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Microvariation in the Slavic secondary imperfective

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ABSTRACT

While secondary imperfectivization (SI) is a prominent phenomenon in Slavic, there is variation in its realization. This study contributes novel cross-Slavic data systematizing our understanding of the distribution and meaning of SI morphology in Macedonian, Bulgarian, Serbian, Slovene, Czech, Polish, Ukrainian, Russian, and Polish. In two exploratory quantitative studies, we (1) show that SI is more productive in Rus, Ukr, Mac, and Bul than in Pol, Cze, Ser, and Slo, and (2) explore semantic conditioning of the variation in productivity of SIs of empty prefixed verbs (they get habitual meaning in Mac and Bul and both single ongoing and habitual readings in Rus and Ukr). We postulate two types of SI morphemes – SI (equally productive across Slavic) and SI-hab (productive only in Bul and Mac). At the formal level, we posit an agreement operation involving a parasitic habitual feature with different behaviors in the tested languages.

KEYWORDS secondary imperfective · aspectual prefixes · variation · morphosyntax

1 INTRODUCTION

The status of aspectual morphemes in Slavic is a topic of ongoing debate in the literature. Almost all verbs (including infinitives) in Slavic are either perfective or imperfective and most verbs have both perfective and imperfective variants, e.g., *pisać*.IPFV – *napisać*.PFV 'to write'.[1]

Concerning the organization of aspectual morphemes within a verb, the least morphologically complex aspectual forms are primary imperfectives (bare, i.e., "unprefixed" verbs), e.g., *pis-a-ć* 'to write' (root + theme vowel + infinitive). Primary imperfective forms can be perfectivized by means of a prefix e.g., *na-pis-a-ć* 'to write down' (prefix + root + theme vowel + infinitive). A verbal stem may combine with different aspectual prefixes, e.g., *podpisać*.PFV 'to sign,' *napisać*.PFV 'to write down,' *przepisać*.PFV 'to copy something in writing,' *wypisać*.PFV 'to prescribe,' and the same prefix can combine with many verbal stems, e.g., *odskoczyć*.PFV 'to jump away,' *odstawić*.PFV 'to put away,' *odnieść*.PFV 'to bring back,' *oddać*.PFV 'to give back,' *odtworzyć*.PFV 'to recreate.' As is evident from the English translations, the stem of the verb pisać.IPFV 'to write' can acquire different, sometimes remotely related readings depending on the prefix it cooccurs with, and the prefix *od-* expresses different meanings depending on the verbal predicate it is attached to. The perfectivizing contribution of some prefixes can be undone by means of secondary imperfective morphology (in Polish these are -yw- or -a- suffixes), e.g., *pod-pis-yw-a-ć* 'to sign (imperfective)' (prefix + root + secondary.impf + theme vowel + infinitive) or *w-bij-a-ć* 'to hammer' (prefix + root + secondary.impf + infinitive). Most secondary imperfectivized perfective verbs do not have primary imperfective equivalents in Polish and most Slavic languages, hence the term secondary imperfective may sound

[1] Polish is used for illustration but this generalizes to all Slavic languages.

misleading, but this term is conventionally used in the Slavic aspectual literature to talk about verbs derived from perfective verbal bases by means of secondary imperfectivizing morphology; whenever we use the term secondary imperfective, we mean derived imperfective. It is commonly assumed that secondary imperfective morphology cooccurs with verbs with lexical prefixes only.

Lexical prefixes can change the meaning and the argument structure of the base verb in unpredictable, idiosyncratic ways and they do not stack. Most typically, secondary imperfective suffixes do not co-occur with superlexical prefixes, which have a predictable meaning and distribution (see Romanova 2004, 2007). However, this view is not uncontroversial when confronted with cross-Slavic facts. Morevoer, there is little consensus regarding the nature of secondary imperfective (SI) morphemes in Slavic languages. Different perspectives are drawn from a wide range of studies (see Rothstein 2020, Schoorlemmer 1995, Babko-Malaya 1999, Istratkova 2004, Milićević 2004, Svenonius 2004b,a, Romanova 2004, Filip 2005, di Sciullo & Slabakova 2005, Arsenijević 2006, Romanova 2007, Ramchand 2008a,b, Łazorczyk 2010, Markova 2011, Tatevosov 2011, 2015, Biskup 2012, Wiland 2012, Žaucer 2012, Biskup 2019, Matushansky 2021, Klimek-Jankowska & Błaszczak 2022, 2023, Kwapiszewski 2022, Živojinović et al. 2025) which rely on data from individual languages to make generalizations about the status of secondary imperfective morphology. There is no research investigating secondary imperfectivization systematically from a broad comparative perspective. The primary objective of our paper is to fill this niche and present novel quantitative data related to the variation in the formation of SI variants of perfective verbs with purely perfectivizing prefixes in several Slavic languages. We show that this morphological process is significantly more productive in Russian ('Rus'), Ukrainian ('Ukr'), Macedonian ('Mac') and Bulgarian ('Bul') than in Polish ('Pol'), Czech ('Cze'), Serbian ('Ser')[2], Slovenian ('Slo') and this split aligns with Dickey's 2000 and 2015 East-West aspect division.

In order to understand whether this variation in the morphological productivity of forming SIs is semantically conditioned, we conducted an acceptability rating scenario-based study in which we tested the availability of single ongoing and habitual readings of SI verbs with purely perfectivizing prefixes in Bul, Mac, Ukr and Rus and showed that they have a specialized habitual meaning in Mac and Bul and both single ongoing and habitual readings in Rus and Ukr.

We conclude that the disparity in the productivity of SI verbs with purely perfectivizing prefixes across Slavic is not arbitrary but is systematically determined by the range of derivational possibilities within each language, resulting in distinct semantic implications. We account for these observations by postulating two types of SI morphemes – SI and SI-*hab*. SI is equally productive and semantically uniform across Slavic, while SI-*hab* is productive only in the Eastern aspectual group but varies in its semantics.

2 ASPECT AND SECONDARY IMPERFECTIVIZATION FROM A CROSS-SLAVIC PERSPECTIVE

All Slavic languages exhibit aspectual distinctions for nearly all verbs. As stated in the introduction, the simplest aspectual forms are primary imperfectives, which lack any prefixes. Primary imperfectives can be transformed into perfectives by adding a prefix, as illustrated for Polish, Bulgarian, Macedonian, Ukrainian, Russian, Czech, Serbian and Slovenian in (1).

(1) pisać.IPFV – napisać.PFV (Pol)
piša.IPFV – napiša.PFV (Bul)
pišuva.IPFV – napiše.PFV (Mac)
pysaty.IPFV – napysaty.PFV (Ukr)

[2] Our informants for the present study are speakers of Serbian, so we cannot make predictions on the distribution of SI in Bosnian and Croatian. Therefore, we limit the discussion to Serbian.

pisat'.IPFV – napisat'.PFV (Rus)
psát.IPFV – napsat.PFV (Cze)
pisati.IPFV – napisati.PFV (Ser)
pisati.IPFV – napisati.PFV (Slo)

As mentioned earlier, some prefixed verbs can be imperfectivized by means of suffixes such as *-yw-*, *-va-*, *-a-*, or vowel alternations. Such derived imperfective forms are conventionally called SECONDARY IMPERFECTIVES (henceforth SI) and are illustrated in Table 1 for West Slavic, Table 2 for East Slavic, Table 3 for South-East Slavic and Table 4 for South-West Slavic.

Cze		Pol		English
PFV	SI	PFV	SI	
podepsat	podepisovat	podpisać	podpisywać	'sign'
odpovědět	odpovídat	odpowiedzieć	odpowiadać	'answer'
vysvětlit	vysvětlovat	wyjaśnić	wyjaśniać	'explain'
prodat	prodávat	sprzedać	sprzedawać	'sell'
popsat	popisovat	opisać	opisywać	'describe'

Table 1: SI of lexically prefixed verbs in West Slavic (Cze and Pol)

Rus		Ukr		English
PFV	SI	PFV	SI	
podpisat'	podpisyvat'	pidpisaty	pidpisuvaty	'sign'
otvetit'	otvečat'	vidpovisty	vidpovidaty	'answer'
objasnit'	objasnjat'	pojasnyty	pojasnjuvaty	'explain'
prodat'	prodavat'	prodaty	prodavaty	'sell'
opisat'	opisyvat'	opysaty	opysuvaty	'describe'

Table 2: SI of lexically prefixed verbs in East Slavic (Rus and Ukr)

Bul		Mac		English
PFV	SI	PFV	SI	
podpiša	podpisvam	potpiše	potpišuva	'sign'
otgovorja	otgovarjam	odgovori	odgovara	'answer'
objasnja	objasnjavam	objasni	objasnuva	'explain'
prodam	prodavam	prodade	prodaduva	'sell'
opiša	opisvam	opiše	opišuva	'describe'

Table 3: SI of lexically prefixed verbs in South-East Slavic (Bul and Mac)

Crucially, the productivity of secondary imperfectivization varies across Slavic and depending on the prefix type. For example, perfective verbs with lexical prefixes can freely form SI counterparts across Slavic languages (see Babko-Malaya 1999, Ramchand 2008a,b, Romanova 2004, 2007, Biskup 2012, 2019, Svenonius 2004b a.o.). Lexical prefixes not only perfectivize verbs but they additionally change verb meanings, quite often in unpredictable ways. The standard criteria for categorizing aspectual prefixes as lexical include:

- inducing idiosyncratic changes in the meaning of a verbal predicate that cannot be derived from either the verb or the prefix itself;
- altering the argument structure/selectional restrictions of a verb. Perfective verbs that have been modified with lexical prefixes can form SI verbs by adding *-yv-* or *-a-* suffix or vowel alternations.

Ser		Slo		English
PFV	SI	PFV	SI	
potpisati	potpisivati	podpisati	podpisovati	'sign'
odgovoriti	odgovarati	odgovoriti	odgovarjati	'answer'
objasniti	objašnjavati	pojasniti	pojasnjevati	'explain'
prodati	prodavati	prodati	prodajati	'sell'
opisati	opisivati	opisati	opisovati	'describe'

Table 4: SI of lexically prefixed verbs in South-West Slavic (Ser and Slo)

Just like in the case of bare imperfective forms, secondary imperfective forms of lexically prefixed verbs have two canonical readings: (i) single ongoing and (ii) habitual.

Another class of prefixes are the superlexical prefixes (SP), which perfectivize verbs and bring about predictable changes in their meaning. In Section 3.3 we focus on the interaction of SI morphology with the superlexical delimitative *po-* prefix. According to Piñón (1994), the delimitative prefix *po-* of the so-called POFECTIVE VERBS is a marker of temporal delimitation. It describes eventualities which last only a relatively short time and does not make reference to their beginning or endpoint and thus can be translated with a temporal phrase 'for a while' or 'a little bit' as in the Polish examples *poczytać* 'to read for a while/a little', *poleżeć* 'to lie for a while/a little', *pooglądać* 'to watch for a while/a little', *poczytać* 'to read for a while/a little', *pograć* 'to play for a while/a little', *posiedzieć* 'to sit for a while/a little'.[3]

In Slavic languages, several aspectual prefixes can co-occur, subject to specific constraints. Superlexical prefixes (SP) can precede lexical ones, whereas the reverse order is not permissible. According to Romanova (2004) and Svenonius (2004b), this suggests that lexical and superlexical prefixes occupy distinct syntactic positions relative to vP: lexical prefixes are situated within vP, whereas superlexical prefixes exist outside vP.[4] The stacking properties of superlexical prefixes (SP) relative to other prefixes and secondary imperfective morphemes will be relevant in our formal analysis presented in Section 4.

Yet another class of prefixes are the so called purely perfectivizing[5] or empty prefixes. They do not alter the verb in any way except for changing its aspectual interpretation (see Bogusławski 1963, Svenonius 2004b,a, Młynarczyk 2004, Willim 2006, Ramchand 2008a,b). Verbs with purely perfectivizing prefixes differ in their productivity of forming SI counterparts across Slavic. Klimek-Jankowska & Simeonova (to appear) investigated the productivity of forming SI verbs with purely perfectivizing prefixes in Bul and Pol. They found that almost every Bul verb has the ability to form SI counterparts (see

[3]We observe that there is a difference in the productivity of the delimitative prefix *po-* across Slavic. It is more productive in East and West Slavic than in South Slavic. Moreover, not all Slavic languages have both types of readings ('for a while' and 'a little bit') of *po*. While we leave these intricacies to future work, it suffices that all the languages we consider in this paper have at least one reading.

[4]Studying secondary imperfectivization of verbs with superlexical prefixes (SP) from a comparative perspective requires earlier research systematizing our knowledge related to their productivity and meaning. They are considerably less productive in South Slavic than in East and West Slavic (see Dickey (2000) and his later works). Moreover, our preliminary research suggests that delimitative *po-* may have a dominant temporal delimitative meaning in some Slavic languages and attentuative meaning in others. This requires further research.

[5]Janda & Nesset (2010) emphasize that Rus has at least 16 prefixes forming natural perfectives (the ones that are not semantically distinct from the unprefixed base verb), suggesting that they encode more fine-grained distinctions. They propose that in the case of natural perfectives there is a semantic overlap between the meaning of the prefix and the meaning of the base verb and the diversity of prefixes used in natural perfectives follows from the fact that the base verbs from which they are derived fall into semantically diverse classes. Building on that, Janda & Lyashevskaya (2013) propose that the verbal prefixes act as classifiers in that they select verbs according to broad semantic traits, categorizing them the way numeral classifiers in some languages categorize nouns. We think that irrespective of the terminology used, there is a general consensus that the prefixes in natural perfectives do not modify the meaning of the base verbs but they may only impose selectional restrictions on the base verbs they combine with. Therefore, we will maintain the terminology 'purely perfectivizing'.

also Nicolova (2017): 5.3.25, Dickey (2000): 11). By contrast, Pol perfective forms with empty prefixes cannot undergo SI formation, as demonstrated in Table 5 (see also Łazorczyk 2010, Łaziński 2011, 2020, Wiemer et al. 2020, 2023, Kwapiszewski 2021, Klimek-Jankowska & Błaszczak 2022, 2023).

Pol			Bul			English
IPFV	PFV	SI	IPFV	PFV	SI	
budować	zbudować	*zbudowywać	stroja	postroja	postrojavam	'build'
pisać	napisać	*napisywać	piša	napiša	napisvam	'write'
smażyć	usmażyć	*usmażywać	părža	izpărža	izpăržvam	'fry'
prasować	wyprasować	*wyprasowywać	gladja	izgladja	izglaždam	'iron'
liczyć	policzyć	*policzać	broja	prebroja	prebrojavam	'count'
prosić	poprosić	*popraszać	molja	pomolja	pomolvam	'ask'
czytać	przeczytać	*przeczytywać	četa	pročeta	pročitam	'read'

Table 5: SI forms of verbs with purely perfectivizing prefixes in Pol and Bul

To understand why SI forms of empty prefixed perfective verbs are blocked by their near synonymous bare imperfective counterparts in Pol but not in Bul, Klimek-Jankowska & Simeonova (to appear) tested the meaning of SI of the type presented in Table 5 in Bul. They observed that Bul SI forms of empty prefixed verbs, unlike their bare imperfective counterparts, do not allow an ongoing reading, as shown in (2), but convey a specialized habitual sense, as in (3).

(2) Single ongoing:
Kogato telefonăt zvănna, točno { părže-h / *iz-părž-va-h
when phone rang.AOR.3SG just fry.IPFV-IMP.1SG PURE.PFV-fry.SI-IMP.1SG
} kjufteta. (Bul)
meatballs
'When the phone rang, I was (right in the middle of) frying meatballs.'

(3) Habitual:
Kogato prave-h zakuska, obiknoveno { părže-h / iz-părž-va-h
when make.IPFV-IMP.1SG breakfast usually fry.IPFV-IMP.1SG PURE.PFV-fry-SI.1SG
} po 3 kjufteta na čovek. (Bul)
DSTR 3 meatballs per person
'When I made breakfast, I usually used to fry 3 meatballs per person.'

The meaning of empty-prefixed SI forms differs from the bare imperfective (underived) form and from the SI form of lexically prefixed verbs in that it is specialized to habitual readings only, which we formally define as a series of bounded events distributed over separate temporally non-overlapping occasions. In order to formally capture this observation, Klimek-Jankowska & Simeonova (to appear) proposed that Bul has two types of SI morphemes merging at two syntactic layers – one higher and one lower – while in Pol, the low SI morpheme merges only in the lower one, as schematized in (4).

(4) SI-*high* » SI-*low* (Bul)
SI-*low* (Pol)

Previous research has not attempted to test this difference in the productivity and meaning of SI verbs with purely perfectivizing prefixes systematically across different Slavic languages. The goal of our study is to fill in this niche.

3 OUR RESEARCH

3.1 ON THE PRODUCTIVITY OF FORMING SI COUNTERPARTS OF EMPTY PREFIXED VERBS

Our research question is whether other Slavic languages pattern with Pol or Bul in their productivity of empty-prefixed SI verbs.

3.1.1 METHODOLOGY

Pol was used as a reference language throughout our comparative study because it is extremely restrictive as to the formation of empty-prefixed SI verbs, as shown in Table 5. We selected 130 high-frequency perfective verbs from the list of the first 3000 verbs in the frequency list of Pol verbs in Pęzik (2012). All the selected Polish verbs form a pair consisting of an unprefixed imperfective and its prefixed perfective counterpart but they do not have an SI counterpart. The verbs were initially translated into English; the 130 English verbs were subsequently translated into the other Slavic languages (Bul, Cze, Mac, Rus, Ser, Slo, Ukr) by native speaker informants of these languages (one per language). All the native speaker informants could access the English translation and the Pol original verbs and they were asked to translate them as closely as possible to their target languages. Both Polish verbal forms and their English translations were provided to native speaker translators to facilitate the choice of best translation equivalents in the target languages. All the translators knew English, some of them also knew Polish. We relied on the assumption that Slavic languages are to some degree mutually intelligible. English translations were used to clarify the meaning of Polish verbs and to avoid the choice of false friends in the target languages. However, English translations alone would not be sufficient because they are often polysemous and can be translated by more than one verb in Slavic languages, hence Polish verbs were provided to optimize the selection of the closest lexical equivalent in the target language. From the translated lists of verbs in the target languages, we excluded all verbs that did not form bare IPFV→PFV pairs. The original list of items got considerably reduced in South Slavic languages where many verbs were biaspectual or had a perfective variant with no bare imperfective counterpart. After this exclusion our target lists contained:

- 72 bare IPFV→PFV pairs in Mac
- 62 bare IPFV→PFV pairs in Bul
- 69 bare IPFV→PFV pairs in Ser
- 65 bare IPFV→PFV paiars in Slo
- 130 bare IPFV→PFV pairs in Ukr
- 124 bare IPFV→PFV pairs in Rus
- 130 bare IPFV→PFV pairs in Cze

Eastern aspectual group

- 45 (72.6%) verbs formed SI equivalents in Bul
- 46 (63.8%) verbs formed SI equivalents in Mac
- 61 (49.5%) verbs formed SI counterparts in Rus
- 47 (36%) verbs formed SI equivalents in Ukr

Western aspectual group

- 10 (15%) verbs formed SI equivalents in Slo
- 3 (4.3%) verbs formed SI equivalents in Ser
- 2 (1,5%) verbs formed SI variants in Cze

These numbers clearly show a split into an Eastern and Western aspectual group (in line with Dickey (2000) and Dickey (2015)).[6] The Eastern aspectual group comprising Rus, Ukr, Bul, Mac is considerably more productive in forming SI forms of empty prefixed verbs (triplets) as compared to the Western aspectual group consisting of Pol, Cze, Slo, Ser. This split is illustrated in Tables 6, 7, 8 and 9.

Cze			Pol			Eng
IPFV	PFV	SI	IPFV	PFV	SI	
psát	napsat	*napsávat	pisać	napisać	*napisywać	'write'
volat	zavolat	*SI	wołać	zawołać	*zawoływać	'call'
učit se	naučit se	*naučovat se	uczyć się	nauczyć się	*nauczać się	'learn'
solit	osolit	*SI	solić	posolić	*posoliwać	'salt'
vařit	uvařit	*uvařovat	gotować	ugotować	*ugotowywać	'cook'

Table 6: SI of empty prefixed verbs in West Slavic (Cze and Pol)

Ser			Slo			Eng
IPFV	PFV	SI	IPFV	PFV	SI	
pisati	napisati	*napisivati	pisati	napisati	*napisovati	'write'
zvoniti	pozvoniti	*pozvanjati	zvoniti	pozvoniti	*pozvanjati	'call'
učiti	naučiti	*naučavati	učiti	naučiti	*naučevati	'learn'
soliti	posoliti	*posoljavati	soliti	posoliti	*posoljevati	'salt'
kuvati	skuvati	*skuvavati	kuhati	skuhati	*skuhavati	'cook'

Table 7: SI of lexically prefixed verbs in South-East Slavic (Ser and Slo)

Bul			Mac			Eng
IPFV	PFV	SI	IPFV	PFV	SI	
piša	napiša	napisvam	pišuva	napiše	napišuva	'write'
zvănja	pozvănja	pozvănjavam	dzvoni	zadzvoni	zadzvonuva	'call'
uča	nauča	naučavam	uči	nauči	naučuva	'learn'
solja	posolja	posoljavam	soli	posoli	posoluva	'salt'
gotvja	nagotvja	nagotvjam	gotvi	zgotvi	zgotvuva	'cook'

Table 8: SI of lexically prefixed verbs in South-West Slavic (Bul and Mac)

3.2 A PILOT STUDY ON THE RANGE OF MEANINGS OF SI FORMS OF EMPTY PREFIXED VERBS IN UKR, RUS, BUL AND MAC

Having found high productivity of SI in a number of East Slavic languages, the next question we address is whether empty-prefixed SI forms are specialized to express only habitual meaning also in Mac, Rus, Ukr, as was found to be the case for Bul by Klimek-Jankowska & Simeonova (to appear).

[6]We are referring to Dickey's 2000, 2015 aspectual typology of Slavic and not to the general typology consisting of East, West and South Slavic. Dickey's Eastern aspectual group encompasses East Slavic and the Eastern branch of South Slavic including Macedonian and Bulgarian.

Rus			Ukr			Eng
IPFV	PFV	SI	IPFV	PFV	SI	
pisat'	napisat'	napisyvat'	pysaty	napysaty	napysuvaty	'sign'
zvonit'	pozvonit'	pozvanivat'	dzvonyty	podzvonyty	podzvonjuvaty	'call'
učit'sja	naučit'sja	naučat'sja	včytysja	navčytysja	naučuvatysja	'learn'
solit'	posolit'	posalivat'	solyty	posolyty	posoljuvaty	'salt'
gotovit'	prigotovit'	prigotavlivat'	varyty	zvaryty	zvarjuvaty	'cook'

Table 9: SI of lexically prefixed verbs in East Slavic (Rus and Ukr)

We conducted a pilot study based on 10 empty-prefixed SI verbs in Bul, Mac, Rus and Ukr, among those already used in Study 1.[7] We created two kinds of scenarios (10 single ongoing and 10 habitual scenarios) and 20 fillers (10 acceptable and 10 unacceptable) resulting in a set of 40 contexts altogether. The fillers were similar in length to the tested items and they contained either negation, adverbs *always*, *ever*, *never*, periphrastic future forms, phasal verbs or multiplicatives. The unacceptable fillers contained wrong aspectual forms. Fillers were used to distract the participants from the purpose of the study to prevent them from developing any strategy in providing responses. Unacceptable fillers were also used to make sure our online participants identified them correctly as unacceptable. Examples of the test items are shown in (5) (Mac), (6) (Bul), (7) (Ukr), (8) (Rus) where examples (a) represent ongoing contexts and examples (b) habitual contexts.

(5) a. Koga za-vrna, gi pro-čit-uva-v vestite. (Mac)
when ZA-rain.AOR.3SG they.ACC PURE.PFV-read-SI-IMP.1SG news
'When it started raining, I was reading the news.'

b. Koga odev vo leto kaj baba mi, sekoja večer
when go.AOR.3SG in summer to grandmother me.DAT every evening
mi pro-čit-uva-še po edna bajka. (Mac)
me.DAT PURE.PFV-read-SI-IMP.3SG DSTR one fairytale
'When I visited my grandmother in the summer, she used to read one fairytale per evening to me.'

(6) a. Tazi večer kogato majka mi vleze v stajata mi az si
tonight evening when mother my enter.AOR.3SG in room my I DAT
na-pis-va-h domašnoto. (Bul)
PURE.PFV-write-SI-IMP.1SG homework
'Tonight, when my mother entered my room I was doing my homework'

b. Predi si na-pis-va-h domašnite za dva časa, no sega
before DAT PURE.PFV-write-SI-IMP.1SG homework for two hours but now
imam poveče i mi otnema tri časa. (Bul)
have more and me takes three
'Before I used to do my homework in two hours but now I have more [homework] and it takes me three hours.'

(7) a. Koly vin za-jšo-v v mahazyn, prodavščycja z-važ-uva-la
when he ZA-enter.PST.SGM in store saleswoman PURE.PFV-weigh-SI-PST.SGF
cukerky. (Ukr)
candies
'When he entered the store, the saleswoman was weighing candies.'

b. Koly ja pracjuvala na plantaciji, ja z-važ-uva-la kožen
when I work.PST.SGF on plantation I PURE.PFV-weigh-SI-PST.SGF each

[7] Some verbs were the same across all languages and some were different.

kavun pered vidpravlennjam na transportuvannja. (Ukr)
watermelon before sending to shipment
'When I worked on the plantation, I used to weigh each watermelon before sending it to shipment.'

(8) a. Ja po-zvoni-l ej, kogda ona kak raz pro-čit-yva-la
I PURE.PFV-call.PST.SGM her-DAT when she like once PURE.PFV-read-SI-PST.SG
moë soobščenie. (Rus)
my message
'I called her when she was just reading my message.'

b. Učitel'nica vsegda pro-čit-yva-la diktant dvaždy. (Rus)
teacher always PURE.PFV-read-SI-PST.SGF dictation twice
'The teacher always used to read the dictation exercise twice.'

The pilot study was programmed on SoSci Survey[8] as an acceptability rating study. We obtained 13 responses for Bul, 12 for Mac, 10 for Rus and 10 for Ukr. The participants were asked to rate the acceptability of the presented contexts using a slider (with hidden numerical values ranging from 0-100) based on their native speaker intuitions, as depicted in Figure 1. The instruction was provided in the native language of the participants of the study. The English translation of the instruction is as follows:

> Dear Participant, you are kindly asked to rate the acceptability of the presented contexts using a slider. The left side of the slider means that the context is completely unacceptable, and the right side means that the context is completely acceptable.

Note further that the words 'acceptable' and 'unacceptable' were visible at all times for each example during the test phase. We collected responses online from native speaker informants using our private contacts and by disseminating the link to our study on social media. Our respondents were non-linguists.

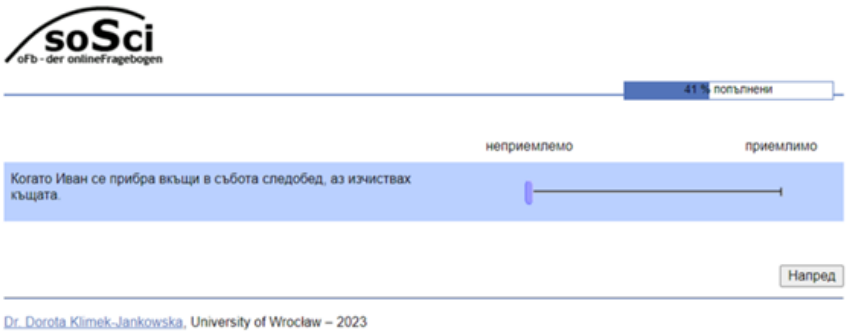


Figure 1: An example of a single experimental item in our online study

Language Context	Single ongoing context	Habitual contexts
Mac	22	76
Bul	16	86
Ukr	84	82
Rus	56	69

Table 10: Results of Study 2 - Grand Average acceptability score of SI forms across contexts and participants

[8]https://www.soscisurvey.de/en/index

The results of this pilot study show another split, within the Eastern aspectual group: the South Eastern group (Bul and Mac) obtain a specialized habitual meaning of the tested SI forms (the acceptability rating of these forms in single ongoing scenarios was very low across contexts and participants, on average 22 on a scale of 100 in Mac and 16 on a scale of 100 in Bul), whereas the North Eastern group allowed for both single ongoing and habitual readings (the acceptability ratings are comparable in both types of contexts in Rus and Ukr).

Altogether our studies in Section 3.1 and 3.2 identified a division into Eastern (Bul, Mac, Rus and Ukr) and Western (Cze, Pol, Ser, Slo) aspectual groups, with the former being significantly more productive in the formation of secondary imperfective forms of verbs with purely perfectivizing prefixes. Besides, the study discussed in 3.2 identifies another split within the Eastern aspectual group: South East Slavic (Bul, Mac) only allows a habitual use of purely perfectivized SI verbs, while North East Slavic (Rus, Ukr) allows both habitual and ongoing readings. The results from both studies are summarized in Table 11.

	West Slavic **Cze, Pol, Ser, Slo**	South East Slavic **Bul, Mac**	North East Slavic **Rus, Ukr**
Productivity of empty-prefixed SI	Very low	High	High
Meaning of empty-prefixed SI	–	Habitual	Habitual and Single Ongoing
SI morpheme		SI-*hab*	SI

Table 11: Summary of the results

We propose a formal account in Section 5. However, as anticipated in Section 2, in order to have a more comprehensive picture, we additionally examined the interaction of SI morphology with the superlexical delimitative prefix *po-*. Our observations are presented in Section 3.3.

3.3 INTERACTION BETWEEN SI AND THE SUPERLEXICAL DELIMITATIVE PREFIX *po-*

The following data show that Pol, Cz, Ser and Slo differ from Ukr, Rus, Bul and Mac in that only the latter group of languages can form secondary imperfective counterparts of perfective verbs with the delimitative prefix *po-* and – crucially for our analysis – these SI verbs receive habitual meaning only ((9), (10), (11), (12)) and are unacceptable in single ongoing contexts ((13), (14), (15), (16)), including in Rus and Ukr.

Habitual contexts:

(9) Vsjaka sutrin rabote-h kato vol, čak po objad po-sjad-va-h za
every morning work-IMP.1SG like ox until on noon PO-sit-SI-IMP.1SG for
minuta. (Bul)
minute
'Every morning I used to work like a dog, only at noon did I have the chance to sit for a while.'

(10) Sekoja nedela rabote-v kako konj, samo za vreme na vikendi-te
every week work.IPFV-IMP.1SG like horse only at time of weekends-DEF
{ po-igr-uva-v / igra-v } igri na kompjuter. (Mac)
PO-play-SI-IMP.1SG play.IPFV-IMP.1SG games on computer
'Every week I used to work like a dog, only on the weekends did I have the chance to play computer games for a while.'

(11) Kožnoho večora pislja roboty vin dovho po-sydž-uva-v na ganku. (Ukr)
every evening after work he long PO-sit-SI-PST.SGM on porch
'Every evening after work, he used to sit on the porch for a while.'

(12) On vsegda po-siž-iva-l u babuški v sadu i smotre-l
he always PO-sit-SI-PST.SGM at grandmother in garden and watch.IPFV-SGM
na ptic. (Rus)
at birds
'He always used to sit in his grandmother's garden and watched the birds.'

Single ongoing contexts:

(13) #Dokato po-sjad-va-h na stola iztoštena telefonăt pak zvănna.
when PO-sit-SI-IMP.1SG on chair exhausted telephone- again rang.AOR.3SG
'While I was sitting down on the chair, the phone rang again.' (Bul)

(14) #Dodeka po-igr-uva-v igri na kompjuter, telefonot za-dzvon-i.
while PO-play-SI-IMP.1SG games on computer telephone ZA-ring-AOR.3SG
'While I was playing computer games, the phone rang.' (Mac)

(15) #Koly ja po-vernu-la-sja z roboty, vin po-sydž-uva-v bilja kamina.
when I PO-return.-PST.SGF-REFL from work he PO-sit-SI-PST.SGM by fireplace

'When I got home from work, he was sitting by the fireplace.' (Ukr)

(16) #Kogda ja vernu-la-s' domoj, on po-siž-iva-l s knigoj vozle
when I return.-PST.SGF-REFL home he PO-sit-SI-PST.SGM with book by
kamina. (Rus)
fireplace.
'When I got home from work, he was sitting by the fireplace.'

By contrast, in the Western aspectual group, Pol, Cze, Ser and Slo delimitative *po-* perfectivizes imperfective verbs but these forms cannot be secondarily imperfectivized ((17), (18), (19), (20)).

(17) { Po-pisa-ł / *po-pis-ywa-ł } notatki przez chwilę i
PO.write.PFV-PST-3SG PO.write.PFV-SI-PST-3SG notes for while and
się znudzi-ł. (Pol)
REFL get.bored.PFV-PST.3SG
'He took notes for a while and got bored.'

(18) Chvíli si { po-pisa-l / *po-piso-va-l } poznámky
for-a-while REFL PO.write.PFV-PST.3SG PO.write.PFV-SI-PST.3SG notes
a znudil se. (Cze)
and get.bored.PFV-PST.3SG REFL
'He took notes for a while and got bored.'

(19) Juče smo { po-sede-li / *po-seđ-iva-li } neko vreme u
yesterday be.PRS.1PL PO-sit-PRT.PLM PO-sit-SI-PRT.PLM some time at
kafiću i malo { po-pričali / *po-priča-va-li } o vestima. (Ser)
bar and little PO-talkPST.PLM PO-talk-SI-PST.PLM about news
'Yesterday we sat at the bar for a little and we talked a bit about the news.'

(20) Včeraj smo malo { po-sede-li / #po-sede-va-li } za šankom
yesterday be.PRS.1SG little PO-sit-SI-PRT.PLM PO-sit-SI-PRT.PLM at bar
preden smo šli domov. (Slo)
before be.PRS.1PL go.PRT.PLM home
'Yesterday we sat at the bar for a little before going home.'

To sum up, when delimitative *po-* is attached to bare imperfective verbs, the resulting perfective verb cannot be further secondarily imperfectivized in Pol, Cze, Ser, Slo, but it can in Bul, Mac, Ukr and Rus and it has a specialized habitual meaning only.

4 TOWARDS AN ANALYSIS

To account for these observations, we propose that there are two distinct types of SI morphemes: SI and SI-*hab*. SI is equally productive and behaves consistently, displaying ambiguity between a single ongoing and habitual reading, in both groups of Slavic languages. SI-*hab* is only productive in the South Eastern group and has a specialized habitual meaning characterized by a series of temporally non-overlapping bounded events rather than serving the more general purpose of undoing the perfectivizing contribution of the prefix.

What remains to be explained is why SI-forms of empty prefixed verbs can be used in single ongoing contexts, exceptionally not blocked by their bare imperfective equivalents in Rus and Ukr, and why the same pattern is not observed with attenuative *po-*. In Study 2, we reported that perfective verbs with purely perfectivizing prefixes in Rus and Ukr can be interpreted as both habitual and single ongoing, i.e. they combine with SI but not with SI-*hab*. This is puzzling, as the operation of adding SI to empty-prefixed perfective verbs is semantically blocked in the remaining Slavic languages. It appears that Rus and Ukr are exceptional in this respect. For the sake of this analysis we assume that the variation between Bul/Mac on the one hand and Rus/Ukr on the other hand results from the fact that empty-prefixed perfective verbs may combine with SI-*hab* only in the former and with SI only in the latter. In Section 5, we capture these claims at a syntactic level via an Agree operation.

Before we proceed with the formal account, a few facts about the status of purely perfectivizing prefixes relative to SI and other superlexical prefixes (SP) are in order.

In most Slavic languages, perfective verbs with purely perfectivizing prefixes do not undergo secondary imperfectivization as in **na-pis-yw-ać* - 'to PURE.PFV-write-SI'. In Polish these verbs can form SI only when they serve as input to higher superlexical prefixes as in *po-na-pis-yw-ać* - 'to DIST-PURE.PFV-write-SI'. After the addition of the distributive prefix *po-* the resulting form becomes perfective even though the SI morpheme is phonologically there but it is realized lower in the structure than the perfectivizing superlexical prefix. Crucially, the distributive superlexical prefix makes the combination of purely perfectivizing prefixes and SI morphology licit in Polish. This suggests that purely perfectivizing prefixes in Pol are realized below SI and SI is realized below superlexical prefixes, hence we can assume the following hierarchy: SP » SI » PURE.PFV (for more arguments in favor of this hierarchy see Klimek-Jankowska & Błaszczak (2022), Klimek-Jankowska & Błaszczak (2023)).

5 FORMAL ANALYSIS OF SI-*hab* AND SI IN SLAVIC

We propose that the SI patterns identified in Study 1 and Study 2 can be captured as an Agree operation holding between a higher aspectual head and a lower functional head containing an aspectual morpheme. Following Halle & Marantz (1993), we assume Late Insertion: within syntactic computation, morphemes are represented by bundles of formal features that are attached to roots. The phonological realization of abstract morphemes is provided by Vocabulary Insertion, a PF operation by which a phonological exponent is paired with the feature bundle.

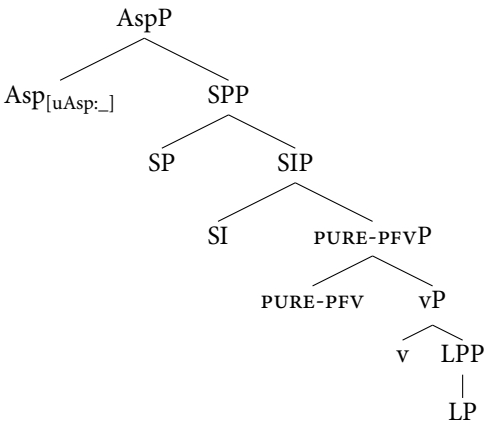
The possibility of analyzing SI as an instance of Agree was already explored in Arsenijević (2006) and Biskup (2021). While the former adopts a specifier-head (top-down) type of agreement, the latter employs a minimalist bottom-up version of agreement. In our analysis, we adopt a minimalist version of Agree that results from the following steps:

1. A functional head Asp with an unvalued uninterpretable feature [uAsp:_] is merged into the structure (Chomsky 2001).
2. [uAsp:_] turns Asp into an active Probe that looks down for the closest compatible active Goal in its c-command domain in order to value the unvalued feature.
3. For Agree to take place, the Goal must have a valued interpretable feature [Asp:Ipfv] or [Asp:Pfv].
4. When Agree takes place, the value of Asp on the Goal is assigned to [uAsp:_] on the Probe.

Once the unvalued feature receives its value, the derivation can be interpreted at LF. If the Probe is unable to find a compatible Goal in its c-command domain to match and value its feature, the derivation crashes.

We define the potential Goals for the valuation of [uAsp:_] on the Asp head as a set of lower functional heads associated with specific valued interpretable aspectual features. We assume the following structure:

(21)



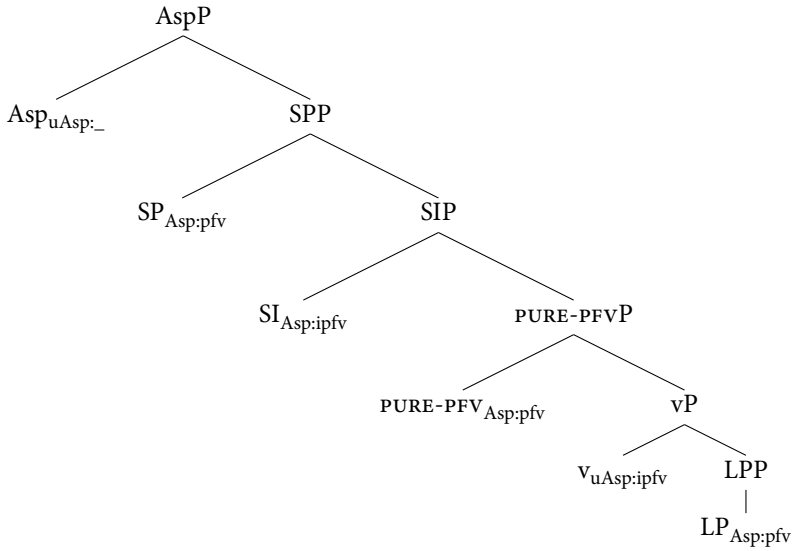
After Spell-Out, the relevant vP-external functional heads will host a Superlexical Prefix (SP), a SI morpheme or a purely perfectivizing prefix (pure-pfv); the Lexical Preifx (LP) head is realized vP-internally (following Romanova (2004), Ramchand (2004, 2008b)). These heads are strictly associated with a variety of aspectual morphemes: we propose that their realization in the syntactic structure is contingent on the presence of determined aspectual features. If no SP-related features are present, the SP head will not be merged, resulting in SI being the highest aspectual head in the structure. If no SI-related features are present, a feature associated with a pure-pfv prefix is merged. In line with Biskup (2021), we assume that aspect is uninterpretable on Asp: this head carries an unvalued uninterpretable feature [uAsp:_]. The functional head Asp turns into an active Probe because of the presence of the unvalued [uAsp:_] feature, which needs to find a valued aspectual feature on a compatible Goal in its c-command domain. The heads that may act as compatible Goals are SP, SI, pure-pfv, v and LP. All these heads carry valued interpretable features, specified as follows:

(22) SP = [asp:pfv]
SI = [asp:ipfv]
pure-pfv = [asp:pfv]
v = [asp:ipfv]
LP = [asp:pfv]

Following a minimality condition on Agree (Chomsky 2001), Biskup (2021) proposes that Asp will agree with the closest Goal, so Asp will agree with the highest aspectual functional head present in the structure. This is compatible with the idea that, when SP

is merged, its value overwrites lower aspectual featural specifications (cf. also Tatevosov 2011).

(23)



The structure in (23) shows that there is no functional head dedicated to SI-*hab* in the structure. In Section 5.1 we show that SI-*hab* is not realized as a separate functional head in syntax. Conversely, we show that SI-*hab* is the morphological outcome of an operation we define as parasitic agreement, which captures the intuition that the specialized habitual interpretation of SI-*hab* (being a sum of completed events) is parasitic on the earlier valuation of the perfective feature.

5.1 SI-*hab* AS PARASITIC AGREEMENT

Biskup (2021) follows the original Minimalist idea that features need to be valued before transfer in order to be correctly interpreted at LF; this is why Agree needs to be established. However, nothing prevents features that are already valued from being realized and passed to the semantic computation, without necessarily entering an Agree relationship. This is relevant in our study, as we know that beside perfective/imperfective, more aspectual values can be assigned. Crucially, we saw that in the Eastern aspectual group, Bul and Mac assign a habitual interpretation to SI-*hab*, while the situation is more nuanced in Rus and Ukr.

In this respect, we propose a distinction between "obligatory" features (features that need to be minimally realized in morphosyntax for Agree to take place) and "parasitic" features (valued features that bundle together with obligatory features and are passed to the semantic component without directly entering an Agree relation). In our case, only the perfective/imperfective information is represented in morphosyntax; therefore, the only "obligatory" features used within syntactic computation in agreement operations are the valued [ASP:PFV] and [ASP:IPFV] discussed in 5. Other aspectual values, such as the habitual one, are parasitic on one of these two obligatory values.

The concept of parasitism (parasitic agreement, parasitic features, parasitic gaps) has been the focus of a wide number of studies in generative syntax (Ross (1967), Taraldsen (1981), Engdahl (1983), Corver (2021)) and is generally intended as the presence of a property in a syntactic representation, which is strictly dependent on the presence of another property in the same syntactic representation. Our study contributes to the definition of the range of phenomena which display parasitism; in particular, we show that fine-grained aspectual distinctions, other than the binary perfective/imperfective distinction, are captured in terms of parasitic agreement. We propose the following definition of Parasitic Agreement, an adaptation of the one discussed in van Urk (2015)

(see also Ritter 1993, De Vincenzi & Di Domenico 1999, Chomsky 2001, Bruening 2001, Béjar & Kahnemuyipour 2018):

(24) Parasitic Agreement
If an active Probe P carries a feature F_p or an active Goal G carries a feature F_g and Agree takes place between P and G, other valued interpretable features F_x on P and G can also enter such Agree relations.

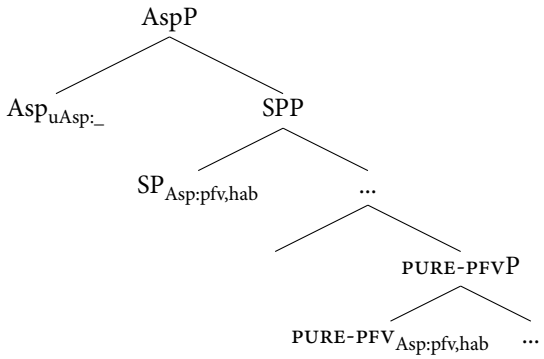
This means that, whenever Agree takes place, Asp is valued for the obligatory perfective or imperfective value, as well as any other valued features parasitic on them.

In the case of Bul and Mac SI-*hab*, the PURE-PFV and the SP head may contain an aspect feature valued as perfective, with a parasitic valued habitual feature:

(25) PURE-PFV = [ASP:PFV,HAB]
SP = [ASP:PFV,HAB]

When either PURE-PFV or SP are present in the structure and they represent the highest functional head associated with aspect, Agree will take place along the lines described in Section 5: the Asp Probe looks down for a compatible Goal to value its [UASP:_]. If it finds PURE-PFV as its closest Goal it will agree with it. However, in view of the minimality condition on Agree, if the Asp Probe finds SP as it closest Goal, agreement will have to take place with SP, blocking agreement with lower functional heads. The feature valuation of PURE-PFV and SP includes a parasitic HAB value, which is carried along with the perfective value to Asp. As a result, the Asp head will receive both values and it is then transferred to LF:

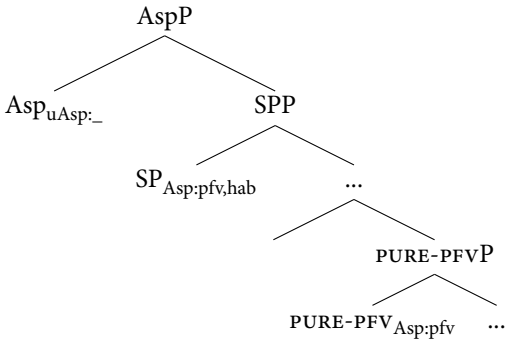
(26)



Following De Vincenzi & Di Domenico (1999)'s account of parasitic features, we propose that HAB is not visible to the syntactic parser and therefore does not directly trigger Agree, but it can participate in agreement relationships in conjunction with the valued ASP feature. The semantic value of HAB, however, is only relevant for interpretation at LF.

Besides, we argue that the parasitic nature of HAB allows for its optional realization on PURE-PFV or SP. The distribution of HAB captures the data on SI forms in Bul and Mac. Similarly, we argue that the same model captures the distribution of the habitual interpretation in Rus and Ukr. The variation in the distribution of SI-*hab* in Rus and Ukr is explained by the fact that the HAB feature is parasitic on SP only; PURE-PFV may only carry a PFV feature, but it does not optionally carry a HAB feature, as shown in (27).

(27)



This approach has a direct consequence for our definition of SI-*hab*. This is a descriptive term we adopted to identify the habitual SI morpheme, which was shown to be extremely productive in the Eastern aspectual group and very limited in the Western aspectual group. This morpheme is homophonous with the one associated with the SI head and, after linearization, they are both realized as SI suffixes; however, the two SI morphemes have different syntactic properties. At the syntactic level, SI-*hab* does not head a separate functional projection; our analysis shows that SI-*hab* needs to be understood as a HAB feature being parasitically (and optionally) realized together with the obligatory perfective value on a PURE-PFV or SP head in Bul and Mac, and on a SP head only in Rus and Ukr. This captures the observation that the SI morpheme gets a specialized habitual interpretation (a sum of completed temporally non-overlapping events), which in turn means that the SI-*hab* morpheme requires that the input be previously valued as perfective.

5.2 SUMMARY

Our approach relies on previous morphosyntactic analyses of aspect in terms of Agree (Arsenijević 2006, Biskup 2021). We propose a bottom-up minimalist model of Agree where an Asp Probe carries an unvalued [uAsp:_] feature. This feature needs to be valued by one of the valued features carried by lower functional projections associated with aspectual morphemes: SP carrying [ASP:PFV], SI carrying [ASP:IPFV], PURE-PFV carrying [ASP:PFV], v carrying [ASP:IPFV] and LP carrying [ASP:PFV].

We showed that habitual SI-*hab* in the Eastern aspectual group results from an Agree relationship holding between Asp and PURE-PFV or SP in Bul and Mac, which value Asp as perfective. In addition, PURE-PFV and SP in Bul and Mac are specified for a parasitic HAB feature, which participates in the Agree relationship established between Asp and one of the two functional heads, without directly triggering Agree: only the obligatory (minimally necessary) perfective value triggers Agree, while the parasitic value HAB only has an effect at LF. The same agreement pattern holds in Rus and Ukr, with the difference that HAB may be associated only with SP.

6 CONCLUSION

This study has provided a formal analysis of a systematic distinction in the productivity of SI in the Eastern and Western aspectual groups. Specifically, we confirmed the generalization discussed in Klimek-Jankowska & Simeonova (to appear) concerning Pol and Bul and extended it to other Slavic, showing that in Polish, Czech, Serbian, and Slovenian, perfective verbs with purely perfectivizing prefixes limit the formation of secondary imperfectives, unlike Bulgarian, Macedonian, Russian and Ukrainian, which derive such SI forms productively. Additionally, we identify a further distinction within the Eastern aspectual group in that only Bulgarian and Macedonian SI forms with purely perfectivizing prefixes and superlexical prefixes convey an exclusively habitual reading (the single ongoing interpretation is unavailable), whereas in Ukrainian and Russian, the

obligatory habitual reading is restricted to SI forms with the superlexical delimitative *po-*, while SI forms with purely perfectivizing prefixes are ambiguous between single ongoing and habitual readings.

Based on these findings, we proposed that there are two types of SI morphemes: SI and SI-*hab*. SI is universally available across Slavic languages and has a standard imperfective semantics (with both single ongoing and habitual readings). SI-*hab* is more productive in Bulgarian and Macedonian. Bulgarian and Macedonian perfective verbs with purely perfectivizing prefixes and superlexical prefixes combine only with SI-*hab*, while in Ukrainian and Russian, verbs with purely perfectivizing prefixes co-occur with SI, while verbs with the delimitative superlexical prefix *po-* co-occur with SI-*hab*.

At the formal level, we show that SI merges as an independent functional head across Slavic and when it is realized as the highest aspectual head, it values the uninterpetable unvalued feature [uAsp:_] on Asp as imperfective.

Conversely, SI-*hab* in the languages belonging to the Eastern aspectual group follows two patterns, giving rise to further variation. In Bulgarian and Macedonian, SI-*hab* is a phonological realization of the parasitic agreement operation established between an uninterpretable unvalued feature [uAsp:_] on the Asp head and an interpretable valued hab feature on purely perfectivizing and superlexical (SP) prefixes. By contrast, in Ukrainian and Russian, this parasitic agreement operation is established between Asp and SP only.

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ABBREVIATIONS

ACC	accusative
AOR	aorist
ASP	aspect
DAT	dative
DSTR	distributive
HAB	habitual
IMP	imperfect
IPFV	imperfective
LOC	locative
LP	lexical prefix
PST	past
PL	plural
PFV	perfective
PURE.PFV	purely perfectivizing
REFL	reflexive
SG	singular
SI	secondary imperfective
SP	superlexical prefix

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