence with the perfective predicate the speaker is committed to the statement that the writing of *Ariadne* was finished.

In contrast, the valid inference in (43) follows, because the imperfective and perfective predicate do not lexically specify a culmination condition, and neither does the base predicate STIR SOUP, whose logical representations they share. Therefore, the perfective operator introduced by the perfective verb in *poměšat' sup* (pfv) 'to stir soup (a bit), gently, for a short time' does not constrain its denotation to only culminated events, i.e., it does not impose the culmination requirement. Indeed, it makes no sense to speak of culmination, completion, result and the like relative to an eventuality of stirring (the/some) soup, given that it provides no information with respect to what it should count as complete(d) or culminated. Rather, the perfective predicate denotes eventualities that terminated in the past, just like its imperfective counterpart. The only difference between the imperfective and perfective predicate is the presence of the prefix *po-* on the perfective verb *poměšat'* (pfv). It adds an attenuative or delimitative modification that roughly amounts to a low degree relative to a scale that measures time, effort, or possibly both. Which exact modificational meaning *po-* here assumes also varies with context, and native speakers may also differ in their judgments about its particular modificational nuance in a given sentence and context.

While the solution to the imperfective paradox/partitive puzzle is still outstanding, the Russian examples (41) and (42) should suffice to show that in Russian also requires that the semantics of the perfective and imperfective operators be clearly separate from the semantic properties of their input base predicates. This key insight is well-established in contemporary linguistics (see, e.g., Smith, 1991; Filip, 1993, 1999, and references therein).

Moreover, for Slavic languages, the contrast between cases like (41)/(42) in which the imperfective paradox/partitive puzzle arises and cases like (43) in which it does not shows that Slavic perfective verbs cannot be semantically analyzed in terms of a single notion like culmination, result, quantization or quantity, and other notions all of which are typically associated with telic predicates, contrary to (36). If we assume a simple form-meaning correspondence 'perfective ≈ telic', then it would remain puzzling just why the inference in (43) is valid, when it is predicted to be invalid, and just why only (42), but not (43), involves the imperfective paradox/partitive puzzle. It is telling that the imperfective paradox/partitive puzzle remains unmentioned, let alone accounted for, by approaches to aspect that subscribe to some version of the form-meaning correspondences 'perfective ≈ telic' and 'imperfective ≈ atelic', as in (33) or (36).

As we have seen, the imperfective paradox/partitive puzzle arises when a base predicate that lexically specifies a culmination condition is embedded under the progressive operator (in English), or under the imperfective operator in the logical representation of

a sentence that has a contextually determined progressive reading (in Russian). Saying that a predicate lexically specifies a culmination condition, i.e., what must be the case if described EVENTS to culminate (as Kratzer, 2004 states), but crucially without requiring culmination, comes close to the original characterization of telic verbs by Garey (1957): e.g., French telic verbs like *arriver* 'to arrive' or *noyer* 'to drown' "express an action tending towards a goal", or better towards some terminal point.[19] That is, Garey's telicity is characterized in terms of a culmination condition, not in terms of a culmination requirement, in contrast to many contemporary aspect theories that subscribe to some version of (33) or (36) (e.g., Kratzer, 2004).

Vendler (1957) might have also had something like a culmination condition, rather than the culmination requirement, in mind when he characterized accomplishment predicates, such as *run a mile*, or *write a letter* (to use his examples), as describing situations that "proceed toward a terminus which is logically necessary to their being what they are" (Vendler, 1957, p. 146). Proceeding toward a terminus does not necessarily imply reaching that terminus.[20]

This leads me to propose that what it means for a base (uninflected) predicate like CROSS THE STREET, RUN A MILE, or WRITE A LETTER to be telic or accomplishment is best characterized not in terms of the culmination requirement, contrary to what has been commonly assumed since at least (D. R. Dowty, 1979) or (Landman, 1992), and also in connection with Slavic aspect, as summed up in (36), but rather in terms of a culmination condition: namely, what must be the case if a predicate denotes events that culminate, but without requiring that they culminate at some reference time in the actual world, or any possible world (borrowing the formulation in Kratzer, 2004). In other words, the culmination condition (a sufficient condition for a telicity of a predicate) must be severed from the culmination requirement (a sufficient semantic condition for the application of the perfective operator).

This proposal is related to the debates about the denotation of base (uninflected) telic or accomplishment predicates like CROSS THE STREET (see, e.g., Zucchi, 1999). According to D. R. Dowty (1979) or Landman (1992) they only have culminated events in their denotation, while Parsons (1990) and Zucchi (1999) argue that they best be viewed as having both culminated and not culminated events in their denotation. These debates bear on the solutions to the imperfective paradox/partitive puzzle. Building on Parsons (1990) and Zucchi (1999), I propose that base (uninflected) telic/accomplishment predicates like CROSS THE STREET have both culminated and non-culminated events in their denotation, i.e., they lack the culmination requirement, but they lexically specify a culmination condition, which makes them telic in the original sense of (Garey, 1957) or accomplishments in the sense of (Vendler, 1957). This leads me to the following proposal concerning telicity:

(46) For a predicate to be telic, it suffices that it lexically specifies a culmination condition, but not the culmination requirement.

On this view, the culmination condition states what must be the case if a described event culminates. For example, the culmination condition for (a bare uninflected predicate) *eat an apple* states that events in its denotation culminate with respect to an apple just in case they are events in which that apple is completely eaten. The culmination implication is the requirement that a described event culminate. For instance, it is imposed if a predicate that lexically specifies a culmination condition (e.g., *eat an apple*) is realized in the past tense sentence in English. For example, *John ate an apple* only has culminated events in its denotation. Telicity is then a second-order property of base predicates that lexically specify a culmination condition, but do not enforce the culmination requirement.[21] Telic predicates that lexically specify a culmination condition have both culminated and non-culminated events in their denotation. The progressive operator (as in English) restricts

their interpretation to proper (not final) stages of events in their denotation, i.e., to events that do not culminate in the actual world, and possibly in no possible worlds. The perfective operator restricts their denotation to culminated events.

Generally, in order to account for the imperfective paradox/partitive puzzle, we cannot reduce the meaning of grammatical aspect operators (perfective, imperfective, progressive) to the same (model-theoretic, semantic) notions that are used to characterize the telic and atelic properties of base predicates to which grammatical aspect operators are applied. In other words, the simple correspondences 'perfective ≈ telic' and 'imperfective ≈ atelic' on which the generalizations in (36) are predicated must be rejected.

Using our Russian examples in (42) and (43), the interaction of (im)perfective aspect (grammatical aspect) and telicity (aspectual classes) can be illustrated by the table given below:[22]

(47) Russian: PFV/IPFV and TELICITY (= culmination condition [+*CC*])

| IMPERFECTIVE | PERFECTIVE |
|---|---|
| [+*CC*] TELIC | [+*CC*] TELIC<br>[+*CR*] |
| *on dopisyval 'Ariadnu'*<br>'he was finishing writing *A*.'<br>'he finished writing *A*.' | *on dopisal 'Ariadnu'*<br>'he finished writing *A*.' |
| [− − −*CC*] ATELIC | [±*CC*] NON-TELIC |
| *měšat' sup*<br>'he was stirring (the/some) soup'<br>'he stirred (the/some) soup' | *poměšat' sup*<br>'he stirred (the/some) soup,<br>a bit, gently' |

For a predicate to be telic means that it entails a culmination condition ([+*CC*]), but not necessarily also the culmination requirement ([+*CR*]). The culmination requirement ([+*CR*]) is only defined for predicates that entail a culmination condition ([+*CC*]), and when the perfective operator applies to them. Hence, the culmination requirement presupposes a culmination condition, but not vice versa. Predicates that do not specify a culmination condition ([+*CC*]) are either atelic ([− − −*CC*]) (states like 'to know', 'to believe' and processes like 'to sleep', 'to stir') or unmarked with respect to telicity ([±*CC*]). The latter include Slavic imperfective verbs that denote (strictly) incremental relations (Filip, 1993, 1999) on their own taken as lexical items, such as the Russian *pisat'* (ipfv) 'to write', 'to be writing', and also, for instance, Slavic perfective verbs containing prefixes that are used with a vague measure or quantificational meaning like the traditionally labeled attenuative or delimitative use of *po-*, as in the Russian perfective verb *poměšat'* 'to stir/mix a bit, gently, for a short time'. Such Slavic perfective verbs fail to entail a culmination condition, i.e., they fail to be telic (in the sense characterized here), and also quantized. However, neither are they clearly atelic, according to the commonly accepted tests for atelicity. By virtue of being perfective, they are odd with durative adverbials (e.g., *desat' minut* 'for ten minutes'). But, unlike many perfective verbs, notably those that entail both the culmination condition ([+*CC*]) and requirement ([+*CR*]), they are not acceptable with time-span adverbials (e.g., *za čas* 'in an hour' used to measure the extent of single eventualities in their denotation (rather than the time elapsing before their onset) (see Filip, 1992, 2000, 2005a).

#### 5.2.2. Slavic Telicity and Perfectivity Is Not Predictably Linked to Prefixes

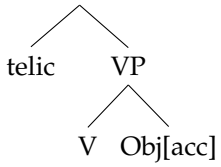
Having rejected the simple correspondences 'perfective ≈ telic' and 'imperfective ≈ atelic' which underpin many contemporary aspect studies, I will address, and reject, the claim that Slavic telicity, and perfectivity, is predictably linked to verb prefixes, contrary to the general tenets in (33), (36)/(i) and (ii), and (37). Hence, Slavic verb prefixes do not

uniformly instantiate the function posited for the interpretation of perfectivity, which is reduced to a variety of notions (such as completion, culmination, and result) that are taken to fall under the wide umbrella of telicity.

For concreteness' sake, the arguments against this view will be structured as critical responses to Kratzer (2004) and Borer (2005). The reason for this is that they present in a lucid and concise way some of the fundamental assumptions behind many current syntactic approaches to Slavic aspect which adhere in one way or another to the overarching one-to-one correspondences 'perfective : imperfective = telic : atelic' (see (36) and (37) above). In contrast, the architecture of Slavic morphologically complex verbs are endorsed here.

The main goal of Kratzer (2004) is to motivate the connection between a semantic (telic) property of VPs and (accusative) case morphology on direct objects, drawing on Finnish, German and Russian data. In Finnish and German, this connection relies on the claim that the head that licenses accusative on direct objects has the semantics of a telic operator:

(48) [telic]: $\lambda R \lambda x \lambda e[R(x)(e) \& \exists f[\text{measure}(f) \& \forall x' [x' \leq f(x) \rightarrow \exists e'[e' \leq e \& R(x')(e')]]]]$




The *[telic]* operator is defined in terms of a function *f*, a cognitively salient function mapping the referents of certain objects into concrete or abstract 'measuring rods' with respect to which what it means for that event to have culminated is determined; this corresponds to the defining culmination requirement of a telic predicate. There is a homomorphism between parts of such 'measuring rods' and parts of culminated events, which comes close to mapping to subevents, MSE($\theta$), in Krifka (1998, (46)): Iff $\forall x,y \in U_P \forall e \in U_E[\theta(x, e) \wedge y \prec_P x \rightarrow \exists e'[e' \prec_E e \wedge \theta(y,e')]]$.

For Russian, in contrast to German and Finnish, Kratzer (2004) argues that "the telicity of Russian verbs is predictably linked to a set of prefixes" (Kratzer, 2004, p. 404), rather than to the accusative case, and "[i]f telicity is linked to prefixes in Russian, verb stems with those prefixes do not merely determine a culmination condition; they imply culmination" (Kratzer, 2004, p. 404, fn. 26).

These claims are embedded within a larger hypothesis about verb stems in natural languages:

(49) Hypothesis (Kratzer, 2004, p. 395): *Verb stems and telicity*.
In natural languages, there may be no verb stems that merely characterize a culmination condition without already implying culmination.

*There are three kinds of predicates*:

1. Predicates that are *inherently telic*, i.e., specify both the culmination condition and requirement. Examples: Achievement verbs like *win* and *lose*.
2. Predicates that are *inherently atelic* (i.e., lack both the culmination condition and requirement), but which can behave variably as telic or atelic depending on the lexical material or general cognitive principles specified outside of them. Examples: *read, eat, bake, iron*.[23]
3. Predicates that are *inherently atelic*, and exhibit no variable telic/atelic behavior. Examples: stative verbs like *love, admire, hate*, and process verbs like *enjoy*.

*Corollary*: Russian prefixed verb stems determine a culmination condition and imply culmination. The [telic] inflectional head feature is predictably linked to (a set of)

prefixes. (i.e., Russian prefixes instantiate the same function that is posited for the interpretation of the perfective operator in Slavic languages, and also, e.g., in English, see Parsons, 1990.)

In Kratzer (2004), telic predicates necessarily specify both the culmination condition and require culmination, i.e., have the semantics of perfectivity, or introduce a perfective operator. From this it follows, as Kratzer also states, that natural languages should only have two kinds of eventive verb stems: telic ones, which already entail culmination and its prerequisite culmination condition, on the one hand, and atelic ones, on the other hand, which lack both. Telic stems include the stems for verbs that denote achievements, such as *win, lose*. Culmination conditions for verbs built from atelic stems are specified by the lexical material outside of such atelic stems, and could also be inferred using general cognitive principles rather than relying on knowledge of the lexical meanings of the atelic stems.

It is not entirely clear whether Kratzer's claim about Russian prefixes in (49) regards all prefixes or only a subset. If it is a claim about all Russian verb prefixes, then it is false. If it covers only a subset of Russian prefixes, or better some of their uses, then it raises considerable problems for her analysis of Russian verb prefixation, and specifically, as Kratzer observes, for Russian prefixed verb stems that occur in the scope of the imperfectivizing suffix on the same verb.

In the following, I will show that such problems can be easily avoided if the specification of a culmination condition is severed from the culmination requirement, contrary to Kratzer's hypothesis (see (49)). This will also add another argument in support of the view that specifying a culmination condition, without culmination implication, is sufficient for a predicate to be telic, as proposed here in (46). On the telicity view defended here, the culmination requirement is added by the perfective operator on 'top of' telic predicates specifying a culmination condition. In short, this amounts to severing the contribution of Russian verb prefixes from the semantics of perfective aspect, and to the claim that Russian verb prefixes do not instantiate the function for the interpretation of perfective aspect, contrary to Kratzer's hypothesis in (49) and also (36), while in what follows I will draw on Russian data, the same arguments can be easily made using analogous examples from other Slavic languages.

Let me start with the observations that there are Russian prefixes building verb stems that neither determine a culmination condition nor imply culmination, contrary to Kratzer's hypothesis (49). Hence, such prefixes do not qualify as 'telic prefixes' (i.e., instantiations of the *[telic]* functional head) and prefixed verb stems they form fail to denote telic predicates. A good example is the use of the Russian prefix *po-* in the perfective verb *pomĕšat'* (pfv) 'to stir/mix a bit, gently, somewhat, for a short time', as in (43) above. It is repeated below for convenience:

(50) *Saša pomĕšal*$^{\text{PFV}}$ *sup ložkoj*.
Saša ATN/DEL.stir.PST.3SG soup.ACC spoon.INSTR
'Saša stirred (some/the) soup with a spoon [for a short time, in a gentle way, somewhat, 'with a little effort', . . . ]'

Here, the contribution of the prefix *po-* to the perfective verb is traditionally characterized in terms of the attenuative (glossed as ATN) or delimitative (glossed as DEL) Aktionsart. These are also the two common uses of its cognates with the same form *po-* in other Slavic languages. ('Aktionsart' is used in the sense as in traditional philology and structuralism.)

The attenuative/delimitative use of *po-* gives rise to the quantization (telicity) puzzle posed by perfective verbs that contain it, in Russian and other Slavic languages (Filip, 2000, also Filip, 1992, 1996, 2005a, and elsewhere). Intuitively, the reason for it is that a predicate that approximately means 'to stir/mix (the/some) soup somewhat' lexically does not specify what it must be the case if events described by it culminate; it does not specify

any terminal point, result, upper bound on the relevant property scale. Hence, the issue of culmination is moot. Specifically, the puzzle is as follows: The prefixed verb *poměšat'* (pfv) 'to stir/mix a bit, gently, somewhat, for a short time' is grammatically perfective, as it passes most of the standard tests for perfectivity: e.g., (i) in the present tense, it has a future time reference; (ii) it lacks reference to 'ongoing' stages of eventualities in its denotation (i.e., no availability of a progressive reading); (iii) it is excluded as a complement of the future auxiliary and phasal verbs such as 'to begin', 'to finish', 'to continue'. Nevertheless, despite being grammatically perfective, it fails to imply culmination (*pace* Kratzer, 2004, i.a.), and it also fails to be quantized (*pace* Krifka, 1986, 1989, 1992, 1998).

Generally, Russian perfective prefixed verbs that imply culmination cannot be validly inferred from their imperfective counterparts on their progressive reading, as we have seen above in (41) and (42), which, as also observed above, falls under the imperfective paradox/partitive puzzle (Bach, 1986; D. R. Dowty, 1977, 1979). Now, if the prefix *po-* in (50) were a 'telic prefix' in Kratzer's sense, contributing the culmination requirement, then the inference in (43) should be invalid. But it is valid. Intuitively, if you are in the process of stirring some soup a bit, gently, which can be expressed by the imperfective unprefixed verb *měšat'* (ipfv) on its progressive interpretation 'to be stirring/mixing', you have already done some stirring of that soup, and the latter can be felicitously described by its perfective prefixed counterpart *poměšat'* (pfv) 'to stir/mix somewhat, in a gentle way, for a short time', 'with a little effort'.

Moreover, the perfective prefixed verb *poměšat'* fails to be quantized, contrary to Krifka (1992) who argues that Slavic perfective verbs uniformly denote quantized predicates, which also makes them telic:

(51) $\text{QUANTIZED}(P) =_{\text{def}} \forall e, e'[P(e) \wedge e' < e \rightarrow \neg P(e')]$
Krifka (1986), and elsewhere

The perfective prefixed verb *poměšat'* 'to stir/mix (some/the) soup a bit, gently, for a short time, 'with a little effort', . . . ' fails to be quantized, because if *e* is an eventuality described by this verb, then *e* will have a proper part *e'* which will also fall under the description of this same verb.

There are many prefixed perfective verbs like *poměšat'* (pfv) 'to stir/mix a bit, gently, somewhat, for a short time, 'with a little effort', . . . ' in Russian and other Slavic languages, which fail to entail culmination and fail to be quantized. One large class of such prefixed perfective verbs are formed with prefixes that have a vague measurement or quantificational meaning. For instance, from the primary imperfective verb *gret'* 'to (be) heat(ing)' we can derive with the prefix *pere-* the perfective verb *peregret'* 'to overheat', with *na- nagret'* (pfv) 'to warm up somewhat (possibly to reach some desired temperature), *pogret'* (pfv) 'to warm (up) for a short time' (without necessarily reaching some particular temperature).

Their existence is unexpected from the point of view of any theory of Slavic aspect that endorses some version of (36), which take for granted that all Slavic prefixes uniformly instantiate the 'telic' function for the interpretation of perfective aspect, variously understood in terms of the culmination entailment, completion, result, quantization, and the like. This implies that Slavic verb prefixes map atelic predicates onto telic predicates, which is also the idea behind Kratzer's hypothesis in (49).

However, notice that the Russian prefix *po-*, as in *poměšat'* (pfv) 'to stir/mix a bit, gently, somewhat, for a short time', maps atelic predicates onto predicates that are not telic. *Po-* is added to the stem of the primary (simplex, underived) imperfective *měšat'* 'to (be) stir(ring)'/'to (be) mix(ing)', which is atelic, i.e., it lacks both the culmination condition and requirement, and yields prefixed perfective stems that also fail to determine the culmination requirement.

https://doi.org/10.3390/languages11010005

Such data require another revision of the original hypothesis concerning the input and output conditions of Slavic verb prefixes given in (37), also assumed by Kratzer (2004), namely *Hypothesis 3* given in (52), which is the weakest statement with no predictive power. The original hypothesis and its two revisions are given below:

(52) *Hypothesis 1* [= (37)]:
Slavic verb prefixes uniformly function as telicity modifiers. For any verb prefix $\alpha$,
$[\![\alpha]\!] \Rightarrow \lambda P \lambda e[\mathsf{ATELIC(P)(e)}] \rightarrow \lambda P \lambda e[\mathsf{TELIC(P)(e)}]$.
Assumption: In compliance with (36)/(iii).

*Hypothesis 2* [the first revision of (37), given in (38)]:
Slavic verb prefixes uniformly function as telicity modifiers. For any verb prefix $\alpha$,
$[\![\alpha]\!] \Rightarrow \lambda P \lambda e[\mathsf{ATELIC(P)(e)} \vee \mathsf{TELIC(P)(e)}] \rightarrow \lambda P \lambda e[\mathsf{TELIC(P)(e)}]$.
Not in compliance with (36)/(iii).

*Hypothesis 3* [the second revision of (37)]:
For any Slavic verb prefix $\alpha$,
$[\![\alpha]\!] \Rightarrow \lambda P \lambda e[\mathsf{ATELIC(P)(e)} \vee \mathsf{TELIC(P)(e)}] \rightarrow \lambda P \lambda e[\mathsf{ATELIC(P)(e)} \vee \mathsf{TELIC(P)(e)}]$.
Not in compliance with (36)/(iii).

Whereby

- ATELIC(P): a set of non-culminated eventualities.
- TELIC(P): a set of culminated events.

In summary, if telicity is understood in terms of specifying the culmination condition and requiring culmination, as in, e.g., Kratzer (2004), then it does not provide the right way of thinking about the semantics of Russian and Slavic, verb prefixes.

Moving on to prefixed verb stems, which, according to Kratzer's hypothesis (49), determine the culmination implication, it turns out that they lead to the following apparent puzzle when they co-occur with the imperfectivizing suffix on the same prefixed secondary imperfective verb. A case in point is *dopisyvat'* (ipfv) 'to (be) finish(ing) writing', as in (41), (42), and (47). According to Kratzer, its prefixed verb stem implies culmination due to the prefix *do-*, and so has the semantics of telicity/perfectivity, but the imperfectivizing suffix marks the fully formed verb as imperfective, and so makes it atelic, which is characterized as lacking the culmination implication. And yet *do-* and the imperfectivizing suffix are semantically compatible.

Taking a closer look at *dopisyvat'* (ipfv) 'to (be) finish(ing) writing', the terminative meaning component of the prefix *do-* is lexically associated with the maximal upper bound closed scale, which qualifies *do-* as a 'telic prefix' (in the sense of Kratzer) par excellence. It is with respect to this maximal upper bound that the culmination condition of the prefixed stem is specified, and given that the culmination condition necessarily comes together with the culmination requirement, according to Kratzer's hypothesis in (49), this 'telic prefix' also introduces the culmination requirement. Put differently, *do-*, a 'telic prefix' in Kratzer's terms, instantiates the function for the interpretation of perfectivity. However, when the imperfectivizing suffix is applied to it, it derives a verb that is imperfective and therefore should have no culmination entailment, and no prerequisite culmination condition. There is a large class of prefixed secondary imperfectives in Russian and also in other Slavic languages (see Section 3 above) that exhibit this apparent clash.

In order to resolve it, Kratzer (2004) proposes that the Russian imperfectivizing suffix, "which can derive 'in progress' readings for telic verbs" (Kratzer, 2004, p. 405), "could 'neutralize' the culmination implication of a predicate with a telic prefix when it takes scope over it" (ibid). Following Filip (2000), Kratzer suggests that Russian verb prefixes are

of derivational nature, while the Russian imperfectivizing suffix is a piece of inflectional morphology. "This automatically places the imperfective operator in a higher position. Higher imperfective operators, then, can take telic predicates and map them into predicates that closely mimic the behavior of atelic ones" Kratzer (2004, p. 405). Specifically, the Slavic imperfective operator is suggested to have the semantics that approximates that of the English progressive operator: namely, it has the effect of presenting situations as being in progress, whereby the culmination requirement (imposed by the 'telic prefix') is satisfied in some reasonably close possible world, but not necessarily in the actual world.

However, this attempt at fixing the apparent clash between the alleged atelicizing imperfectivizing suffix and the 'telic prefix' in its scope is not feasible. It poses at least three problems:

(i) The Russian imperfective operator carried by the imperfectivizing suffix cannot be equated with the progressive operator, as it is, e.g., instantiated by the progressive construction in English.
(ii) The imperfective and progressive operators cannot be analyzed as uniformly yielding atelic predicates (or homogeneous predicates on some accounts).
(iii) The meaning of a 'telic prefix' (in Kratzer's sense) must be accessible to the combinatorial rules by which the meaning of a sentence is derived; it cannot be 'neutralized' in the scope of the imperfective operator. This is necessary in order to motivate its interaction with quantifiers, modifiers and other semantic operators when the meaning of a sentence is calculated.

Let me address these three problems in turn. First, the Russian imperfective operator does not have the semantics of the progressive operator. Generally, the imperfective operator has a wider range of interpretations than the progressive operator. Specifically, Slavic imperfective verbs, including both primary imperfectives and secondary imperfectives (that are marked with the imperfectivizing suffix) cover the whole semantic domain of imperfectivity, both its episodic and generic semantic subdomains. In this respect, they behave like imperfective verbs in other languages with the perfective/imperfective grammatical distinction (e.g., Romance or Modern Greek, for instance, see Comrie, 1976). The progressive interpretation is just one among other possible contextually determined readings of (primary and secondary) imperfective forms. In Slavic linguistics, there are many debates concerning the kind and number of these readings, and the nature of the invariant core meaning of (primary and secondary) imperfective verbs, if any. In any case, progressivity is not their core, default, or preferred, let alone only reading.

Slavic imperfectives also appear in contexts where they are substitutable salva veritate with their corresponding perfective counterparts. They may be used to describe events that are known to have been completed, culminated, or ended in the past, in the actual world. The following simple dialog illustrates this point:

(53) A: Did you pay the bills?
B: *Da, ja platil*$^{\text{IPFV}}$ *sčeta*. Russian
yes, I pay.PST.3SG bills
'Yes, I paid the bills.'
B': *Da, ja oplatil*$^{\text{PFV}}$ *sčeta*.
yes, I PREF.pay.PST.3SG bills
'Yes, I paid the bills.'

The progressive operator does not sanction such a reading. For instance, the English past progressive sentence *John was paying the bills* cannot be used to convey the inference that John actually did pay the bills in the past, and be substituted salva veritate with the corresponding non-progressive sentence *John paid the bills*.

https://doi.org/10.3390/languages11010005

Second, generally progressivity and imperfectivity cannot be reduced to atelicity, which is characterized in terms of homogeneity, cumulativity, and the like. The output of the progressive operator and the imperfective operator does not amount to the semantics of atelic predicates. One among other reasons for this has already been discussed above: namely, the imperfective paradox/partitive puzzle. It is posed by progressive sentences with telic base predicates, as witnessed by the invalid inference in (39), but not by progressive sentences with atelic base predicates, as in (40) (see also D. R. Dowty, 1977, 1979). If progressive sentences were uniformly atelic, i.e., if the progressive operator uniformly mapped telic predicates onto predicates behaving like atelic predicates (Kratzer, 2004, p. 405), then the inference from progressive sentences with telic base predicates to their corresponding non-progressive sentences should be valid, contrary to fact (see (39)).

Parallel observations about the imperfective paradox/partitive puzzle were made with respect to the Russian imperfective sentences (42) and (43) on their progressive interpretation. On Kratzer's proposal, the imperfectivizing suffix in the prefixed secondary imperfective *dopisyvat'* (ipfv) 'to (be) finish(ing) writing' (in (42)) introduces a progressive-like operator with the result of 'neutralizing' the culmination requirement of the 'telic prefix' *do-* in its scope. Therefore, the *do*-prefixed secondary imperfective verb behaves like any bona fide atelic prefixless imperfective verb, i.e., like the primary imperfective verb *měšat'* (ipfv) 'to (be) stir(ring)/mix(ing)', as in (43). If so, Kratzer's proposal predicts that both the inferences in (42) and (43) should be valid. But the inference in (42) is invalid, as it exhibits the imperfective paradox/partitive puzzle. Consequently, on Kratzer's proposal, the difference between the inferences in (42) and (43) remains unaccounted for. The imperfective paradox/partitive puzzle is not addressed, and there seems to be no plausible solution to it within the framework proposed in Kratzer (2004).

Third, implicit in Kratzer's claim that the Russian imperfectivizing suffix 'neutralizes' the culmination requirement of a 'telic prefix' in its scope, and therefore also its prerequisite culmination condition (because the two cannot be separated, per Kratzer's hypothesis (49)), is the idea that at least this telic component of a prefix becomes inaccessible above the level of lexical semantics, i.e., it cannot interact with modifiers, operators, quantifiers and other constituents at the level of combinatorial (compositional) rules at which the meaning of a sentence is calculated.

This idea can be seen as related to the widespread assumption that the last attached morpheme in the derivational history of a verb determines the grammatical aspect of that verb, and makes the other morphemes inaccessible. For instance, Biskup (2023), observes that (im)perfectivity of Slavic predicates can be overwritten by an aspectual morpheme that merges later in the course of the verb formation process. He views this as a phenomenon falling under cyclicity, as used in syntax, semantics, and phonology for phenomena in which only the structurally highest information is accessible to operations. He suggests that this could be implemented via the syntactic operation *agree* with the aspectual head that 'sees' only the closest aspectual affix having a perfective or an imperfective value.

That the last attached morpheme determines the grammatical aspect of a Slavic verb is well-known and well-motivated as a general strong tendency (see, e.g., Karcevski, 1927; Isačenko, 1962; Vinogradov, 1986; Zinova & Filip, 2015; Zinova, 2021). However, from this it does not follow that the other morphemes become 'invisible', or inaccessible, to combinatorial rules in which a morphologically complex verb form is involved when the meaning of larger phrases and sentences into which it is integrated is computed. We can illustrate this key point with the following compatibility contrasts of different imperfective verbs with *do konca* 'until the (very) end, completely':

(54) *Saša* ***měšal***$^{\text{IPFV}}$ *sup ložkoj ?do konca.* Russian
Saša stir.PST.3SG soup.ACC spoon.INSTR to end
'Saša stirred (some/the) soup with a spoon ?until the end/completely.'

(55) *Napisav pis'mo Čexov, podumav,* ***pripisyval***$^{\text{IPFV}}$ *neskol'ko strok ?do konca.*
having.written letter Chekhov having.thought ADD.write.IPFV.PAST.3SG several lines to end
'Having written the letter, Chekhov, after some thought, added several lines ?until the end / ?completely.'

(56) *Čexov* ***dopisyval***$^{\text{IPFV}}$ *pis'mo do konca.*
Čexov TERM.write.IPFV.PAST.3SG letter to end
'Chekhov finished writing the/some letter until the end/completely.'

(57) *Ja* ***pročityval***$^{\text{IPFV}}$ *pis'mo do konca.*
I PERDUR.read.IPFV.PAST.3SG letter to end
'I (have) read the letter through to the end.'

The Russian *do konca* 'until the (very) end, completely' in the above imperfective sentences strongly invites the inference that the events described by the above prefixed secondary imperfective verbs terminated or culminated in the past (see also e.g., Altshuler, 2014 for similar Russian examples and observations). Put in scalar terms, *do konca* roughly expresses 'all the way to the maximal upper bound of the relevant property scale'. Generally, it functions as a modifier of closed scale expressions with an orientation to the maximal value of the relevant property scale. In the verbal domain, *do konca* is compatible with telic predicates that are lexically associated with a maximal upper bound closed scale, but not with predicates that are not, be they telic or atelic.

Kratzer (2004) argues that the imperfectivizing suffix uniformly derives atelic predicates. Hence, the prefixed secondary imperfectives in (55)–(57) should have a uniform denotation (mimicking that) of atelic predicates, and behave like the primary imperfective verb in (54), which is a bona fide atelic verb. This predicts that all the imperfectives in the above examples, one primary and three secondary, should be incompatible with *do konca* 'until the (very) end, completely'. However, they are not. From the contrast between (54) with the primary (prefixless) imperfective verb, on the one hand, and (56) and (57) which contain prefixed secondary imperfectives, on the other hand, we can conclude that not all the prefixed secondary imperfective verbs have a uniform denotation akin to that of bona fide atelic predicates denoted by primary imperfective verbs. The contrast among prefixed secondary imperfective verbs, i.e., (55), on the one hand, and (56) and (57), on the other hand, indicates that prefixed secondary imperfectives differ in their semantic properties, some (as in (55)) pattern like primary imperfectives (as in (54)) with respect to *do konca* while others (as in (56) and (57)) do not. This raises the following questions: What accounts for the difference in the compatibility of *do konca* 'until the (very) end, completely' with different primary and secondary imperfective verbs?

In order to answer this question, we may start with observing that all the three prefixes in the above examples, *pri-* in its additive use (glossed as ADD), *do-* in its terminative use (glossed as TERM), and *pro-* in its perdurative use (glossed as PERDUR), form secondary imperfectives which, on their progressive reading give rise to the imperfective paradox/partitive puzzle (D. R. Dowty, 1977, 1979; Bach, 1986):

(58) *Čexov* ***pripisyval***$^{\text{IPFV}}$ *neskol'ko strok.*
Chekhov ADD.write.IPFV.PAST.3SG several lines.
'Chekhov was adding several lines (by writing them down).'
↛

*Čexov* ***pripisal***$^{\text{PFV}}$ *neskol'ko strok.*
Chekhov ADD.write.PAST.3SG several lines.
'Chekhov added several lines (by writing them down).'

(59) *Čexov* ***dopisyval***$^{\text{IPFV}}$ *pis'mo.*
Čexov TERM.write.IPFV.PAST.3SG letter
'Chekhov was finishing writing the/some letter.'
$\not\rightarrow$
*Čexov* ***dopisal***$^{\text{PFV}}$ *pis'mo.*
Čexov TERM.write.PAST.3SG letter
'Chekhov finished writing the/some letter.'

(60) *Ja* ***pročityval***$^{\text{IPFV}}$ *pis'mo.*
I PERDUR.read.IPFV.PAST.3SG letter
'I was reading through the letter.'
$\not\rightarrow$
*Ja* ***pročital***$^{\text{PFV}}$ *pis'mo.*
I PERDUR.read.PAST.3SG letter
'I read the letter through.'

Generally, as is well-known and observed above, the imperfective paradox/partitive puzzle arises just in case the progressive operator, or the imperfective operator in an imperfective sentence with a progressive interpretation, takes scope over a telic predicate (but not when it scopes over an atelic predicate).

The observation that the inferences in (58)–(60) are invalid must be due to the contribution of the prefixes, because the primary imperfective verbs *pisat'* 'to write'/'to be writing' and *čitat'* 'to (be) read(ing)' from which they are derived are atelic, just like the primary imperfective verb *měšat'* 'to (be) stir(ring)/mix(ing)'. Recall that according to Kratzer (2004) all prefixed verb stems determine a culmination condition and imply culmination, i.e., are telic and instantiate the function posited for the interpretation of perfective aspect. However, as Kratzer (2004) also argues, this telic/perfective contribution of prefixes must be neutralized by the application of the imperfectivizing suffix to prefixed verb stems, which derive atelic predicates. If the above prefixed secondary imperfectives were atelic, due to their imperfectivizing suffix, then they should pattern with primary imperfectives like *měšat'* 'to (be) stir(ring)/mix(ing)', which is clearly atelic (lacking both the culmination condition and requirement). Therefore, all the inferences in (58)–(60) would have to be valid, just as in (43). But they are invalid, contrary to Kratzer's prediction.

We may provide a straightforward account for the above invalid inferences, if we reject Kratzer's characterization of telicity in terms of culmination requirement, which corresponds to the interpretation of perfective aspect, and by the same token her claim that Russian verb prefixes spell out the *[telic]* inflectional head feature, thus instantiating the function posited by for the interpretation of perfectivity. It is precisely Kratzer's claim that Russian prefixes carry the culmination requirement, which forces her to make the unwarranted proposal that the function of the Russian imperfective operator (carried by the imperfectivizing suffix) be assimilated to that of the progressive operator and uniformly 'neutralizes' the meaning of 'telic prefixes' when applied to prefixed verb stems.

As proposed in (46) above, for a predicate to be telic it is sufficient to specify a culmination condition. They do not introduce the culmination requirement. If we allow for telic verb stems in natural languages to merely specify the culmination condition without implying culmination requirement, contrary to Kratzer's hypothesis (49), the motivation for the unwarranted treatment of the Russian imperfective operator carried by the imperfectivizing suffix as a progressive operator disappears.

In view of the proposed telicity, Russian prefixed verb stems may be telic, if they merely specify a culmination condition due to the contribution of their prefixes, and as

such, they are compatible with the meaning of the imperfectivizing suffix. Hence, its application to prefixed verb stems does not 'neutralize' their culmination condition, but it yields prefixed secondary imperfective verbs that retain their culmination condition, and so are telic, and prefixed secondary imperfectives have both culminated and non-culminated events in their denotation. When such prefixed secondary imperfective verbs are used in sentences with a progressive reading (and so are constrained to denote only non-culminated events at a given reference time and world), as in (58)–(60), their telicity (understood in terms of a culmination condition) straightforwardly motivates that they do not sanction inferences to their perfective counterparts. That is, we can straightforwardly motivate the imperfective paradox/partitive puzzle.

In summary, such observations and arguments motivate the rejection of Kratzer's hypothesis (49) that in natural languages there may be no verb stems that merely specify a culmination condition without requiring culmination. Russian prefixed verb stems arguably merely specify a culmination condition, which makes them telic, on the revised view of telicity proposed here. Moreover, crucially, the meaning of their prefixes, cannot be 'neutralized' by the imperfectivizing suffix, because it must be accessible to the combinatorial rules by which the meaning of a sentence is derived, as witnessed by the imperfective paradox/partitive puzzle, as has just been shown. Now, we can turn to answering our original question, which provides an additional argument for this claim: What accounts for the difference in the compatibility of *do konca* 'until the (very) end, completely' with different primary and secondary imperfective verbs?

The answer to this question lies in the scalar properties of verbs, and specifically in the case of prefixed verbs in the scalar properties of prefixes with which they are formed. Given that *do konca* approximately means 'until the (very) end, completely', which, in scalar terms, amounts to (oriented towards and possibly) reaching the maximal upper bound of a closed scale, for a verb to be compatible with it, it must be lexically associated with an upper bound closed scale, which implies that that verb must be telic. This straightforwardly motivates that *do konca* cannot modify the primary imperfective prefixless verb *měšat'* 'to (be) stir(ring)/mix(ing)' in (54), because it is atelic, and not lexically associated with a scale.

As described in (55), the additive prefix *pri-* is incompatible with *do konca* 'until the (very) end, completely'. In scalar terms, it can be analyzed as expressing a bounded measure of change to a higher degree on a scale, but not to the maximal upper bound of a closed scale. This, as I propose, is sufficient to motivate the telicity of the prefixed stem it forms, in so far as it allows to specify what must be the case if an event denoted by a *pri*-stem culminates, and also its incompatibility with *do konca* 'until the (very) end, completely' in (55). Just like other Slavic prefixes that have uses in which they can be assimilated to vague measure functions (see Filip, 2005a, 2008), the additive prefix *pri-* can be analyzed as expressing an additive measure function on eventualities derived from measures on objects.

Generally, a derived measure function indirectly measures entities in a certain domain by measuring entities in another domain, which is homomorphically related to the first domain (Krifka, 1989). The additive prefix *pri-* indirectly measures the sum of an eventuality $e_1$ (which is presupposed) and an eventuality $e_2$ (which is asserted) by measuring the sum of the cardinalities, volumes, weights, etc. of the individuals participating in $e_1$ and $e_2$. Intuitively, the more lines are added to the letter, the more developed the described (asserted) eventuality of the letter writing is than the cross-temporally identical (presupposed) earlier eventuality. An eventuality $e_2$ is a more developed version of an eventuality $e_1$, $e_1 \leq e_2$, and $e_1$ 'grows into' $e_2$ (borrowing the formulation of Landman, 2004, see also further below).

In contrast, the prefixed secondary imperfective verb *dopisyvat'* (ipfv) 'to (be) finish(ing) writing' in (56) is compatible with *do konca* 'until the (very) end, completely', because *do-* is

lexically associated with the maximal upper bound of a closed scale. Its scalar semantics overlap with that of *do konca* 'until the (very) end, completely'. In (57), the prefix *pro-* has a perdurative use, and it is also lexically associated with the maximal upper bound of a closed scale, but in contrast to *do-* it also lexicalizes the phases preceding the final phase of described events. This motivates the compatibility of the secondary imperfective verb *pročityvat'* (ipfv) 'to (be) read(ing) through' in (57) with *do konca*.

The scalar semantics of the terminative *do-* and perdurative *pro-* qualifies them as 'telic prefixes' par excellence in Kratzer's sense, because they crucially contribute to the specification of a culmination condition, which in Kratzer's framework is inseparable from the culmination implication, and so together they make up the content of the telic operator in Kratzer's terms. However, it is precisely this telic component of *do-* and *pro-*, which relies on their scalar semantics, as I propose, which, according to Kratzer, must be overwritten or 'neutralized' by the imperfectivizing suffix taking scope over it. If it were the case, and the prefixed secondary imperfective verbs they form were uniformly atelic, then they should all be incompatible with *do konca* 'until the (very) end, completely', contrary to facts.

In sum, the three prefixes in (55)–(57) contribute to specifying a culmination condition, which makes them telic in the sense characterized here (see (46)), and motivates the observation that the secondary imperfectives in which they occur give rise to the imperfective paradox/partitive puzzle (see (58)–(60)). Their culmination condition derives from finer details of their scalar semantics, which in turn motivates the differences in their compatibility with *do konca* 'until the (very) end, completely', as witnessed by the difference between *pri-* in (55) which is incompatible with it, on the one hand, and *do-* in (56) and *pro-* in (57) which are compatible with it, on the other hand. In order to motivate such data with prefixed secondary imperfective verbs, the lexical meaning of prefixes cannot be 'neutralized' by the imperfectivizing suffix taking scope over them, making them inaccessible to semantic and syntactic processes at the level at which the meaning of sentences is calculated, contrary to Kratzer (2004). But this also requires that Russian (and Slavic) prefixes cannot be treated as uniformly instantiating the function for the interpretation of perfective aspect, contrary to Kratzer (2004).

Unlike Kratzer (2004), Borer (2005) denies that lexical semantic properties have any role in determining (a)telicity. Slavic verb prefixes are perfective markers, with the status of inflectional grammatical morphemes, which function "on a par with the way that past tense marking is the phonological spellout of a head feature which assigns range to [$_{TP}$ <e>$_{T}$], and 'plural' marking a phonological spellout of a head feature assigning range to [$_{CL}$ Max <e>$_{DIV}$]" (Borer, 2005, p. 159, Chapter 15, Volume II). For Borer (2005), it is the 'quantity' (telic) feature of Slavic prefixes that motivates Slavic perfectivity. Any perfective verb contains a 'quantity(-telic) prefix', which may be overt or phonologically null, as in the case of primary perfective verbs (see (1)), which have no overt prefixes (Borer, 2005, pp. 159, 168–169, Volume II).[24] All perfective verbs are opposed to primary (root) imperfectives that have no prefix, and so do not generate the syntactic quantity/telic structure, which makes them uniformly atelic (Borer, 2005, Chapter 15, Volume II, p. 161).

In tying the syntactic feature of 'quantity' to telicity and perfectivity, Borer (2005) is inspired by some independent proposals of Filip (1996, 2000) (and also Filip, 1992, 2005a; Filip & Carlson, 2001). Filip (ibid.) observes that a number of Slavic verb prefixes (among about twenty in each Slavic language) have common meanings/uses that have a quantificational and/or measurement import, in addition to deriving perfective verbs. Such meanings/uses can be analyzed in terms of lexical A(dverbial)-quantifiers or assimilated to the meanings of extensive or intensive measure functions (see, e.g., Krifka 1989), which range over the variable introduced by the (Strictly) Incremental Theme argument and determine its quantificational and referential properties.[25]

A good example is the prefix *na-*, which across different Slavic languages has a common (ac)cumulative use (in traditional Aktionsart terminology) approximately meaning 'a lot', 'many', 'much', 'a (relatively/sufficiently) large quantity/measure of' (among other uses). It is illustrated in the Czech perfective verb *napéct*, as in (27b), which roughly means 'to bake a (relatively/sufficiently) large quantity/measure of/a lot of/many *x*'. Besides deriving a prefixed perfective verb from an imperfective simplex stem, the aspectual composition of this perfective verb with its bare plural DO *housky* 'rolls' (Strictly Incremental Theme) results in the vague measurement or quantificational meaning of *na-* being 'transferred' onto 'rolls' with the effect that it is interpreted as 'a (relatively/sufficiently) large quantity/measure of/a lot of/many rolls'. Consequently, the complex predicate 'to bake a (relatively/sufficiently) large quantity/measure of/a lot of/many rolls' fails to be quantized on its own, and it also fails to entail culmination of described events relative to some determinate upper bound, or terminal point. Put differently, the accumulative use of the prefix *na-* gives rise to the quantization (telicity) puzzle (Filip, 1992, 2000), as observed above with respect to the attenuative/delimitative use of the prefix *po-*. Moreover, the vague measurement meaning effect of *na-* on the bare plural DO-DP/Strictly Incremental Theme *housky* 'rolls' motivates its obligatory narrow-scope existential, non-specific interpretation, in effect behaving like an incorporated nominal.

In Borer (2005), the Czech prefix *na-*, as in (27b), serves as one of the paradigm examples of Slavic verb prefixes. Borer (2005) rejects "any account of telicity which crucially relies on the assignment of some particular role to some particular argument, e.g., theme, regardless of whether it is assigned by the verb or through any other means" Borer (2005, Chapter 14). Instead, Slavic prefixes uniformly generate the functional perfective-telic syntactic structure: "[W]hen *na-* or *u-*, or any other quantificational prefix, attaches to the verb stem, and provided that no other marking is added, a quantity/telicity interpretation always emerges" (Borer, 2005, p. 163, Chapter 15, Volume II). Specifically, Slavic verb prefixes license ('assign range to') the [$_{\text{ASPQ}}$ <e>$_{\#}$] head, giving rise to telic semantics, and also do the double duty of uniformly "making the event quantity, and assigning quantity to the DP" (Borer, 2005, p. 163, Chapter 15, Volume II). This is captured by the following representation, where the prefix slot is filled with the prefix *na-*:

(61) [$_{\text{ASPQ}}$ [$_{\text{DP}}$ <e$^{\alpha}$>$_{\#}$ [$_{\text{ASPQ}}$ ***na-***$^{\alpha}$ <e$^{\alpha}$>$_{\#}$]]

The prefix *na-* licenses/assigns range to [$_{\text{ASPQ}}$ <e>$_{\#}$] and also assigns its 'quantity' value to [$_{\text{DP}}$ <e>$_{\#}$] through agreement with the value of # in $\text{ASP}_{\text{Q}}$, where $\alpha$ is the specific range assigned by *na-* to DO-DP *housky* 'rolls' via specifier–head agreement. This allows to capture Filip's observation that the meaning component of *na-*, as in (27b), which amounts to a quantificational meaning of 'a lot of', 'many' (cardinal/weak interpretation) or a measurement meaning of approximately 'a (relatively) large/sufficient quantity of', is 'transferred' to the bare plural DO-DP *housky* 'rolls' which is interpreted as 'a lot of/many rolls' or 'a (relatively) large/sufficient quantity of rolls'.

Given the above assumptions, Borer (2005, 159, Vol. II) argues that " Filip's (2000) conclusion, separating what she refers to as perfective aspect from the semantics of quantificational prefixes, is in error." We may first clarify that the perfective aspect in Filip is understood as a formal (grammatical) property of Slavic verbs, as is commonly assumed, and one which is reflected in standard tests for Slavic grammatical perfectivity (see above). With this clarification in place, there are at least four arguments that can be adduced showing that perfectivity must be severed from verb prefixes, both formally and semantically, and specifically that Slavic perfectivity cannot be reduced to the syntactic property of 'quantity(-telicity)' predictably linked to verb prefixes:

(i) Not all Slavic prefixes have vague measurement or weak quantificational meanings/uses. They do not qualify as 'quantity' prefixes in any meaningful sense of 'quantity'.

(ii) Slavic prefixes that have vague measurement or weak quantificational meanings/uses typically have other meanings/uses that have nothing to do with quantification or measurement, as these notions are standardly understood. It is unclear how this observation can be accounted for in the theory of Borer (2005).

(iii) Slavic prefixes have common uses in which they have 'quantity'-related or quantificational import, but not with respect to their DO-DPs, contrary to the syntactic 'quantity/telicity' structure given in (61).

(iv) The analysis of prefixed secondary imperfectives leads to unwarranted assumptions about the Slavic perfective/imperfective opposition, and the architecture of morphologically complex Slavic verbs.

First, not all the Slavic prefixes are 'quantity' prefixes in the sense of Borer (2005); i.e., they have no vague measurement or weak quantificational meanings/uses, no quantificational force, or involve no notion of quantity. Take, for instance, the Czech prefixes *na-* and *u-*, which Borer uses as paradigm examples to illustrate the functioning of Slavic 'quantificational' prefixes (Borer, 2005, p. 163, Chapter 15, Volume II). Take, for instance, the Czech prefix *u-* in the following example, which is used by Borer as one of the paradigm examples of a 'quantity' prefix (Borer, 2005, ex.(4), Chapter 15, Volume II):

(62) *Petr* ***upekl***$^{\text{PFV}}$ *housky*. Czech
Peter **u.**baked rolls.
'Peter baked (all) the rolls.'

Here, the bare plural DO-DP *housky* 'rolls' has a definite specific interpretation, which is triggered by the perfective verb *upekl* 'he baked'. This so-called 'definiteness effect' (see, e.g., Forsyth, 1970; van Hout, 2008, i.a.) is confounded in Borer (2005) with what she takes to be the quantificational effect of the prefix *u-*. The definite interpretation is not of quantificational nature (see, e.g., Partee, 1995), and as Filip (1993, 1999) argues, the perfective verb *upekl* 'he baked' only has culminated events of baking in its denotation, and because it is an incremental verb, it has as part of its lexical meaning object–event mappings between the part structure of its eventuality argument and the part structure of the referent of the Strictly Incremental Theme argument 'rolls' (see Krifka, 1987, 1998; D. Dowty, 1991; Filip, 1993, 1999, and further below). The mappings correlate one whole culminated event of baking with the totality of objects that come into existence as a result of that baking event. Given that *housky* 'rolls' is a bare plural DP, this generates the inference that there was some understood totality of rolls in the context, which was baked. To accommodate this inference, the bare plural DO-DP *housky* 'rolls' is shifted into the definite specific interpretation, whereby the relevant intended totality is understood to be recoverable from context.

The systematic 'definiteness effect' of perfective verbs on their arguments can only be observed when a perfective verb is composed with a bare (determinerless) cumulative (i.e., mass or plural) (Strictly) Incremental Theme argument, and there are no quantifiers or measure expressions encoded by verb-internal operators (like prefixes) or other sentential constituents, and the bare cumulative (Strictly) Incremental Theme is not in the scope of modal operators (see Filip, 2004, 2005b). This can be shown in the following example, where there is no 'definiteness effect' on the DO-DP/(Strictly) Incremental Theme argument, which is singular count, or plural quantified. Moreover, as we also see in the following Czech example, unlike the (ac)cumulative use of *na-* in (27b), the prefix *u-* imposes no constraints on the quantity of the referents of its DO-DP/Strictly Incremental Theme:

(63) *Petr* ***upekl***$^{\text{PFV}}$ *housku / málo housek / hodně housek / jen dvě housky.*
Peter **u.**baked roll / a.few rolls / many rolls / only two rolls.
'Peter baked { a | some | the } roll / a few rolls / many rolls / only two rolls.'

Second, and related to the first point, Slavic prefixes that have vague measurement or weak quantificational meanings/uses may have other meanings/uses that have nothing to do with quantification or measurement, as these notions are standardly understood (see Filip, 1992, 1996, 2000 and elsewhere). Borer's formula given in (61) requires a uniform quantificational effect of all prefixes on the DO-DP. It is, therefore, unclear how we can account for the difference in the use of the Czech prefix *na-* in (28b), where it has no quantificational, measurement import, as opposed to its quantificational or vague measurement use in (27b).

While the prefix *na-* in (27b) has the (ac)cumulative meaning, i.e., a vague measurement or weak quantificational meaning, it does not have this quantity-related use in (28b) at all. In (28b), *na-* has a detectable idiosyncratic lexical meaning component (that goes beyond that of the perfective aspect of its containing perfective verb), but this meaning component has nothing to do with quantification or measurement, unlike in (27b). Rather, it arguably has to do with spatial locative/directional orientation, as observed above. Claiming that *na-* in (28b) is a quantity prefix, has a quantificational force, would render the notion of quantity and quantification meaningless.

As we have seen above, the prefix *na-* in the perfective verb *napsat* (pfv) 'to write up' in (28b), unlike *na-* in (27b), imposes no constraints on the quantity, the count/mass properties or number of its DO-DP/Strictly Incremental Theme. In in (28b), the perfective verb *napsat* (pfv) 'to write up' entails that described writing events have culminated with respect to a creation of (what is taken to be) some contextually recoverable totality of homework assignments, denoted by its Strictly Incremental Theme argument. Similarly as in (62), what is at stake here is the correlation 'a complete event ≈ a totality of a (plural) object of creation', which concerns a part-whole structure of entities. This in turn leads to the contextually determined specific definite interpretation of the bare plural DO-DP/Strictly Incremental Theme argument 'homework assignments'.

In contrast, the Czech perfective verb *napéct* (pfv) in (27b), which due to *na-* roughly means 'to bake a (relatively) large quantity of *x*' (a vague measurement meaning) or 'to bake a lot of *x* / many *x*' (vague weak/cardinal quantificational meaning), requires that its Strictly Incremental Theme argument be cumulative, and has an obligatory narrow-scope existential, non-specific interpretation, in effect behaving like an incorporated nominal (for details see Filip (1992, 2000, 2005a). Moreover, (27b) entails no culmination or completion with respect to some determinate lexically specified culmination condition, and also fails to be quantized (see observations above regarding the quantization (telicity) puzzle, Filip, 2000). The correlation 'complete event ≈ a totality of a (plural) object of creation' does not apply here, unlike in (28b).

While in both (27b) and (28b) the perfective verbs are derived by means of the prefix *na-*, their perfective semantics cannot be reduced to some shared meaning component(s) that underpins both *na-* in (27b) where it is used as a vague measure function or a weak vague quantifier and *na-* in (28b) where the perfective verb denotes culminated events, and *na-* still has a detectable locative/directional meaning, as observed above. Such semantic differences between different uses of prefixes, even different uses of the same prefix form, and consequently between different meanings of prefixed perfective verbs, cannot be motivated by Borer's uniform 'quantity(-telicity)' analysis of Slavic verb prefixes, and the syntactic structure given in (61).

Third, Slavic prefixes have common uses in which they have some quantity-related or quantificational import, but not with respect to their DO-DPs. Borer's syntactic structure

given in (61) requires that any Slavic prefix generates the syntactic 'quantity'(-telic) structure giving rise to perfectivity and the DO-DP of prefixed verbs must acquire the 'quantity', quantificational, meaning, from their prefixes. Consider (64) (repeated here for convenience, see also (43) and (50) above):

(64) *Saša pomĕšal*$^{\text{PFV}}$ *sup* *ložkoj*.
Saša ATN/DEL.stir.PST.3SG soup.ACC spoon.INSTR
'Saša stirred (some/the) soup with a spoon [for a short time, in a gentle way, somewhat . . . ]
ATN: attenuative, DEL: delimitative

The prefix *po-* is here used with what is traditionally labeled as the attenuative or delimitative (Aktionsart) meaning. (64) does not mean that a relatively small quantity of soup was subjected to the event of stirring or mixing, i.e., the bare mass DO-DP 'soup' does not have a weak quantificational reading of 'a little soup', or a vague measurement reading like 'a (relatively) small quantity of soup', contrary to Borer's prediction, which follows from (61). Rather the prefix *po-* here modifies the manner in which that event took place, namely with a relatively low effort, for a short time, and the like. It is the context that determines the referential property of the bare mass DO-DP 'soup'. In the most general terms, the prefix *po-* is lexically associated with an open scale and a low degree of some relevant measured property, which, however, is not the quantity of the referent of one of the nominal arguments of the perfective *po*-verb.

Now contrast the use of *po-* in (64) with the prefixes in the following sentences. They only differ in their prefixes, and each prefix has an effect on the quantificational or measurement and referential interpretation of the determinerless mass DO-DP 'brandy', whereby each prefix induces a different interpretation:

(65) a. *Saša popil*$^{\text{PFV}}$ *konjačok/konjačka*.
Saša ATN.DEL.drank.3.SG brandy.DIM.SG.ACC/GEN ATN: attenuative
'Saša drank a little brandy.' DEL: delimitative

b. *Saša napilsja*$^{\text{PFV}}$ *konjačka*.
Saša ACM.drank.3.SG brandy.DIM.SG.GEN. ACM: (ac)cumulative
'Saša drank a lot of brandy. (also possibly 'He got drunk on brandy.')

c. *Saša vypil*$^{\text{PFV}}$ *konjačok*.
Saša EXH.drank.3.SG brandy.DIM.SG.ACC EXH: exhaustive
'Saša drank (up) (all) the brandy.'

Notice, first, that in (65a), the prefix *po-* has the same attenuative or delimitative (Aktionsart) meaning/use as *po-* in (64), but in (65a) the combination of the perfective *po*-verb with the bare mass DO-DP 'brandy' results in its weak quantificational meaning of 'a little brandy' or a vague measurement 'a (relatively) small quantity of brandy'. In contrast to (64), the *po*-verb here imposes no constraints on the duration of the described event, or the manner in which it was carried out. (Sipping on a relatively small portion of brandy need not take a short time.)

The reason why the attenuative/delimitative prefix *po-* in (65a), but not in (64), determines the quantificational or measurement properties of the DO-DP has to do with the lexical meaning of its base imperfective stem. In (65a), it is a strictly incremental relation, but not in (64). In (65a), *po-* is attached to the stem of the primary imperfective *pit'* 'to (be) drink(ing)', a strictly incremental verb, while in (64), it is a stem of the primary imperfective *měšat'* 'to (be) stir(ring)'/'to (be) mix(ring)' which is not an incremental verb (see, e.g., Filip, 1992, 2000, 2005a). A part of the lexical meaning of (strictly) incremental verbs is the entailment that there exists a mapping (a homomorphism in the case of strictly incremental verbs) between the part structure of their eventuality argument and the part structure of the

referent of their (Strictly) Incremental Theme argument (see Krifka, 1987, 1998; D. Dowty, 1991; Filip, 1993, 1999).

Prefixes that have uses which are akin to vague quantifiers or measures can be analyzed as vague extensive measure functions that directly apply to the (Strictly) Incremental argument. As extensive measure functions do, they require that this argument be bare cumulative (mass or plural), and yield meanings that can be assimilated to the meanings of vague measure phrases, e.g., 'a relatively small measure of brandy' in (65a) or 'a relatively large measure of brandy' in (65b). The measure interpretation of the bare cumulative (Strictly) Incremental Theme argument motivates its obligatory narrow-scope existential, non-specific interpretation, in effect behaving like an incorporated nominal. (For details of this analysis, see Filip (1992, 2000, 2005a).[26]

As has been observed above, it is often claimed that Slavic perfective verbs have a uniform 'definiteness effect' on direct objects (see, e.g., Forsyth, 1970; van Hout, 2008, i.a.). However, this effect is only restricted to determinerless cumulative (Strictly) Incremental Theme arguments, under specific conditions (see Filip, 2004, and above). As (65a) and (65b) show, perfective verbs here are formed with prefixes that have a vague measurement use or a weak quantificational force, which enforce an obligatory narrow-scope existential, non-specific interpretation of their DO-DP/Strictly Incremental Themes, and never allow for their referentially specific interpretation. What is referred to as the 'definiteness effect' can be observed in (65c). Here, the prefixed perfective verb *vypil* 'he drank up' contains the prefix *vy-* which carries no quantificational or measurement meaning, but rather a meaning which might be characterized as 'exhaustive' (put in scalar terms, approximately 'all the way to the upper bound of the relevant property scale'). The perfective *vypil* 'he drank up' denotes culminated events, and because it is a strictly incremental verb, by the same line of reasoning as applied in (62), it induces the definite specific interpretation of its bare mass DO-DP/Strictly Incremental Theme 'brandy'.

To summarize, we have seen that there are substantial differences in the meanings/uses of Czech and Russian prefixes, and among prefixed perfective verbs they form, as well as differences in the effects they have on the referential and quantificational properties of their nominal arguments. This variety makes it implausible that the meanings/uses of Slavic verb prefixes be reduced to a single 'quantity' notion that corresponds to the meaning of Slavic perfectivity and with a uniform effect on all and only the DO-DP, as proposed by Borer (2005), and captured by the syntactic structure given in (61). Such a purely syntactic approach fails to cover perfective verbs with prefixes that have no quantificational force, no measurement or other quantity-related meanings/uses, as in (28b). For prefixes that have meanings/uses of quantificational or measurement nature, Borer's proposal cannot motivate when these meanings/uses will have effects on the interpretation of their DO-DP (as in (65a) and (65b), and when not (64), precisely because it denies that lexical semantic properties of a verb play any role in determining telicity, which corresponds to the syntactic quantity(-telic) structure giving rise to perfectivity of a VP and a S, and neither does its semantic argument structure and a particular thematic relation (e.g., Theme) assigned to its DO-DP.[27]

Fourth, prefixed secondary imperfective verbs pose an indomitable challenge for Borer (2005) as they do for Kratzer (2004), as we have seen above. Let us consider the following Russian example in which the (ac)cumulative prefix *na-*, a quantity-prefix par excellence in Borer's data, co-occurs with the imperfectivizing suffix:

(66) *napivat'sja*$^{\text{IPFV}}$ Russian
ACM.drink.IPFV.INF.REFL
'to (be) drink(ing) a lot (and get drunk)'

On Borer's account, the source of the atelicity of a verb is the absence of a prefix on that verb, and hence the absence of the syntactic quantity(-telic) structure. The atelicity of the prefixed secondary imperfective verb cannot be motivated by the absence of this structure, because it is formed by applying the imperfectivizing suffix to a perfective stem that, by definition, must contain a prefix that generates the syntactic quantity(-telic) structure. This gives rise to two seemingly incompatible pieces of morphology on one and the same secondary imperfective verb: a prefix which encodes telicity and the imperfectivizing suffix which encodes atelicity.

In order to resolve this apparent clash, similarly to Kratzer (2004), Borer (2005) arrives at the conclusion that Slavic verb prefixes and the imperfectivizing suffix must operate on different levels of analysis. In this respect, Borer agrees with many, and also concurs with Filip (1992, 1996, 2000). However, she rejects Filip's implementation of this uncontroversial idea. The reason for this is that for Filip the co-occurrence of prefixes with the imperfective operator carried by the imperfectivizing suffix on the same prefixed secondary imperfective verb serves as one of the arguments for separating Slavic verb prefixes, formally and semantically, from the perfective operator. According to Filip, and as observed above, Slavic verb prefixes belong to derivational morphology, which operate at the level of inner aspect (see above (15)). The imperfectivizing suffix, which has some properties of a grammatical (inflectional) marker of imperfectivity (see Section 3 above), belongs to a higher level of grammatical aspect operators, along with the perfective operator, i.e., it is located at the syntactic level of outer aspect, as many agree. The co-occurrence of Slavic verb prefixes with the imperfectivizing suffix on the same secondary imperfective verb is then unsurprising, and in fact predicted.

In contrast, according to Borer (2005), Slavic verb prefixes are grammatical markers of perfectivity, and are of an inflectional nature, and perhaps surprisingly, they are located at the level of inner aspect. This view of Slavic prefixes and perfectivity is a significant departure from syntactic theories of aspect that treat Slavic verb prefixes as grammatical (inflectional) markers perfectivity, just like Borer (2005) does, but unlike in Borer (2005), they occupy the head of a functional projection located (at least as high as) in the upper V head, but in any case above the low(er) VP structure which is dedicated to the inner aspect (see, e.g., Smith 1991, Chapter 10; Slabakova, 1997, 2005, and references therein). On Borer's account, (a)telicity is a feature of inner aspect, the level at which the source of telicity of perfective verbs is the presence of a prefix (overt or covert), which generates the syntactic quantity(-telic) structure giving rise to perfectivity. They stand in direct opposition to primary imperfective verbs syntactically characterized by the absence of a prefix, and so the syntactic quantity(-telic) structure.

Borer (2005), just as Filip (1996, 2000), Kratzer (2004), and many others, makes the uncontroversial assumption that the Slavic imperfectivizing suffix, can be viewed as a grammatical (inflectional) marker of aspect and analyzed at the level of outer aspect (see Section 3 above). At the same, however, just as Kratzer (2004), and many others, Borer (2005) makes the erroneous assumption that it has a meaning that corresponds to a progressive operator.[28] Specifically, Borer adapts Zucchi's (1999) proposal that the Slavic imperfectivizing suffix has a function posited by Landman (1992) for the interpretation of the English progressive aspect: namely, the imperfectivizing suffix takes as input a predicate of complete (or culminated) events and yields predicates of complete/incomplete events (Zucchi, 1999, p. 197). Zucchi (1999) also assumes that the Slavic imperfectivizing suffix applies to prefixed perfective stems, given that Slavic verb prefixes, according to him, instantiate the same function that is posited by Parsons (1990) for the interpretation of perfectivity in English.

https://doi.org/10.3390/languages11010005

It is worth mentioning that Zucchi adheres to the common view, along with Kratzer (2004) and Borer (2005), which is contested here, that Slavic verb prefixes are markers of perfective aspect (see (19) and (36)). On Zucchi's view, Slavic verb prefixes, when applied to primary imperfective stems, which denote complete/incomplete events, yield prefixed perfective stems denoting only complete (or culminated) events. As we have seen above, this generalization cannot motivate the complex and varied behavior of Slavic verb prefixes. Among other data, it is invalidated by Slavic verb prefixes that derive verbs that do not denote complete (or culminated) events, and which give rise to the quantization (telicity) puzzle (Filip, 2000, also Filip, 1992, 1996, 2005a, which, for instance, is illustrated by (50).

Borer's attempt at solving the puzzle posed for her theory by secondary imperfectives rests on the proposal that the imperfectivizing suffix, which is akin to the progressive operator, according to her, is located at the level of outer aspect, but primary imperfectives (without the imperfectivizing suffix) are analyzed at the level of inner aspect where they stand in direct opposition to all perfective verbs. This proposal leads her to an overarching, and rather unorthodox, conclusion about Slavic imperfectivity: "Slavic 'imperfectivity' is neither semantically nor a morpho-phonologically (or syntactically) a well-defined notion" (Borer, 2005, p. 169), which is "eminently plausible given their different morpho-phonological status, and we will assume it to be so without further discussion (. . . ) Being concerned here primarily with the inner aspect, I leave this matter aside"(Borer, 2005, p. 169).

This programmatic proposal is unfeasible, both on empirical and theoretical grounds. Setting aside that the Slavic imperfectivizing suffix is not reducible to the semantics of the progressive operator (also contrary to Zucchi, 1999; Kratzer, 2004, among many others), there are many empirical arguments that motivate, indeed necessitate, the treatment of Slavic primary imperfectives and secondary imperfectives as one coherent grammatical class, the differences in their morpho-phonological properties notwithstanding. As is well-known, they pattern alike with respect to a number of distributional and semantic properties that systematically set imperfective verbs as a whole class apart from the class of perfective verbs. Crucially, both primary and secondary imperfectives have a progressive reading in an appropriate context, hence the fact that secondary imperfectives may have a contextually determined progressive reading does not set them apart from primary imperfectives. However, the possibility of a contextually determined progressive reading sharply separates all imperfective verbs from perfective verbs, which can never describe eventualities that are ongoing at a particular reference time. The availability of a progressive reading is invalid as an argument for separating secondary imperfectives from primary imperfectives: the former located at the level of outer aspect and the latter of inner aspect. Moreover, unlike perfective verbs, as already mentioned, all imperfective verbs are straightforwardly compatible with the future auxiliary, phasal verbs, durative temporal adverbials, and they also intersect in the way in which they enter into aspectual composition with (Strictly) Incremental Theme arguments and influence their quantificational and referential properties (see, e.g., Filip, 1993, 1999).

To summarize, Slavic verb prefixes do not uniformly and consistently in all their occurrences mark perfective aspect of verbs, while they derive perfective verbs, such prefixed perfective verbs do not uniformly denote telic predicates, where telicity is interpreted in terms of a single semantic notion like culmination implication (e.g., Kratzer, 2004), quantity (Borer, 2005), quantization Krifka (1987, 1998) or some other single notion like result, completion and the like. If telicity in this sense is taken to characterize the semantics of Slavic perfectivity, then Slavic prefixes fail to carry this alleged 'perfective' meaning as a whole class, consistently in all their uses. As has been shown in this section, the reason for this has to do with the diverse, rich, and often unpredictable contributions of prefixes

to the meaning of particular perfective (classes of) verbs. In short, this amounts to the refutation of any theory of Slavic prefixes and perfective aspect that subscribes to some version of (36) and (37). We have also seen that such a theory is ill-equipped to predict when particular uses of prefixes on perfective verbs have effects on the quantificational and referential properties of nominal arguments, and when not.

In the next section, an account of Slavic prefixes and its relation to perfectivity will be offered which tries to do justice to both the varied, rich and often highly idiosyncratic semantic contributions of verb prefixes to the meaning of perfective verbs and sentences headed by them, as well as to the uniformity of perfective verbs as a coherent grammatical class that is separate from that of imperfective verbs.

## 6. Slavic Verb Prefixes, Perfectivity and Maximalization

Perfectivity as a grammatical feature of Slavic verbs is not a feature carried by their verb prefixes. Among the prima facie reasons, which have been touched on in the previous sections, are the following ones. The presence of a verb prefix on a verb is neither a necessary nor a sufficient condition for that verb to be perfective. Neither do Slavic verb prefixes uniformly carry the invariant meaning of perfectivity of Slavic (prefixed) perfective verbs (in whichever way it might be characterized, e.g., as culmination entailment (e.g., Kratzer, 2004), quantity(-telicity) (Borer, 2005), quantization (Krifka, 1987, 1992), i.a., as their grammatically relevant semantic feature. This is due to the fact that Slavic verb prefixes introduce lexical changes that are often not compositional (that is, not predictable), result from the often idiosyncratic interactions with verb stems to which they are added, and their interactions with verb stems of different lexical semantic classes are so varied that a uniform analysis of all their varied uses in terms of a single feature, no matter how abstracted, is implausible, if that feature should still have any meaningful content. There are no lexically empty prefixes, no 'perfective prefixes' dedicated to only marking perfectivity, the changes that are induced by Slavic verb prefixation are typical of derivational rather than inflectional morphology. They often induce changes in argument structure, and their uses exhibit a number of idiosyncratic morphological, syntactic, and semantic properties.

All of the above precludes the treatment of Slavic verb prefixes as grammatical markers of perfective aspect, all uniformly carrying a single feature posited for the interpretation of the perfective operator. At the same time, despite the lexical semantic diversity of Slavic prefixes, there is a denotational and functional unity exhibited by perfective verbs they form that must be accounted for. Building on the previous proposals by Filip and Rothstein (2005) and Filip (2008), it can be captured by means of the maximalization operator $\text{MAX}_\text{e}$.

### *6.1. The Maximalization Operator* $\text{MAX}_\text{e}$

Perfectivity as a grammatical feature of Slavic verbs that has no dedicated marker(s), as has been argued here. Rather it is best viewed as a grammatical feature of fully formed perfective verbs taken as lexical items, which introduce a phonologically null perfective operator.[29] In Filip (1993, 1999, 2000), the Slavic null perfective operator corresponds to the TOTALITY operator. Subsequently it was refined in terms of the generalized MAXIMALIZATION ($\text{MAX}_\text{e}$) operator in Filip and Rothstein (2005) and Filip (2008, 2017). $\text{MAX}_\text{e}$ is taken to capture the semantics of perfective forms not only in Slavic languages where it is phonologically null, but also in other languages with the grammaticalized perfective/imperfective distinction, and where it may be overt (e.g., as in French, where it is realized by the passé simple suffixes, which function as aspect-tense operators).

(67) The maximalization operator $\text{MAX}_\text{e}$ is a monadic operator, such that $\text{MAX}_\text{e}(\text{P}) \subset \text{P}$, which maps a partially ordered set (poset) of eventuality stages in the denotation of P onto its (unique) maximal stage at the reference time $t_\text{r}$ and $\text{world}_\text{w}$.

https://doi.org/10.3390/languages11010005

There is a limited variation in how the maximal stage requirement of the MAX$_e$ operator is satisfied: namely, the poset of stages of eventualities in the denotation of P ceases to develop

(i) At the upper bound of described eventualities lexically specified by P (i.e., P is telic, and lexically specifies a culmination condition); or

(ii) At some contextually determined termination stage, which
(a) is prior to such an upper bound (e.g., in the case of so-called 'non-culminating accomplishments');
(b) is inferred from P and its context of use, if P fails to lexically specify an upper bound of eventualities in its denotation (i.e., P fails to lexically specify a culmination condition, is not inherently telic).

'Stage' is used in the sense Landman (2004), and defined as follows:
If $e_1$ and $e_2$ are eventualities and $e_1$ is a stage of $e_2$ then

- 'Part of': $e_1 \leq e_2$, $e_1$ is part of $e_2$ (and hence $\tau(e_1) \subseteq \tau(e_2)$).
- Cross-temporal identity: $e_1$ and $e_2$ share the same essence: they count intuitively as the same event or process at different times.
- Kineisis: $e_1$ and $e_2$ are qualitatively distinguishable, $e_1$ is an earlier version of $e_2$, $e_1$ grows into $e_2$.

Intuitively, MAX$_e$ comes close to the ideas that motivated the characterization of the invariant meaning of perfectivity in terms of 'totality' of a situation viewed as a single whole (see Jakobson, 1932; Bondarko & Bulanin, 1967; Bondarko, 1971; Avilova, 1976, among others). The meaning of perfective forms that entail completion, culmination with respect to some (possibly lexically specified) culmination condition involving some endpoint, result, goal, and the like can be seen as a special case arising from the application of MAX$_e$ to base predicates that are telic in so far as they characterize a culmination condition (see 46), and covered by (67)/(i).

### *6.2. The Input and Basic Workings of* MAX$_e$

The input P of MAX$_e$ is an uninflected base predicate with all its argument positions filled by constants or variables: a base EVENTUALITY DESCRIPTION that is embedded below the operators of grammatical aspect and tense (see (15), and also, e.g., De Swart, 1998; Zucchi, 1999). As is common in event semantics, such predicates are classified into one of the three main aspectual classes (also known as situation types in the sense of Smith, 1991, or Aktionsart classes), namely STATES, PROCESSES or EVENTS (see (34) above). The level of EVENTUALITY DESCRIPTIONS corresponds to syntactic structures at the level of inner aspect (see (15) above).

The MAX$_e$(P) is the largest, or maximal, member of the set of partially ordered eventuality stages of P at a given world and time. The maximal stage is made up of all its distinguishable and ordered stages of various sizes that count as different stages satisfying the same maximal predicate MAX$_e$(P) at different times, but none is greater than the largest stage picked out by the MAX$_e$(P) at a give world/time. Hence, the most fundamental requirement for the application of MAX$_e$, for any maximalization operator for that matter, is that it respects some ordering criterion.

The main burden of the analysis of perfectivity, as proposed here, is then on identifying the requisite ordering criterion with respect to which distinguishable stages of various sizes in the denotation of its input P can be partially ordered, and from which MAX$_e$ picks out the largest unique stage at a given time/world. In the simplest case, the source for the requisite ordering criterion comes from the gradual changes in the extent of concrete objects or stuff that they undergo during the course of eventualities to which they are related.

This idea is compatible with Davidson's (1969) proposal that events are often described and identified in terms of changes in concrete objects or stuff to which they are related. (Davidson's 'events' comprise all dynamic eventualities.) The most straightforward way of monitoring changes in concrete objects or stuff is in terms of their increasing or decreasing extent, weight, height, volume, or length, for instance. Take an event of eating of two apples. It consists of qualitatively distinguishable stages (in the sense of Landman, 2004) which can be identified and ordered by changes in the quantity/extent of the two apples as they are gradually consumed. For example, the stage of eating of a half of an apple $e_1$ is an earlier version of, or 'grows into', a larger stage of eating of one whole apple $e_2$, and both are two among other stages $e_n$ of the same (whole) event of eating of two apples at different times. We obtain an ordering of stages with 'smaller' stages constituting stages of 'larger' ones of the same event of eating of two apples.

Generally, extent, weight, volume, or length are examples of dimensions that objects and stuff may have and along which they can be measured. Measuring of objects and stuff is assigning them an overall value on a scale, which is calibrated in terms of units that are standard for quantifying one of their dimensions. For example, weight can be measured in terms of pound units, for instance, volume in terms of liter units, length in terms of miles, and temperature in terms of degree Celsius. Natural kinds like apples are associated with concepts that provide a criterion for individuation for what is one countable member, a natural unit-size of one member of that kind, which is clearly disjoint from other members of the same kind (see also 'natural unit' function NU in Krifka, 1989). From a measure of some dimension of objects and stuff, we can derive measures over eventualities in the denotation of verb predicates to which such objects and stuff are related (Krifka, 1989), and also, as I propose, the ordering criterion with respect to which their stages can be partially ordered so that they satisfy the input requirement of $\text{MAX}_e$.

In the uninflected, base predicate *eat two apples* the source of this ordering is the scale associated with *two apples* and the lexical semantics of the verb *eat*.

*Two apples* is associated with a scale of apples, because the weak cardinal quantifier *two* is lexically associated with a SCALE, just like other quantifiers and various expressions of quantity.[30] The verb *eat* belongs to a coherent lexical semantic class of verbs that have as a part of their lexical meaning the entailment that there exist one-to-one mappings (homomorphism) between the part structure of an event in its denotation and the part structure of a referent of its Strictly Incremental Theme argument (see Krifka, 1987, 1992, 1998; D. Dowty, 1991; Filip, 1993, Filip, 1999).

The mappings accomplish a double function. First, they ensure that the part structure of the scale associated with *two apples*, the Strictly Incremental Theme in *eat two apples*, corresponds to the part of structure of an event denoted by *eat two apples*, as Filip (1993, 2008, 2017) and Filip and Rothstein (2005) propose. Hence, each part of the quantity of two apples, which is ordered on a scale based on its size with respect to its other parts, corresponds to that part of an event (of eating two apples) during which it is eaten. This generates a poset of distinguishable event stages of various sizes that count as different stages satisfying an event in the denotation of predicate *eat two apples* at different times.

Second, given that *two apples* in *eat two apples* is the Strictly Incremental Theme and quantized, it introduces a scale and an upper bound with respect to which we can determine what must be the case if an event in the denotation of *eat two apples* culminates, if an event in its denotation counts as one maximal event at a given reference time and world, which is what makes *eat two apples* telic (see (46)). Hence, aspectual composition of *eat* with *two apples* straightforwardly predicts that *eat two apples* is quantized/telic (see Krifka, 1987, 1992, 1998; D. Dowty, 1991).

Now, the result of aspectual composition is the uninflected telic/quantized predicate *eat two apples*, which on its own does not denote maximal only (completed) events, i.e., events of both apples having been eaten, which corresponds to what is taken to be the interpretation of perfective aspect. Rather, it denotes a poset of distinguishable event stages of various sizes that count as different non-maximal (non-culminated) stages satisfying the same predicate *eat two apples* as well as the maximal (culminated) stage, when both the apples are eaten. It is a poset of distinguishable ordered stages in the denotation of *eat two apples* that sanctions the application of the maximalization operator $\text{MAX}_e$ to it. This type of denotation of a base uninflected predicate is compatible with arguments made by Parsons (1990) and Zucchi (1999) that base uninflected accomplishment (telic) predicates are sets of both culminated events (maximal events in terms used here) and non-culminated (non-maximal) events.

It is $\text{MAX}_e$ that constrains the interpretation of *eat two apples* to its maximal stage at a given world/time, which is made up of all its distinguishable and ordered stages of various sizes that count as different stages satisfying the same maximal predicate $\text{MAX}_e(P)$ at different times, but none is greater than the largest stage picked out by $\text{MAX}_e(P)$ at a given world/time, which coincides with the stage at which both apples have been consumed. In English, simple past tense sentences are often taken to introduce a perfective operator (e.g., Parsons, 1990; Landman, 1992, i.a.). So in English, the $\text{MAX}_e$ could be thought of as a phonologically null operator which is introduced in past tense sentences headed by the simple (non-progressive) verb form, as in (68b) *Sam ate two apples*, with the effect of yielding the maximal event at a given reference time and world. The same base uninflected telic/quantized predicate (68a) *eat two apples* can be embedded under the scope of the progressive operator, as in (68c) which restricts its denotation to a (non-final, non-maximal) stage at a given world/time.

(68) a. *eat two apples*
uninflected, base telic predicate
Denotation: Distinguishable, ordered stages of both maximal events of eating of two apples and non-maximal stages during which only proper parts of the whole quantity of two apples are eaten.

b. *Sam ate two apples*.
$\text{MAX}_e$ (eat two apples)
$\approx$ the maximalization requirement
Denotation: Maximal events of eating of two apples.

c. *Sam was eating two apples*.
PROG (eat two apples)
Denotation: Reference to a non-maximal stage of an event of eating of two apples.

Having introduced the basic workings of the $\text{MAX}_e$ operator, let us now turn to its raison d'être, why it is needed in the first place. It has to do with an attempt to provide a solution to two puzzles in the domain of aspect (see Filip & Rothstein, 2005 and Filip, 2008, 2017, also based on some proposals in Filip, 2000), that is, to improve on some problems related to the original proposals of the mereological accounts of aspectual composition in Krifka (1987, 1992, 1998) and D. Dowty (1991).

One concerns the wrong prediction made by their original accounts of aspectual composition. There are nominal predicates that on their own fail to be quantized, e.g., indefinite NPs/DPs that contain a weak quantifier or a vague measure expression like *a twig, a sequence (of numbers), at least/at most two apples, a lot of brandy, only a little brandy, a small/large quantity of brandy*, but in aspectual composition when used as (Strictly) Incremental Themes,

they still yield complex verbal predicates that behave like quantized/telic predicates. This is confirmed by the observation that they are straightforwardly compatible with time-span adverbials that test for telicity/quantization of complex predicates they build; e.g., *write a sequence of numbers in five minutes/?for five minutes*, *drink a (large/small) quantity of brandy in ten minutes/?for ten minutes* (see extensive discussions and solutions to this problem proposed in Zucchi & White, 1996, 2001, i.a.).

While, for instance, *drink a small quantity of brandy* on its own fails to be quantized, it satisfies the input requirement of the $\text{MAX}_{\text{e}}$ operator, given that its Strictly Incremental Theme argument is a measure phrase *a small quantity of brandy* which generates a scale of quantities of brandy of different sizes, which, via aspectual composition, generates a poset of stages of events in the denotation of *drink a small quantity of brandy*. The phonologically null $\text{MAX}_{\text{e}}$ operator constrains its denotation to the largest or maximal stage at some reference time and world at which the denoted event ceases to develop. This amounts to a contextually restricted telic/quantized interpretation of the predicate. For instance, *drink a small quantity of brandy* denotes the largest/maximal unique stage of drinking a small quantity of brandy at a given world/time, which makes it quantized/telic with respect to that world/time pair. This then straightforwardly motivates its compatibility with *in ten minutes*, which can only apply to telic predicates. The details of this analysis are presented in Filip and Rothstein (2005), Filip (2008) and Filip (2008, 2017) which rely on derived measure functions on eventualities (Krifka, 1989), enriched with scalar semantics Filip (1993, 2008), and the lexical semantics of verbs.

The other puzzle is the quantization (telic) puzzle raised by Slavic perfective verbs failing to denote quantized (and telic) predicates, contrary to the common predictions about the semantics of perfective verbs (see Filip, 1992, 2000). Its source lies in their prefixes that have meanings akin to vague measure expressions or weak quantifiers. This puzzle was addressed above, using examples in (50), (65b) or (65a), and it will be revisited in connection with the $\text{MAX}_{\text{e}}(\text{P})$ operator and Slavic perfectivity in (Section 6.4).

### *6.3. The Output of* $\text{MAX}_{\text{e}}$

The denotation of the $\text{MAX}_{\text{e}}(\text{P})$ is the largest, or maximal, unique member of the set of partially ordered P-stages at a given world and time, out of a set of event stages that satisfy the property described by P. This means that $\text{MAX}_{\text{e}}(\text{P})$ is quantized, specifically, a contextually restricted maximally quantized set. Its denotation parallels the denotation of the definite article like *the* in English, in the nominal domain. The meaning of *the* can be defined in terms of a 'supremum' operator that can be applied to quantized or cumulative predicates:

(69) $[\![\textit{the } P]\!] = \text{sup}([\![\text{P}]\!])$ In words: 'the greatest or maximal member in $[\![P]\!]$'
the greatest or maximal member among the entities that satisfy *P* in the relevant situation, at a given world and time, if there is one (else, undefined) (Sharvy, 1980; Link, 1983, following Montague, 1973).
Examples:
*the water* = $\text{sup}([\![\textit{water}]\!])$ the largest quantity of water in the domain
*the apples* = $\text{sup}([\![\textit{apples}]\!])$ the largest plurality of apples in the domain
*the apple* = $\text{sup}([\![\textit{apple}]\!])$ the unique apple, the only apple in the domain

Technically, the supremum is the least upper bound of a set, defined as a member of that set such that no member of that set exceeds it. Whenever a supremum exists, its value is unique. The supremum operation gives the same value as the iota-operator $\iota$, which also selects the largest element of a set (assuming that set has one), which is one common way of representing the meaning of the definite article *the* (Sharvy, 1980):

(70) a. $[\![the\ P]\!] = \iota\,([\![P]\!])$
b. $[\![the]\!] = \lambda P.\iota x[P(x)]$
c. iota ($\iota$): $P\langle e,t\rangle \rightarrow \iota x P(x)_{\langle e\rangle}$, where *the* is interpreted at type: $\langle e,t\rangle \rightarrow \langle e\rangle$ or $\langle\langle e,t\rangle,e\rangle$

How $\text{MAX}_e$ operator might provide possible solutions to the challenges posed by the Slavic quantization puzzle will be addressed in the next section. It will conclude with sketching its application to the problem posed to the original mereological account of aspectual composition in Krifka–Dowty framework.

### *6.4. The Relation Between* $\text{MAX}_e$ *and Slavic Verb Prefixes*

The claim that Slavic verb prefixes are not markers of perfective aspect, that they do not carry a uniform function for the interpretation of perfective aspect, does not mean that there is no relation between verb prefixes and the perfective operator introduced by perfective verbs (*pace* Borer 2005, p. 159).[31] There is a two-fold relation between the phonologically null $\text{MAX}_e$, which corresponds to the shared meaning of perfective forms, and meaning(s)/use(s) of Slavic verb prefixes. The meaning that a given prefix assumes in a given prefixed stem contributes to (i) specifying the ordering criterion for the poset of stages in the denotation of a P of which it is a part, and which is a prerequisite for the application of $\text{MAX}_e$, and (ii) modulating the variation in how the maximal stage requirement of $\text{MAX}_e(P)$ will be satisfied in a given context, i.e., whether its output will be (67)/(i) or (ii).

The following addresses these points in some detail. As mentioned above, Slavic verb prefixes function as modifiers mapping eventuality descriptions of one aspectual class into possibly another. These mappings may also add meaning components of measurement, quantity or weak quantification,[32] or upper/lower bounds of the relevant associated scales, which influence the referential and quantificational properties of nominal arguments and interact with the quantificational structure of sentences. Some examples were discussed in connection with the Russian prefixes *na-, do-, pri-, and po-* in Section 5.2.2. Such meaning components naturally serve as the source for the requisite ordering criterion for the application of $\text{MAX}_e$.

As Filip (1992, 1996) proposes, also based on suggestions in Partee (1995), from the point of view of the expression of quantification and measurement in natural languages, Slavic verb prefixes have common uses related to measurement, quantity and weak quantification which can be treated as *lexical A(dverbial)-quantifiers* expressed on verbs, i.e., they are V-operators that qualify as a subclass of A-quantifiers, besides syntactic A-quantifiers that function as VP- or S-operators. A-quantifiers are opposed to *D(eterminer)-quantifiers* within a DP (see Partee et al., 1987; Bach et al., 1995, i.a.). As lexical A-quantifiers, Slavic verb prefixes function as verb-internal operators that may influence quantificational and referential properties of nominal arguments and have effects on the quantificational structure of sentences. We may identify the following prominent classes, among others (Filip, 1996):

(71) **Meanings/uses of Slavic verb prefixes as lexical (A-)quantifiers** (Filip, 1992, 1996, 2000, 2005a)
Three main types of meanings:

- **Vague measure/weak quantifier**: e.g., a relatively large/small quantity, e.g., 'a few', 'much', 'many' (on its weak/cardinal interpretation)[33], 'a lot of'), which can be analyzed in terms of a generalized extensive measure function operating over different measurable/quantifiable dimensions of eventualities and referents of their ((Strictly) Incremental) Theme argument (see Filip, 2005a).
- **Exhaustivity**: akin to, e.g., 'all', 'totality (of)', 'whole' (see Filip, 2004, 2005b, and elsewhere).

https://doi.org/10.3390/languages11010005

- **Distributivity/collectivity**: Distributivity represented in terms of mereology of eventualities, and not reduced to universal quantification over individuals[34]; distributively interpreted predicates involve simultaneous quantification over the members of a group and the parts of an eventuality (see Filip & Carlson, 2001).

The 'exhaustivity' function is particularly clear with Slavic verb prefixes that are lexically associated with upper bounds of closed scales, calibrated with respect to measurable properties of objects, which are related to events denoted by prefixed verb stems they form. For instance, as we have seen, the Russian terminative prefix *do-* in (42) and (41) lexicalizes the upper bound (final stage) of events of writing of *Ariadne*, which here forms both the perfective verb *dopisat'*'to finish writing', and the prefixed secondary imperfective verb *dopisyvat'* 'to (be) finish(ing) writing'. Arguably, *do-* here might be seen as related to the directional Goal-oriented Russian preposition *do* '(in)to', 'at' (as in, e.g., *do konca* [lit.: (in)to end] 'until the end', Russian) to which it is diachronically related, by the mechanism of polysemy arising from the metaphorical extension of meaning. An event of writing of *Ariadne* is 'exhausted', i.e., necessarily ends when the largest/maximal part of the referent of *Ariadne* comes into existence (corresponding to the upper bound of the scale associated with it). Given the incremental relation entailed by the stem 'write' of *dopisat'*(pf) 'to finish writing', and *dopisyvat'* (ipf) 'to (be) finish(ing) writing', via the homomorphic object-event mappings this coincides with the upper bound of largest/maximal writing stage among the ordered stages in the denotation of 'finish writing of *Ariadne*', a metaphorical 'Goal' stage of sorts, and the largest/maximal part of the referent of *Ariadne*.

Used as vague measurement or weak quantificational notions, Slavic verb prefixes map predicates of PROCESSES or STATES into their corresponding bounded portions, intuitively speaking. To take a concrete example, let us again consider the prefixes *na-* and *po-* in (65b) and (65a). In traditional terms, their use here is categorized as falling under the (ac)cumulative and attenuative (or delimitative) Aktionsart, respectively. Their effect on the interpretation of the bare mass argument 'brandy' approximately amounts to 'a (relatively) large/small measure/quantity of brandy', or a vague weak quantifier like 'much'/'little'. The prefix *na-* may also here provide additional modifications having to do with a relatively high degree of satisfaction ('to one's heart content') or displeasure, or an effort with/in performing the action denoted by the verb, while *po-* a possibly low effort, and the like.

Based on such traditional characterizations, Filip (2005a) proposes that Slavic verb prefixes that are used with vague measurement or quantity meanings can be analyzed as expressing vague context-sensitive extensive or intensive measure functions (in the sense of Krifka, 1995). For instance, in (65b) and (65a) the prefixes *na-* and *po-* can be analyzed as expressing a context-sensitive extensive measure function over the stuff denoted by the Strictly Incremental Theme argument ('brandy') of the prefixed perfective verbs they form. In the semantic composition of a sentence, the prefixes directly combine with the Strictly Incremental Theme argument, yielding an output with a meaning akin to a vague measure (pseudo-partitive) phrase. The interpretation of *na-* + *konjačka* in (65b) amounts to approximately 'the measure of $x$ that exceeds some contextually determined threshold' and the interpretation of *po-* + *konjačka/konjačok* in (65a) to 'the measure of $x$ that falls short of or is equal to some contextually determined (relatively low) threshold'. This parallels the use of extensive measure functions like *pound* (see Krifka, 1989) or *a large/small quantity* that are applied to cumulative predicates (mass and bare plural) and yield predicates expressed by measure (pseudo-partitive) NPs, which are quantized like *a pound of sugar/apples*, or may have a contextually determined quantized reading like *a large/small quantity of sugar/apples*.

Specifically, in the compositional structure of (65b) and (65a), the combination of the prefixes *na-* and *po-* with the Strictly Incremental Theme 'brandy' has the semantics that can be assimilated to that of measure (pseudo-partitive) NPs in the nominal domain. Assuming

that such measure phrases are lexically associated with a SCALE, and the imperfective stem of *pit'* 'to (be) drink(ing)' is a strictly incremental relation (i.e., entails one-to-one mappings between eventualities and objects), the combination of *na-* + *konjačka* in (65b) and *po-* + *konjačka/konjačok* in (65a) are composed with the imperfective stem via aspectual composition to yield the complex predicates 'events of drinking relative to the amount of a (relatively) large measure/quantity of brandy' and 'events of drinking relative to the amount of a (relatively) small measure/quantity of brandy', respectively. Moreover, the one-to-one mappings entailed by the incremental verb stem also ensure that their part structure stands in a one-to-one relation to the degrees of the scale lexically associated with their containing measure phrases, which generates a partially ordered set (poset) of stages in their denotation. This then satisfies the input requirement of $\text{MAX}_e$. A detailed justification of this analysis of Russian prefixes, and its formal implementation within mereological semantics enriched with scalar-based representation is given in Filip (2005a).[35] What matters here is that we can derive the ordering criterion for the application of $\text{MAX}_e$ from the vague measurement meaning of a verb prefix. Intuitively, the relatively large or small portion of brandy provides a measure and the corresponding associated scale with respect to which the 'portions' of described drinking events and their stages can be ordered.

This brings me to the second link between Slavic verb prefixes and $\text{MAX}_e$, which concerns the variation in how the maximal stage requirement of $\text{MAX}_e(\text{P})$ is satisfied. Generally, this variation depends on the eventuality type of its input base predicate P. As stated in (67), one of the options is that the poset of stages in the denotation of P ceases to develop at the upper bound of described eventualities lexically specified by P, that is, P lexically specifies a culmination condition, and so is telic. Slavic verb prefixes may contribute to the lexical specification of a culmination condition by being lexically associated with a scale which provides the requisite ordering criterion and its upper bound with respect to which it can be determined what must be the case if events in the denotation of P culminate, or what it means for events to count as maximal events at a given reference time and world.

A good example is the Russian terminative prefix *do-* in (42) and (41). The culmination condition, namely the maximal stage of denoted events at which the referent of *Ariadne* comes into existence in its entirety, is shared by the imperfective surface predicate *dopisyvat'* '*Ariadne*' (ipfv) 'to (be) finish(ing) writing *Ariadne*' and its perfective counterpart *dopisat'* '*Ariadne*' (pfv) 'to finish writing *Ariadne*'; both share the same base predicate (given in (44)). This predicate is unambiguously telic (in the sense of Garey, 1957, or accomplishment-denoting in the sense of Vendler, 1957, see (46) above). The base predicate lexically specifies the culmination condition, but not the culmination/maximalization requirement. It has both maximal (culminated) and non-maximal (non-culminated) events in its denotation (as has been argued above in connection with the imperfective paradox/partitive puzzle). It is the perfective aspect of the fully formed verb, e.g., the infinitive *dopisat'* (pfv) and its finite forms, that introduces $\text{MAX}_e$ adding the maximal stage requirement to the meaning of (44), hence constraining its denotation to only the maximal (culminated) event, which is the unique largest event at a given time/world.

The maximal stage requirement of $\text{MAX}_e(\text{P})$ can also be satisfied if the poset of stages in the denotation of P ceases to develop at some contextually determined termination stage, which is inferred from P and its context of use. In Slavic languages, this is the case with prefixed perfective verbs that give rise to the quantization (telicity) puzzle (Filip, 1992, 2000). Such perfective verbs are formed with prefixes expressing vague measure functions or weak quantificational notions, as illustrated by the Russian verb *napilsja* in (65b) and *popil* in (65a), as has been explained above. In a nutshell, on their own, they fail to be quantized, and also telic, because they fail to lexically specify a determinate upper bound, endpoint,

result, and the like, i.e., what is referred to as the culmination condition that characterizes telic predicates (46). Nonetheless, they are grammatically perfective, because they satisfy most tests for Slavic perfectivity, and in this respect pattern with perfective predicates that are both quantized and telic. However, the prefixes that contribute a vague measurement or quantificational meaning provide a criterion on the ordering of the stages of the denotations of perfective verbs they form. This satisfies the input requirement of $\text{MAX}_{\text{e}}$, which is introduced by the perfective aspect of such fully formed perfective verbs. $\text{MAX}_{\text{e}}$ then picks the largest unique member of the set of partially ordered stages out of this set at a given reference time and world. This means that the perfective verbs *napilsja* in (65b) and *popil* in (65a) have a contextually determined quantized, and hence also telic, interpretation: i.e., none of the non-maximal stages in the denotation of *napilsja* and *popil* can fall under *napilsja* and *popil* at the same reference time and world. Here, the maximal stage is the stage at which the partially ordered P-stages cease to develop further at a given reference time and world, rather than the culmination stage beyond which there is no possible larger stage of the same P-event.

Interestingly, however, perfective verbs (and sentences) formed with prefixes that have vague measurement or quantificational uses may seem to be at least slightly odd with both time-span adverbials which test for perfectivity and durative adverbials which test for imperfectivity. For instance, there is something odd about the Czech example *Zamíchal* (pfv) *lžící polévku #pět minut/#za pět minut* 'He stirred (the/some) soup a little for 5 min/in 5 min', where the reading of the time-span adverbial that is relevant for the perfectivity test measures the extent of the stirring event, not the time before its onset. The prefix *za-* here adds the modification of a relatively short time and/or a low degree of effort, and the like.[36]

## 7. Conclusions

Any theory of Slavic aspect systems must provide an adequate analysis of verb prefixes. When evaluating different theories of Slavic aspect systems, the analysis of their verb prefixes constitutes an ideal testing ground for their adequacy. This is because the bulk of perfective verbs is formed by means of prefixes, and not just one, but also two or more prefixes may occur on the same verb, while prefixes predictably derive perfective verbs from either imperfective bases (primary imperfective) or perfective bases (primary or derived perfective), they induce lexical meaning changes that go beyond the perfective meaning change, and such lexical changes are often non-compositional, and may also induce argument structure changes, and determine the referential and quantificational properties of nominal arguments, and quantificational structure of sentences. Moreover, the imperfectivizing suffix that derives secondary imperfective verbs from perfective stems (primary or derived) can co-occur with one or more prefixes on the same imperfective verb. Minimally, these basic data points must be adequately accounted for.

Slavic verb prefixes force us to address the relation of the lexical meaning to grammatical meaning, and ultimately the status of the Slavic perfective and imperfective categories with respect to the categories of the TMA system. As I argue here, Slavic verb prefixes are not grammatical markers of perfective aspect or telicity. It makes no sense to speak of Slavic 'perfective prefixes', or 'telic prefixes', and treat them as grammatical markers on a par with bona fide grammatical markers of the TMA system along with the markers of tense in English, for instance (*pace* Borer, 2005). Slavic verb prefixes exhibit morphological idiosyncrasy and idiosyncratic meaning changes, which are taken to characterize (lexical-)derivational morphology. There is, however, a unity behind this variety, namely, perfective verbs as a whole class, both prefixed and prefixless, share a number of syntactic and semantic properties, which motivates the status of Slavic perfectivity as a grammatical category in the TMA system.

https://doi.org/10.3390/languages11010005

Moreover, as I argue, while Slavic perfectivity or telicity is not predictably linked to verb prefixes, the proper function of Slavic verb prefixes with respect to perfectivity lies in their contribution to the semantic conditions for the application of the perfective operator, which, as I propose, can be thought of in terms of the phonologically null maximalization operator $\text{MAX}_e$. Typically, they do so by virtue of having common meanings/uses that can be assimilated to vague measure functions, quantifiers, or exhaustivity operators, all of which are lexically associated with scales. This idea is motivated by the observation that Slavic verb prefixes qua such common uses can be analyzed as word-internal operators, and specifically as lexical A-quantifiers in the sense of cross-linguistic studies on quantification in natural language (see Filip, 1992, 1996, i.a., following some suggestions in Bach et al., 1995, and Partee, 1995). This view of Slavic verb prefixes and their relation to perfectivity supports the claims made independently elsewhere (e.g., Dahl, 2006) that Slavic aspect systems are predominantly of a lexical-derivational nature, and as such belong to the peripheral categories of the TMA system.

**Funding:** This research received no external funding.

**Institutional Review Board Statement:** Not applicable.

**Informed Consent Statement:** Not applicable.

**Data Availability Statement:** No new data were created or analyzed in this study.

**Conflicts of Interest:** The author declares no conflict of interest.

## Abbreviations

| | | | |
|---|---|---|---|
| 1 | first person | NEG | negation |
| 2 | second person | NOM | nominative |
| 3 | third person | PFV | perfective |
| ACC | accusative | PL | plural |
| AUX | auxiliary | PREF | prefix |
| DAT | dative | PRS | present tense |
| GEN | generic | PST | past tense |
| INF | infinitive | REFL | reflexive |
| IPFV | imperfective | SG | singular |

## Notes

1 Similar related suggestions that Slavic aspect systems consist of of related derivational patterns can be found in (Wiemer & Seržant, 2017; or Janda, 2007).

2 See, e.g., (Grønn, 2026), and for the future time reference of perfective present tense verbs in Serbian (Todorović, 2015).

3 See, e.g., (Schoorlemmer, 1995; Babko-Malaya, 2003; Svenonius, 2004; Romanova, 2004; Arsenijević, 2006; Gehrke, 2008; Biskup & Zybatow, 2015; Biskup, 2019; Klimek-Jankowska & Błaszczak, 2022).

4 For instance, a list of Russian primary perfectives is given in Maslov (1956, pp. 183–184) and (Isačenko, 1962: §204, pp. 352–355).

5 The common Slavic origin is taken to be the sequence **-nVn-*, see Wiemer and Seržant (2017).

6 According to Biskup (2023), the semelfactive suffix selects a root with a punctual or instantaneous property and derives a perfective stem; the combination of the root with a theme vowel leads to the derivation of the corresponding imperfective stem.

7 The Slavic imperfectivizing suffix is realized in several allomorphic variants in each Slavic language. In Czech, for instance, according to (Petr, 1986), they are *-(v)a-*, *-ova-*, and *-(j)e-*.

8 Some examples, among others: https://ru.wiktionary.org/wiki/, https://kartaslov.ru/, https://sinonim.org/t/, https://thesaurus.altervista.org/dict/ru/ (all accessed on 9 December 2024).

9 For instance, in Czech, there are cases in which both the prefixation input and output are imperfective, e.g., *nocovat* (ipfv) 'to stay overnight' → *ponocovat* (ipfv) 'to stay up at night'. The suffix here is used to derive a denominal imperfective verb; it does not derive a secondary imperfective verb from a perfective stem, unlike the imperfectivizing suffix.

[10] There are no 'empty' prefixes, according to (Isačenko, 1962, p. 362), and prefixation makes no contribution to the formation of true aspectual pairs, see (Isačenko, 1962, p. 363).

[11] An anonymous reviewer pointed out that similar observations about Slavic verb prefixes having uses in which their meaning overlaps with a semantic component that is inherent to a simplex imperfective stem to which they are attached were made by Vey (1952) and Schooneveld (1958). They thus merely appear to be lexically empty, when in fact they make a lexical contribution to the derived perfective verb.

[12] In the following example, the accumulative prefix *na-* co-occurs with the quantifier *málo* meaning approximately 'a little', 'a small quantity': *Dnes jsem něco málo napekl: Pšenično-žitný Ciabatta, Croissant, Šnek s vanilkovým krémem a kousky čokolády* 'Today I did a bit of/some baking: Wheat-rye Ciabatta, Croissant, Snail [a kind of pastry] with vanilla cream and chocolate pieces.' This is used for a special rhetorical effect, namely, an ironic understatement, given that the accompanying photograph shows a decent amount of baked goods, and also baked goods that require some effort to bake. https://www.facebook.com/story.php/?story_fbid=909555057859901&id=100064162444001&_rdr (retrieved 9 December 2024).

[13] http://archiv.neviditelnypes.lidovky.cz/clanky/2003/11/33739_10_0_0.html (accessed on 9 December 2024).

[14] For instance, according to van Hout (2008), verb prefixes in Russian and Polish are 'perfective prefixes' that derive perfective verbs make the verbal predicates expressed by them telic.

[15] On Slabakova's account of verb prefixes in Bulgarian and other Slavic languages, all prefixes entail the feature "[+complete]" (Slabakova, 1997, p. 104), apart from possibly other idiosyncratic lexical semantic components.

[16] Borer (2005), for instance, and as mentioned above, subscribes to (19) by proposing that Slavic verb prefixes are grammatical markers of perfectivity, on par with English inflectional suffixes like the past tense suffix *-ed* or plural suffix *–s*, but, at the same time, mentions that "[s]hould it turn out, however, that empirical considerations strongly favor a view of perfective marking as affixal in nature [referring to the proposals in (Filip, 1992, 2000) HF], it would not crucially affect issues of (a)telicity and the assignment of range to [$_{\text{ASPQ}}$ <e>$_{\#}$]" Borer (2005, p. 159, Chapter 15, Volume II), i.e., it would still be compatible with (36).

[17] The contribution of imperfective aspect may be represented by means of the subset or part-of relation '$\subseteq$', i.e., the reference time included within the eventuality time: $\lambda P \lambda t \exists e[P(e) \wedge t \subset \tau(e)]$, which is compatible with a variety of contextually determined meanings, of which the progressive is just one among others.

[18] This example is modeled on the often cited Russian sentence taken from *The Idiot* by Fyodor Dostoyevsky: 'Columbus was happy not when he discovered America, but when he was discovering it.'

*Kolumb byl ščastliv ne togda, kogda* ***otkryl***$^{\text{PFV}}$ *Ameriku, a kogda* ***otkryval***$^{\text{IPFV}}$ *ee*.
K. was happy not then when discover.PST.3SG America but when discover.IPFV.PST.3SG her.

[19] Atelic predicates like *jouer* 'to play' describe situations that "are realized as soon as they begin" (Garey, 1957, p. 106).

[20] In contrast, activity predicates like "running and its kind go on in time in a homogeneous way; any part of the process is of the same nature as the whole" (Vendler, 1957, p. 146).

[21] For a detailed elaboration of this view of telicity, also in connection with the imperfective paradox/partitive puzzle, (see Nadathur & Filip, 2024).

[22] For French, (Garey, 1957, p. 106) illustrates the interaction between (im)perfective aspect (grammatical aspect) and (a)telicity (aspectual classes) by means of the following table (translations are mine):

| gram. aspect | IMPERFECTIVE | PERFECTIVE |
|---|---|---|
| | imparfait | passé composé |
| TELIC | *Pierre arrivait* | *Pierre est arrivé* |
| | 'Peter was arriving (arrived)' | 'Peter (has) arrived' |
| ATELIC | *Pierre jouait* | *Pierre a joué* |
| | 'Peter was playing (played)' | 'Peter (has) played' |

The imperfective aspect (imparfait) when combined with a telic verb like *arriver* refers to a stage of arriving prior to the implicit goal or end, without conveying any commitment as to whether it was attained. The perfective aspect (passé simple) when combined with the same telic verb *arriver* imposes the requirement that this implicit goal or end be reached (Garey, 1957, p. 106). In Vendler (1957), the separation of aspectual classes from grammatical aspect is implicit in his description of the diverse interactions of the progressive aspect (his 'continuous' tense) with activities, on the one hand, and accomplishments and achievements, on the other hand.

[23] Although Kratzer (2004) does not mention it, this class comprises a well-defined lexical semantic class of (strictly) incremental verbs, see D. Dowty (1991), Krifka (1987, 1998), Filip (1993, 1999).

[24] One might also extend the same solution to prefixless perfective verbs with the semelfactive suffix, as in (6), which is plausible, given that the semelfactive suffix co-occurs with one or more overt prefixes on the same perfective verb, as in (7) and (29).

[25] Lexical A-quantifiers, a subclass of adverbial quantifiers, are introduced in Bach et al. (1995) and Partee (1995), and opposed to D-quantifiers, or determiner quantifiers.

[26] With verbs of motion it is a Theme argument, see (Filip, 2005a).

[27] Borer (2005, Chapter 14): "As the crucial property here is quantity, syntactically represented and semantically interpreted in accordance with that syntactic structure, no role whatsoever is played by the lexical semantics of items involved, which is to say, neither the lexical semantics of the verb nor of a direct argument which meets Verkuyl's generalization does or can play a formal role in the determination of telicity. Furthermore, to the extent that we deny the existence of lexical specification concerning argument structure, and in following Tenny's (1987, 1992, 1994) attempt to reduce all argument roles to those of event participants, we must reject any account of telicity which crucially relies on the assignment of some particular role to some particular argument, e.g., theme, regardless of whether it is assigned by the verb or through any other means."

[28] "Secondary imperfectives . . . are in all likelihood akin to the progressive, and as such, are probably species of outer aspect, in the sense of Verkuyl (1972 and subsequent work)" (Borer, 2005, pp. 160–161).

[29] As observed above, the Slavic perfective/imperfective distinction somewhat parallels the mass/count distinction among nouns in languages that have a grammaticized mass/count distinction, as in English or Slavic languages; it is not marked by dedicated markers on nouns, but rather it is a grammatically relevant feature of nouns taken as lexical items, and systematically manifested in their interactions with the plural/singular distinction, as well as with the quantificational and referential properties of DPs/NPs and sentences.

[30] This follows the standard pragmatic inferences based on scalar implicatures, (see Horn 1972; Gazdar 1979; Levinson 1984), which are generally motivated by Grice's first submaxim of Quantity, (Grice, 1975).

[31] Borer (2005, p. 159): "While in Filip (1996) relations between the prefixes *na-*, *u-*, and others and the totality operator associated with the perfective are not pursued in detail, an explicit proposal addressing this issue is made in Filip (2000), where it is suggested that an explicit semantic distinction should be drawn between quantity prefixes and perfectivity. Specifically, Filip (2000) assumes that perfective markers are derivational prefixes which are best described as contributing to the meaning of the verb an extensive measure function, in the sense of Krifka (1998), while she does attribute to the prefixes a quantificational property of some sort, this quantificational property, she claims, is semantically distinct from the semantics of perfectivity, which consists of the presence of an abstract, morphologically unrealized, totality operator. There is no relationship, Filip (2000) claims, between the presence of quantity prefixation and a perfective (i.e., total, telic) interpretation." This adequately summarizes the claims made in Filip (1996, 2000), with one key exception: namely, Filip (1996, 2000) does not claim that there is *no relationship* between the presence of verb prefixes with a measurement meaning/use or a weak quantificational force and the totality operator, which corresponds to the semantics of perfective aspect. Quite on the contrary, Filip argues that the two are related, and their interaction in a given context determines what counts as the 'total' measure or quantity of entities in the denotation of the argument ((Strictly) Incremental Theme) targeted by such verb prefixes.

[32] See Milsark (1977) on the distinction between weak (cardinal) and strong (proportional) quantifiers. Interestingly, Slavic verb prefixes never express strong quantificational notions corresponding to strong quantifiers like *every, each, most*, but only weak ones like *all*.

[33] *Many* has either a cardinal/weak or a proportional/strong interpretation: e.g., *Many men*(proportional) *date many women* (cardinal). 'Many' lexicalized as a word-internal operator, e.g., by means of Slavic verb prefixes like the (ac)cumulative *na-* only has a cardinal/weak reading.

[34] See, e.g., Lasersohn (1990, 1995, 1998).

[35] Kagan (2011), following suggestions in Filip and Rothstein (2005), Filip (2005a, 2008) provides a detailed scale-based analysis of the meanings of a number of Russian verb prefixes.

[36] Kratzer (2004) also observes the oddity of *I played the violin a little bit for 5 months.*

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