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Iterative/Semelfactive = Collective/Singulative? Parallels in Slavic

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Abstract

In this paper, I will discuss a topic concerning part–whole structures in the nominal and verbal domain. Specifically, I will address the question of whether there is a universal mechanism for the individuation of entities and events by exploring parallels between singulatives and semelfactives in Slavic. Singulatives are derived unit nouns, whereas semelfactives are punctual verbs that describe a brief event which culminates by returning to the initial state. Cross-linguistically, singulative morphology often alternates with collective marking, whereas semelfactives alternate with iteratives. Collectives and iteratives describe homogenous groupings of entities and events, respectively. From a conceptual perspective, both singulatives and semelfactives individuate to the effect of singular bounded unit reference and in the literature, the parallel between the mass count/distinction and aspect has often been drawn. In Slavic, singulative and semelfactive morphologies share a component; specifically, both markers involve a nasal -N and a vocalic component, e.g., compare Russian *gorox* 'peas (as a mass)' ∼ *goroš*-IN-*a* 'a pea' and *prygat'* 'to jump (repeatedly)' ∼ *pryg*-NU-*t'* 'to jump once'. I will argue that the singulative -IN and semelfactive -NU are complex and both involve the very same -N, which denotes a declustering atomizer modeled in mereotopological terms.

Keywords: semelfactives; singulatives; iteratives; collectives; individuation; mereotopology

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1. Introduction

A lot of linguistic research has been fueled by the idea that in certain respects, there are surprising analogies between the nominal and the verbal domain. Observed similarities range from structural analogies concerning the DP/CP parallelism (e.g., Abney, 1987), through semantic analogies concerning the mass/count distinction, on the one hand, and (a)telicity, on the other (e.g., Filip, 1993; Krifka, 1989, 1998; Rothstein, 2008) to ontological correspondences regarding individual and eventive part–whole structures, especially in the context of plurality and pluractionality (e.g., Bach, 1986; Henderson, 2017; Landman, 2006; Lasersohn, 1995; Moltmann, 1997). This paper contributes to our understanding of the nature of the parallelism in question by examining analogies between singulatives and semelfactives (see Mehlig, 1994). In particular, I argue that the two empirical domains are governed by the same individuation mechanism, which is based on mereotopological notions and applies the operation of declustering aggregates into discrete singular units (Grimm, 2012).

The collective/singulative distinction in the nominal domain relates to the conceptual difference between a homogeneous collection (or an aggregate) of entities, on the one hand, and an individuated singular object, on the other. As such, it seems to parallel the iterative/semelfactive distinction in the verbal domain, which concerns the difference between an unbounded series of repetitive eventualities and a simplex discrete event, respectively. In this paper, I will explore structural and meaning parallels between semelfactive verbs and singulative nouns in Slavic. Based on morphological and semantic evidence, I will propose that Slavic semelfactive and singulative morphology share a common component, which introduces an operation that individuates a singular event or entity, respectively. I will argue that this operation should be modeled in mereotopological terms.

Singulatives are derived unit nouns that are morphologically marked and designate a singular entity, typically conceptualized as an object individuated from a homogeneous collection of entities (Acquaviva, 2015; Asmus & Werner, 2015; Corbett, 2000; Dali & Mathieu, 2021; Dimmendaal, 2000; Geist et al., 2023; Grimm, 2012, 2018; Kagan, 2024; Kagan & Nurmio, 2024; Kouneli, 2021; Mathieu, 2012, 2014; Noble, 2025; Ouwayda, 2014; Wągiel & Shlikhutka, 2023a; Wierzbicka, 1988). The category occurs across many languages and is attested, e.g., in Slavic, Celtic, Semitic, Cushitic and Nilo-Saharan. An example from Welsh is provided in (1), where (1-a) represents the ordinary singular/plural distinction, whereas (1-b) illustrates the marked collective/singulative distinction.

(1) a. cadair ∼ cadair-**iau**
chair.SG chair-PL
'a chair' ∼ 'chairs'
b. gwydd ∼ gwydd-**en**
tree.COLL tree-SGV
'trees, forest' ∼ 'a tree' (Welsh; Grimm, 2012, p. 2; Acquaviva, 2015, p. 1172)

In this paper, I focus on a particular function of singulative morphology present in some languages, namely that it can attach to uncountable nouns and turn them into countable nouns via a mass-count shift. This use of singulative morphology is notable, e.g., in some varieties of Arabic (e.g., Fassi Fehri, 2018; Hnout et al., 2021; Mathieu, 2012). To illustrate, the feminine singulative suffix *-at* in (2) attaches to a substance mass noun and forms a unit noun designating an individuated object: a piece or a portion of the substance.

(2) a. xašab ∼ xašab-**at**
wood wood-SGV
'wood' ∼ 'piece of wood'
b. šamʕ ∼ šamʕ-**at**
wax wax-SGV
'wax' ∼ 'wax-unit, a candle' (Standard Arabic; Fassi Fehri, 2018, p. 7)

The second class of expressions to be discussed in this paper are semelfactives, which are momentary (or punctual) verbs (e.g., Dickey & Janda, 2009; Donazzan & Tovena, 2017; Egg, 2018; Gyarmathy, 2016; Kuznetsova & Makarova, 2012; Moens & Steedman, 1988; Rothstein, 1976, 2004, 2008; C. Smith, 1991; Štarkl et al., 2025; Talmy, 1985; Taraldsen Medová & Wiland, 2019). They describe a very brief event constituting an instantaneous action. At the endpoint, it returns to the initial state, which makes multiple repetitions possible. Some prototypical examples from English are given in (3).

(3) a. blink
b. sneeze
c. knock
d. flash

What is important from the perspective of this paper is that in some languages, semelfactive verbs are marked by a special affix. Furthermore, the morphological marking of the semelfactive/iterative distinction is attested cross-linguistically including Finno-Ugric and Slavic. To illustrate, consider the Hungarian examples in (4), which show two marking patterns: with the semelfactive form marked, as in (4-a), and with the iterative form marked, as in (4-b).

(4) a. csóvál ∼ **meg**-csóvál
wag SMLF-wag
'wag (repeatedly)' ∼ 'wag (once)'
b. kacsint ∼ kacsint-**gat**
wink wink-ITR
'wink (once)' ∼ 'wink (repeatedly)' (Hungarian; Gyarmathy, 2016, p. 64)

There seems to be a conceptual analogy between singulatives and semelfactives since they both describe simplex singular entities and events, respectively, and. thus. involve unit reference (Mehlig, 1994). This, in turn, relates to the well-studied relationship between the mass/count distinction and lexical aspect. More generally, the analogy gives rise to the question to what extent part–whole structures encoded in the nominal and verbal domain are parallel and, ultimately, whether a universal mechanism for the individuation of entities and events is utilized in both domains.

I argue that Slavic languages offer an insight into the issue stated above since the conceptual analogy is reflected by an empirical one. The key observation is that Slavic singulatives and semelfactives share a common phonological component, namely, they both involve the nasal -N element and a vocalic segment.[1] For instance, consider the Russian examples in (5)–(6).

(5) a. gorox ∼ goroš-i**n**-a
pea.SG pea-SGV-SG
'peas (as a mass)' ∼ 'a pea'
b. vinograd ∼ vinograd-i**n**-a
grape.SG grape-SGV-SG
'grapes (as a mass)' ∼ 'a grape' (Russian, Kagan & Nurmio, 2024, p. 71)

(6) a. prygat' ∼ pryg-**n**u-t'
jump.IMPF jump-SMLF-INF
'to jump (repeatedly)' ∼ 'to jump once'
b. stučat' ∼ stuk-**n**u-t'
knock.IMPF knock-SMLF-INF
'to knock (repeatedly)' ∼ 'to knock once' (Russian, Kuznetsova & Makarova, 2012, p. 155)

The question this paper intends to tackle is as follows: Is it the same -N in (5) and (6)? My claim is that based on the similarities between Slavic singulatives and semelfactives, it is reasonable to assume that in fact, this is the same -N. Furthermore, I will argue that its semantic contribution can be captured in mereotopological terms (Grimm, 2012; Wągiel & Shlikhutka, 2023a) by extending the mereotopological approach to events (McNally, 2024; Wągiel, 2023a). Consequently, the evidence suggests that part–whole structures both in the nominal and in the verbal domain are richer than typically assumed.

Specifically, I will argue that the Slavic singulative suffix -IN and the semelfactive suffix -NU are in fact complex. The -N element denotes a declustering atomizer (cf. Scontras, 2014) that selects for an aggregate predicate and turns it into a predicate of discrete singular units. Crucially, -N operates on ontological primitives conceptualized as clusters and declusters

them, but it is not specified with respect to whether these primitives are entities or events. The constraint is introduced by the accompanying vocalic element.

The paper is outlined as follows. In Section 2, I discuss formal and semantic properties of Slavic singulatives and semelfactives. I introduce their basic characteristics and investigate some parallels between the two empirical domains including similar constraints on their formation, countability, low position in the structure, modification by scalar modifiers encoded in diminutive and intensifying suffixes and (very rare but attested) interaction of the singulative/semelfactive morphology with affixes introducing collectivity and secondary imperfectivization. In Section 3, I provide arguments for decomposing Slavic singulative and semelfactive morphology into two components: the shared nasal -N and a vocalic segment. In Section 4, I introduce the mereotopological framework adopted for the purpose of the analysis. The crucial notions concern the ontological distinction between maximally strongly self-connected entites, which correspond to discrete units, and clusters, i.e., structured pluralities. Based on recent proposals, I discuss how mereotopology can be extended to the domain of events. Section 5 presents my proposal for capturing the parallelism between singulatives and semelfactives, in which I distinguish between UNIT and AGGREGATE predicates. They are modeled in mereotopological terms as denoting properties maximally strongly self-connected individuals/events and (pluralities of) clusters of individual/events, respectively. Finally, Section 6 concludes the paper.

2. Iterative/Semelfactive = Collective/Singulative?

In this paper, I consider a hypothesis that the iterative/semelfactive distinction in the verbal domain is in fact equivalent to the collective/singulative distinction in the nominal domain. To the best of my knowledge, this idea was first briefly suggested by Mehlig (1994), but as far as I know, it was never considered in the tradition of formal linguistics. For this reason, it is important to establish core characteristics of the two categories in question. Let us begin with the discussion of some basic properties of Slavic singulatives.

2.1. Singulatives

Singulatives occur robustly in East Slavic languages but. to various degrees, are attested in all branches of North Slavic (e.g., Asmus & Werner, 2015; Corbett, 2000; Geist et al., 2023; Ivanović, 2020; Kagan, 2024; Kagan & Nurmio, 2024; Wągiel & Shlikhutka, 2023a, 2023b; Wierzbicka, 1988). In Slavic, similar to, e.g., Celtic, Arabic and Nilo-Saharan languages such as Luo (Dali & Mathieu, 2021), singulative morphology is used to turn uncountable nouns into countable ones. One of the Slavic derivational morphemes standardly analyzed as a singulative affix is the suffix -IN, which in different Slavic languages and/or different phonological environments takes the form *-in*, *-yn* or *-en*. Table 1 gives an overview of the North Slavic singulative formation. In South Slavic, the discussed type of singulativization is either entirely marginal or non-existent.[2]

Table 1. Singulatives in Slavic.

Group	Language	Gloss	Aggregate	Singulative
East Slavic	Belarusian	'straw'	saloma	salom**in**a
	Russian	'peas (as a mass)'	gorox	goroš**in**a
	Ukrainian	'sand'	pisok	piščy**n**a
West Slavic	Czech	'grass'	tráva	trav**in**a
	Polish	'snow'	śnieg	śnieżyn**k**a
	Upper Sorbian	'snow'	sněh	sněž**en**ka

The suffix -IN attaches to uncountable aggregate bases, whose referents are typically conceptualized as clustered collections of unindividuated entities, and forms countable unit nouns, which designate singular individuated objects. To illustrate, let us consider

a couple of examples in Table 1. For instance, the Belarusian noun *saloma* 'straw' is an uncountable aggregate noun that is typically used to refer to clustered dried plant stalks. In contrast, the singulative form *salomina* 'a straw' is a countable singular unit noun that designates a single straw (Lukašanec, 2016). Similarly, the Ukrainian noun *pisok* 'sand' typically denotes an aggregate of sand, whereas the singulative *piščyna* 'a grain of sand' is true of singular grains. Finally, the Upper Sorbian noun *sněh* translates as 'snow' and *sněženka* is the equivalent of 'snowflake' (Asmus & Werner, 2015).

Despite the fact that the singulative formation is (to various extents) attested in all languages in question, there is a stark difference in the occurrence of the category in East and West Slavic. While singulatives are widespread in East Slavic, there are only a few remnants in West Slavic, with the Polish form *śnieżynka* 'snowflake' being probably one of the only three preserved in the language.[3]

It is also important to emphasize that -IN is a multifunctional element that is used to derive various kinds of nouns. Though its functions differ across Slavic, some frequent uses concern, e.g., formation of spatial collectives designating names of forests, as in (7) (e.g., Wągiel, 2021a), and diminutivization expressing appreciation (or sometimes pity), seen in (8). For the most part, in this paper, I will only consider the proper singulative function illustrated in (5) and Table 1. However, in Section 3, I will examine morphological evidence from Czech hypocoristics and diminutive adjectives derived with -IN.

(7) grab ∼ grab-**in**-a
hornbeam.SG hornbeam-IN-SG
'a hornbeam' ∼ 'a hornbeam grove' (Polish, Wągiel, 2021a, p. 185)

(8) chłop ∼ chłop-**in**-a
guy.SG ∼ guy-IN-SG
'a guy' ∼ 'a good-natured guy' (Polish)

Though exploring all functions of -IN and their relationship is beyond the scope of this paper, it should be emphasized that there are attempts in the literature to capture this multifunctionality. For instance, Kagan (2024) proposes a unified analysis of the relationship between two different functions of *-in* in Russian, namely, the singulative use in (5) and the massifier use in (9), which is based on the idea that the marker denotes an unspecified partition shifter.

(9) kon' ∼ kon-**in**-a
horse.SG horse-IN-SG
'horse' ∼ 'horsemeat' (Russian, Kagan, 2024, p. 37)

Having discussed this paper's main empirical focus in the nominal domain, let us now move to the verbal domain.

2.2. Semelfactives

Semelfactives are a very frequent verbal category attested in all branches of Slavic (e.g., Armoškaitė & Sherkina-Lieber, 2008; Arsenijević, 2006; Biskup, 2023a, 2023b; Kagan, 2008; Kwapiszewski, 2020, 2022; Łazorczyk, 2010; Markman, 2008; Matushansky, 2024; Milosavljević, 2023; Nesset, 2013; Nordrum, 2020; C. Smith, 1991; Štarkl et al., 2025; Taraldsen Medová & Wiland, 2019; Wiland, 2019). Slavic semelfactive morphology was argued to mark a number in the verbal domain and express eventive singularity and, thus, contrasts with event internal iteratives marked with the theme vowel -A (Armoškaitė & Sherkina-Lieber, 2008; see also Milosavljević, 2023).[4] The suffix -NU, which is responsible for semelfactive formation, in different Slavic languages and/or phonological contexts can take the shape *-nu*, *-nou*, *-nq*, *-ni*, etc. Table 2 provides an overview of the iterative/semelfactive distinction

across all branches of Slavic. Though there are important differences between individual Slavic languages,[5] in this paper, I will ignore them and focus on overall similarities.

Table 2. Semelfactives in Slavic.

Group	Language	Gloss	Iterative	Semelfactive
East Slavic	Belarusian	'to kick'	kapac'	kap**nu**c'
	Russian	'to jump'	prygat'	pryg**nu**t'
	Ukrainian	'to knock'	stukaty	stuk**nu**ty
West Slavic	Czech	'to click'	klikat	klik**nou**t
	Polish	'to sneeze'	kichać	kich**ną**ć
	Upper Sorbian	'to fall'	padać	pad**ny**ć
South Slavic	BCMS	'to slap'	lupati	lup**nu**ti
	Bulgarian	'to blink'	migam	mig**n**a
	Slovenian	'to wave'	mahati	mah**n**iti

The suffix -NU attaches to bases that can be viewed as describing events that typically occur in series. For this reason, I assume that the bases such as those in Table 2 are inherently iterative, i.e., denote eventualities that are conceptualized as allowing for multiple (quick) repetitions and are often experienced this way. The result of the -NU suffixation is a punctual verb designating a very brief event that constitutes an instantaneous action, which at its endpoint returns to the initial state. For instance, the Ukrainian verb *stukaty* 'to knock (repeatedly)' does not describe a singular knocking event, but rather a plurality thereof. In contrast, the derived semelfactive form *stuknuty* 'to knock once' would be true of a single knock. Likewise, Bosnian/Croatian/Montenegrin/Serbian (BCMS) *lupati* 'to slap (repeatedly)' and Slovenian *mahati* 'to wave (repeatedly)' are iterative verbs denoting multiple occurrences of an action (typically in a series), whereas their semelfactive equivalents *lupnuti*, 'to slap once', and *mahniti*, 'to wave once', designate a singular slapping and waving event, respectively.

Across Slavic languages, semelfactive NU-verbs can be either accusative or unergative and their stems involve roots that also derive nominals (Taraldsen Medová & Wiland, 2019). This is illustrated by the Polish examples in (10), where *kop* 'kick' and *syk* 'hiss' are both attested nouns in the language.

(10) a. Jacek kop-**ną**-ł piłkę.
Jacek kicked-SMLF-PST ball.ACC
'Jacek kicked the ball.'

b. Jacek syk-**ną**-ł.
Jacek hiss-SMLF-PST
'Jacek hissed.' (Polish, Taraldsen Medová & Wiland, 2019)

Notice that, similar to -IN, -NU also does not derive exclusively semelfactives but also other types of verbs. Its other functions across Slavic that should be mentioned include, e.g., imperfective degree achievement derivation, illustrated in (11), and plain activity formation, as in (12) (Taraldsen Medová & Wiland, 2019; Wiland, 2019). There are important lessons that can be learnt from examining similarities and differences between semelfactives and verbs such as those in (11)–(12), e.g., stems of NU-degree achievements are always unaccusative and have adjectival roots (Taraldsen Medová & Wiland, 2019).

(11) slepý ∼ slep-**nou**-t
blind ∼ blind-NU-INF.IMPF
'blind' ∼ 'to become blind' (Czech, Taraldsen Medová & Wiland, 2019, p. 1477)

(12) tisk ∼ tisk-**nou**-t
print ∼ guy-NU-INF.IMPF
'print' ∼ 'to print' (Czech, Taraldsen Medová & Wiland, 2019, p. 1480)

Again, in this paper, I do not intend to investigate all uses of -NU and how they relate; however, there are proposals attempting to account for the multifunctionality in question. For instance, Taraldsen Medová & Wiland (2019) argue that there is a containment relationship between semelfactives and degree achievements such as (11), namely, that the former contain the latter. Nevertheless, due to a limited scope, this paper concerns only bona fide semelfactives depicted in (6) and Table 2.

Having discussed the basic characteristics of singulative nouns with -IN and semelfactive verbs with -NU, let us now investigate some more interesting properties. In what follows, I will focus on data highlighting the analogies between the two categories in question.

2.3. Parallels

Mehlig (1994) suggested that on a conceptual level, semelfactives are, in principle, the verbal counterpart of the category of singulatives. The goal of this section is to examine to what extent the idea concerning the analogy between semelfactives and singulatives goes beyond conceptual considerations and is supported by grammatical parallelism. Specifically, I will discuss five analogies between Slavic singulatives and semelfactives that regard their syntactic and semantic properties.

The first analogy concerns a non-trivial constraint on the formation of singulatives and semelfactives.[6] Recent research revealed that in Slavic, singulativization via -IN turns out to be restricted to a subset of uncountable nouns (Geist et al., 2023; Kagan, 2024; Kagan & Nurmio, 2024; Wągiel & Shlikhutka, 2023a, 2023b; see also Grimm, 2012, 2018). As already stated in Section 2.1, -IN only attaches to bases that convey an aggregate semantics, i.e., describe entities that typically occur in collections whose constituents are either spatially connected to each other or remain in close and predictable proximity. As such, they are conceptualized as clusters, i.e., spatially structured pluralities of objects. Some representative examples are given in Table 3, which provides an overview of singulative bases in Ukrainian.

Table 3. Classification of Ukrainian singulatives.

	Granulars	**Artifacts**	**Vegetables**	**Precipitation**
BASE	žyto 'rye'	posud 'dishes'	morkva 'carrot (mass)'	rosa 'dew'
SGV	žyt**yn**a 'a grain of rye'	posud**yn**a 'a dish'	morkv**yn**a 'a carrot'	ros**yn**a 'a dew drop'

Ukrainian and other East Slavic languages form singulatives for many uncountable granular nouns with multiple examples of cereals, e.g., *žyto* 'rye' is the base for *žytyna* 'a grain of rye', but also sand, sugar, beads, pearls, etc. Another class of frequent bases for the singulative formation with -IN involves object mass nouns describing artifacts that typically occur or are stored in heaps and piles, e.g., *posud* 'dishes (as a mass)' is an uncountable noun that serves as a base for its singulative counterpart *posudyna* 'a dish', which denotes a singular discrete object. Similarly, many names of vegetables that are grown or stored in collections and bunches are object mass nouns in Ukrainian, e.g., *morkva* 'carrot (as a mass)' can be used to describe any amount of carrots in any form (both individuated as discrete entities and conceptualized as a mass), whereas *morkvyna* 'a carrot' is true of a single item of the vegetable.[7] Finally, mass nouns designating precipitation can also form singulatives, e.g., *rosa* 'dew' and the derived form *rosyna* 'a dew drop'. Also, in this case, the base refers to a collection of drops, flakes, stones, etc., and not a homogeneous body of a substance. Thus, -IN always attaches to an aggregate base, which typically designates clustered objects, and forms a countable concrete unit noun that refers to a discrete object individuated from a cluster.

In a similar vein, the Slavic semelfactive -NU attaches to bases that convey an iterative meaning, which typically describe quick repetitive events that often appear in series. Since a series is essentially a temporally structured plurality, its structure very much parallels that of a spatial cluster, just in a different domain (Wągiel, 2023a). The result of the semelfactive derivation is a punctual verb that designates a singular individuated event. Table 4 gives an overview of typical bases for unprefixed semelfactives in Polish.

Table 4. Classification of Polish unprefixed semelfactives.

	Onomatopoeia	**Sounds**	**Body Moves**	**Natural Phenomena**
ITR	klikać 'to click'	jęczeć 'to moan'	machać 'to wave'	buchać 'to burst'
SGV	klik**nąć** 'to click once'	ję**knąć** 'to moan once'	mach**nąć** 'to wave once'	buch**nąć** 'to burst once'

Many semelfactives in Polish and other Slavic languages have onomatopoeic bases, e.g., the iterative verb *klikać* 'to click (repeatedly)' describes series of clicking events, whereas its semelfactive counterpart *kliknąć* 'to click once' denotes singular clicking eventualities.[8] Many other, not necessarily onomatopoeic, semelfactives also designate sounds, e.g., *jęczeć* 'to moan (repeatedly)' would denote series of moans and *jęknąć* 'to moan once' describes singular moans.[9] In both cases, the bases represent events related to the emission of rapid sounds that often occur in series. Another class regards quick repetitive body moves, e.g, *machać* 'to wave (repeatedly)' can only be true of a series of waving moves, whereas *machnąć* 'to wave once' is only true of a single waving event. Finally, there are a number of semelfactives designating natural phenomena such as *buchać* 'to burst (repeatedly)' and *buchnąć* 'to burst once'.[10] In all of the discussed cases, -NU attaches to a base that describes a rapid event that can be easily iterated and often occurs in a series. The result is a punctual verb denoting a single instance of an (iterated) eventuality characterized by the base.

The second parallel concerns countability. It is well known that Slavic singulatives display hallmark properties of count nouns. They can be pluralized and they are compatible with basic cardinal numerals. This is illustrated by the Ukrainian examples in (13), where the nouns derived by -IN combine with the numeral 'two' and take the plural marker. In contrast, as one can see in (14), their aggregate counterparts are not countable and resist numeral modification and pluralization (modulo the well-known cases of the portioning and/or taxonomic coercion).

(13) a. dvi trav-**yn**-y
two grass-IN-PL
'two grass blades'
b. dvi ros-**yn**-y
two dew-IN-PL
'two dew drops' (Ukrainian)

(14) a. *dvi trav-y
two grass-PL
Intended: 'two grasses'
b. *dvi ros-y
two dew-PL
Intended: 'two dews' (Ukrainian)

Similar to singulatives, semelfactives are also countable and, thus, just like other perfective verbs, can be felicitously modified by multiplicatives. For instance, the Polish sentences in (15) describe situations in which Jacek gave two claps (15-a) and two burps (15-b) in the theater, respectively. Hence, in this case, the multiplicative counts singular events denoted by the semelfactive verbs. In contrast, though the corresponding iterative

verbs are also compatible with multiplicatives, the domain of quantification is different since counting does not concern singular events but, rather, pluralities thereof. This is illustrated by the examples in (16), where the multiplicative 'two times' does not quantify over singular clapping (16-a) and burping (16-b) events, respectively, but, rather, over series thereof (see also Wągiel, 2023a).[11] The parallel behavior of semelfactives and singulatives is expected if both categories involve individuation in terms of units.

(15) a. Jacek dwa razy klas-**ną**-ł w teatrze.
Jacek two times clap-NU-PST in theater
'Jacek clapped twice in the theater.'
b. Jacek dwa razy bek-**ną**-ł w teatrze.
Jacek two times burp-NU-PST in theater
'Jacek burped twice in the theater.' (Polish)

(16) a. Jacek dwa razy klaska-ł w teatrze.
Jacek two times clap-PST in theater
'Jacek gave two series of claps in the theater.'
b. Jacek dwa razy beka-ł w teatrze.
Jacek two times burp-PST in theater
'Jacek gave two series of burps in the theater.' (Polish)

The third analogy concerns the syntactic position of -IN and -NU. As argued in the literature, both appear to be very low in the structure. For -IN, it is below the number and probably just above the root inside the nP (Geist et al., 2023; Kagan & Nurmio, 2024). Likewise, -NU seems to occupy a structurally low event internal position, below higher aspectual projections (Arsenijević, 2006; Biskup, 2023a, 2023b; Borer, 2005b; Milosavljević, 2023). This structural analogy suggests that the semantic contribution of -IN and -NU relates to how an entity/event described by the root is individuated.

The fourth parallel concerns the fact that both singulative and semelfactive meanings show degree interactions; specifically, they can be targeted by scalar modifiers expressed morphologically within the structure of the noun and verb, respectively. In particular, -IN and -NU can combine with pieces of morphology that can be viewed as encoding degree modification. In the case of singulatives, it is the diminutive suffix -K, which conveys size modification, as illustrated by the Russian examples in (17).[12]

(17) a. gorox ∼ goroš-**in**-a ∼ goroš-**in**-**k**-a
pea.SG pea-IN-SG pea-IN-DIM-SG
'peas (as a mass)' ∼ 'a small pea'
b. žemčug ∼ žemčuž-**in**-a ∼ žemčuž-**in**-**k**-a
pearl.SG pearl-IN-SG pearl-IN-DIM-SG
'pearl(s as a mass)' ∼ 'a pearl' ∼ 'a small pearl' (Russian, Kagan & Nurmio, 2024, p. 66)

The semelfactive counterpart of this phenomenon is found in BCMS, where in a number of verbs, -NU can co-occur with the verbal diminutive suffix *-uc*, see (18). The resulting meaning involves the component of a small quantity (Štarkl et al., 2025).

(18) a. prdeti ∼ prd-**nu**-ti ∼ prd-**uc**-**nu**-ti
fart.INF.IMPF fart-NU-INF.PFV far-DIM-NU-INF.PFV
'to fart' ∼ 'to fart once' ∼ 'to fart a little'
b. grebati ∼ greb-**nu**-ti ∼ greb-**uc**-**nu**-ti
scratch.SG scratch-NU-INF.PFV scratch-DIM-NU-INF.PFV
'to scratch' ∼ 'to scratch once' ∼ 'to scratch a little' (BCMS, Štarkl et al., 2025, p. 641)

Relatedly, in Russian, many semelfactive verbs show an additional vocalic segment preceding -NU, thus *-anu* (e.g., Kuznetsova & Makarova, 2012; Makarova & Janda, 2009). In some cases, there exist doublets such as those in (19), where the interpretation of *-anu* verbs differs in a higher degree of intensity (force) of an action (sometimes described as expressivity) compared to their *-nu* counterparts.[13] The contrasts could be interpreted as stemming from *-a* encoding intensifier semantics.

(19) a. stučat' ∼ stuk-**nu**-t' ∼ stuk-**a**-**nu**-t'
knock.INF knock-NU-INF knock-INTS-NU-INF
'to knock' ∼ 'to knock once' ∼ 'to knock once with force'
b. rubit' ∼ rub-**nu**-t' ∼ rub-**a**-**nu**-t'
chop.INF chop-NU-INF chop-INTS-NU-INF
'to chop' ∼ 'to chop once' ∼ 'to chop once with force' (Russian, Kuznetsova & Makarova, 2012, p. 156)

Notice that the placement of the diminutive (or intensifying) suffix differs depending on whether it combines with -IN or with -NU. Specifically, the morpheme order in singulatives is -IN-DIM but -DIM-NU in semelfactives. At first blush, this fact might seem somewhat unexpected under the explored analogy between -IN and -NU. However, as I will show in Section 5.5, both orders are compatible with contemporary approaches to morpheme order and can be derived from a single underlying structure. Thus, the difference in linearization is not a counterargument to their parallelism.

The final shared property to be discussed in this paper is that typically, neither singulatives nor semelfactives combine with derivational morphology that expresses plurality or pluractionality. In particular, -IN is generally incompatible with collectivizing affixes, whereas -NU does not allow for secondary imperfectivization. Interestingly, however, there are several instances across Slavic when both of these combinations are possible. Specifically, Ukrainian allows for secondary collectives which display stacking of singulative and collective morphemes. For instance, in (20) the singulative *-yn* attaches to the aggregate base and is then followed by the collectivizing suffix *-j* (surfacing as *-nj* due to phonological rules) (Wągiel & Shlikhutka, 2023a). Admittedly, this phenomenon is very rare and was only reported in a few nouns in Ukrainian; nonetheless, it is attested and shows that the subsequent combination of singulativization and collectivization within one word formation is not impossible.

(20) popil ∼ popel-**yn**-a ∼ popel-**yn**-**nj**-a
ash.SG ash-IN-SG ash-IN-COLL-SG
'ash' ∼ 'a speck of ash' ∼ '(clustered specks of) ash' (Ukrainian, Wągiel & Shlikhutka, 2023a, p. 202)

An analogous phenomenon was observed in BCMS, where several perfective -NU verbs allow for secondary imperfectivization (Milosavljević, 2023; Štarkl et al., 2025). This is illustrated in (21), where *-nj* is preserved despite the presence of the following suffix *-ava*, which forms the secondary imperfective.[14] Again, cases like this are definitely very marginal, but I argue that they do show the combinatorial potential of the categories in question.

(21) svitati ∼ sva-**nu**-ti ∼ sva-**nj**-**ava**-ti
dawn.INF.IMPF dawn-NU-INF.PFV dawn-NU-IMPF-INF
'to dawn (IMPF)' ∼ 'to dawn (PFV)' ∼ 'to be dawning (IMPF)' (BCMS, Štarkl et al., 2025, p. 631)

To conclude this section, the data discussed above indicate that the two categories in question do in fact show parallel behavior in grammar. In particular, I discussed five analogies. The first one concerns similar constraints on their formation. The second one is based on contrasts in terms of countability between singulatives/semelfactives and their corresponding aggregate/iterative counterparts. The third parallel concerns the low position in the structure. The fourth analogy regards degree interactions and compatibility with scalar modifiers and the last one concerns rare cases of stacking morphemes that, at first blush, seem to convey an opposite meaning. In face of the examined evidence, I conclude that a unified treatment of singulatives and semelfactives that would be based on a general individuating mechanism is desirable.

In the next section, I will consider a hypothesis that the singulative -IN and the semelfactive -NU are not morphologically simplex. Rather, they are both structurally complex and involve two morphemes pronounced by the shared nasal component -N and a vocalic segment.

3. Decomposing -NU and -IN

In this section, I argue that there are good reasons to assume that both the semelfactive -NU and the singulative -IN are, in fact, internally complex bimorphemic components with the nasal and the vocalic segment corresponding to two independent morphemes. Notice that for -NU, this idea is by no means new, even if it seems to be a minority view in the literature (for monomorphemic approaches, see, e.g., Armoškaitė & Sherkina-Lieber, 2008; Arsenijević, 2006; Biskup, 2023a, 2023b; Kagan, 2008; Kwapiszewski, 2020, 2022; Markman, 2008; Progovac, 2005; Schoorlemmer, 2004; Svenonius, 2004; see also Matushansky, 2024).

For instance, Łazorczyk (2010) analyzes the Polish suffix *-ną* as consisting of two morphemes, specifically, the semelfactive marker *-n* and a theme vowel, which reflects verbalization through the structure, i.e., it is inserted after the projection of the inner aspect. Furthermore, Taraldsen Medová & Wiland (2019) and Wiland (2019), in their nanosyntactic approach to the Czech semelfactive suffix *-nou*, propose an account under which *-n* is analyzed as a lexical item storing the structure that involves a projection corresponding to the light verb give, while the vocalic component is treated as a theme vowel. This results in a semelfactive semantics corresponding to analytic constructions such as *give a kick* and *give a shout*. Finally, based on BCMS and Slovenian data, Štarkl et al. (2025) decompose -NU into the diminutive suffix *-n* with a floating vocalic part (see also Zdziebko, 2017) and a theme vowel, which realizes the verbal category. The morpho-phonological evidence for their approach comes from the contrasts between infinitives and past forms, on the one hand, and present tense and imperative forms, on the other. This is illustrated with the BCMS example in (22), where *-u* surfaces before the consonant-initial ending in (22) in order to prevent a consonant cluster but does not surface in front of the vowel-initial ending in (22) since this would result in a hiatus.

(22) a. max-n^{u}-∅-ti → { maxnuti / *maxnti }
wave-NU-TH-INF
'to wave'

b. max-n^{u}-**i**-mo → { maxnimo / *maxnuimo }
wave-NU-TH-1.PL.IMP
'let's wave!' (BCMS, Štarkl et al., 2025, p. 633)

In contrast, to the best of my knowledge, the singulative -IN has never been treated in the literature as a morphologically structured complex but, rather, as a single morpheme. However, in this context, it is worth noticing that Kagan & Nurmio (2024) observe a non-trivial interaction between the singulative *-in* and the diminutive *-k* in Russian (see

(23)), which might be viewed as indicating structural complexity. In particular, the authors emphasize the distinction between the compositional *-in-k*, illustrated in (23-a), and the non-compositional *-ink* (23-b), which motivates a different structural and semantic treatment based, nonetheless, on the same individuating component.

(23) a. žemčug ∼ žemčuž-**in**-a ∼ žemčuž-**in**-**k**-a
pearl.SG pearl-IN-SG pearl-IN-DIM-SG
'pearl(s as a mass)' ∼ 'a pearl' ∼ 'a small pearl'
b. ris ∼ *ris-**in**-a ∼ ris-**in**-**k**-a
rice.SG rice-IN-SG rice-IN-DIM-SG
'rice' ∼ intended: 'a grain of rice' ∼ 'a grain of rice' (Russian, Kagan & Nurmio, 2024, p. 80)

Kagan & Nurmio (2024) view the non-compositional *-ink* as an instance of affix telescoping, i.e., a fusion of two derivational affixes (Stump, 2022). Nevertheless, on the assumption that the phonological identity of *-in* and *-k* in both cases in (23) is not a coincidence, these facts could also be interpreted as suggesting differences in structural complexity within -IN (in the sense that it might spell out more than one syntactic head), which might result in different interactions with *-k*.

Relatedly, Simonović et al. (2024) consider examples like (24) and decompose -IN in such cases, which is traditionally considered a single singularity morpheme, into the plurality-marking -I and -N, which derives the singular form out of the plural one. Given recent proposals that the Slavic derived singular forms such as (24) and proper -IN singulatives are related (Geist and Kagan, 2023; Wągiel, 2023b), this further suggests the structural complexity of -IN.

(24) a. Bugar-i ∼ Bugar-**i**-**n**
Bulgarian-PL Bulgarian-I-N
'Bulgarian people' ∼ 'a Bulgarian person'
b. Kanađan-i ∼ Kanađan-**i**-**n**
Canadian-PL Canadian-I-N
'Canadian people' ∼ 'a Canadian person' (BCMS, Simonović et al., 2024, s. 25)

Let us then discuss morphological evidence suggesting that a bimorphemic analysis of both -NU and -IN is, in fact, plausible. In the following sections, I will discuss exclusively Czech data. Of course, one might expect important cross-Slavic differences (something to focus on in future research) and I definitely do not want to downplay their significance. However, my aim here is to demonstrate that Czech evidence indicates that the decomposition of -NU and -IN is not inconceivable even on purely morphological grounds.

3.1. Internal Complexity of -NU

Let us begin with examining morphological evidence suggesting the internal complexity of -NU. As already mentioned above, I will argue based on Czech data, specifically Czech verbal conjugation and present tense forms. The argument is based on the comparison between tense forms of Czech -NU semelfactives and non-semelfactive perfective verbs ending in *-out*. For instance, consider the two verbs in (25). Morphologically, the third person singular future tense forms *vyplu-je* and *zu-je* are arguably *vyplu-e* and *zu-e*, respectively, accompanied with glide insertion due to Czech phonological constraints on the adjacent vowels co-occurrence (e.g., Rubach, 2000).

(25) a. vyplou-t ∼ vyplu-l ∼ vyplu-**je**
set.sail-INF.PFV set.sail-3.SG.M.PST set.sail-3.SG.FUT
'to set sail' ∼ '(he) set sail' ∼ '(s/he) will set sail'

b. zou-t ∼ zu-l ∼ zu-**je**
take.off-INF.PFV take.off-3.SG.M.PST take.off-3.SG.FUT
'to take off (shoes)' ∼ '(he) took off' ∼ '(s/he) will take off' (Czech)

If -NU were a single morphological unit, then one would expect that the relevant semelfective future tense forms in third person singular should take the same shape as non-semelfective verbs like *vyplout* and *zout*, i.e., they should pattern with (25). However, as witnessed in (26), this expectation is not borne out. Instead, no glide insertion appears and *u* does not surface, unlike in (25).

(26) a. kop-**nou**-t ∼ kop-**nu**-l ∼ *kop-**nu-je** /
kick-NU-INF.PFV kick-NU-3.SG.M.PST kick-NU-3.SG.FUT
kop-**n-e**
kick-N-3.SG.FUT
'to kick (once)' ∼ '(he) kicked' ∼ '(s/he) will kick'

b. bod-**nou**-t ∼ bod-**nu**-l ∼ *bod-**nu-je** /
stab-NU-INF.PFV stab-NU-3.SG.M.PST stab-NU-3.SG.FUT
bod-**n-e**
stab-N-3.SG.FUT
'to stab (once)' ∼ '(he) stabbed' ∼ '(s/he) will stab' (Czech)

Admittedly, there are only several Czech verbs ending with *-out* that show the behavior in (25). However, I believe that the contrast between (25) and (26) is quite telling in that it shows that the phonological quality of the stem-final *ou*/*u* is not sufficient to predict the correct inflectional pattern. This, in turn, suggests that the is morphological and points to the structural complexity of -NU as a possible explanation of the contrast. Therefore, I conclude that it is not implausible that -NU consists of two morphological components: the nasal -N and the vocalic segment -U.

3.2. Internal Complexity of -IN

Having discussed -NU, let us now examine morphological evidence indicating that also -IN is structurally complex. Notice that in order to demonstrate this, I will need to go beyond singulatives. It is important to emphasize that across Slavic languages, -IN is a multifunctional element and in addition to its singulative use, it also has a number of other functions. To show that -IN can be segmented into two components, I will again focus on Czech data and consider two environments in which the element in question appears. Specifically, I will examine structural properties of -IN in hypocoristics and diminutive adjectives.

Of course, the hypocoristic function and the diminutive function are different from the singulative one. However, it is often assumed that the three meanings in question are related since cross-linguistically they are often expressed by the same morphology (see, e.g., Acquaviva, 2015; Asmus & Werner, 2015; Cinque, 2015; De Belder, 2011; Kagan & Nurmio, 2024; Nurmio, 2023). There is also semantic and syntactic evidence. Intuitively, the relationship between diminutivization and endearment seems straightforward and the two notions are assumed to be expressed by structurally adjacent heads (Cinque, 2015).[15] Likewise, size predication seems to require individuation in terms of spatial boundedness, a feature associated with countability (see, e.g., Wągiel, 2021b, Chapter 5). Moreover, size adjectives such as *small* denote stubbornly distributive predicates, which presupposes unit reference (Schwarzschild, 2011). And again, according to the syntactic literature, the notions of diminutivization and individuation are taken to be encoded by structurally adjacent nodes (De Belder, 2011).[16] Though I remain agnostic with respect to the exact nature of the relationship in question, both empirical evidence and theoretical considerations indicate that there are good reasons to assume that the three functions are related both in syntactic and

semantic terms.[17] Hence, what is important for our purposes is that if -IN is decomposable in at least some of the morphological contexts under discussion, this fact can shed light on its status also in the singulative use.

Having established the relevance of the two environments introduced above, let us discuss the evidence for the internal complexity of -IN in these contexts. The first class to be investigated consists of hypocoristics depicted by the examples in (27). These nouns are derived from human or animal proper names and kinship terms. The root is followed by -IN, which is then followed by the diminutive suffix *-k* and a nominal inflectional marker. Hypocoristic forms express affection for the person or the animal referred to by the proper name or the kinship term, as indicated by the translations.

(27) a. Luc-ie ∼ Luc-**in**-k-a
Lucie-INFL Lucie-IN-DIM-INFL
'Lucie' ∼ '(little) dear Lucie'
b. mám-a ∼ mam-**in**-k-a
mom-INFL mom-IN-DIM-INFL
'mom' ∼ 'mommy' (Czech)

The first piece of evidence comes from the hypocoristic data in (28), which demonstrate that the vocalic component of -IN does not need to be *-i* and can be replaced by another vowel, namely, *-u* or *-e*, as illustrated in (28-b) and (28-c), respectively. That the alternation is not phonologically determined is evidenced by the existence of doublets such as (28-d), where *-i* in *dceřinka* triggers palatalization on the preceding sonorant, whereas *-u* in *dcerunka* does not. Therefore, the evidence indicates that at least in some cases, the vocalic component of -IN is variable in a way that is independent of phonological constraints, thus suggesting morphological complexity.

(28) a. Luc-ie ∼ Luc-**in**-k-a
Lucie-INFL Lucie-IN-DIM-INFL
'Lucie' ∼ '(little) dear Lucie'
b. Bár-a ∼ Bar-**un**-k-a
Bára-INFL Bára-UN-DIM-INFL
'Bára' ∼ '(little) dear Bára'
c. Dáš-a ∼ Dáš-**en**-k-a
Dáša-INFL Dáša-EN-DIM-INFL
'Dáša' ∼ '(little) dear Dáša'
d. dcer-a ∼ dceř-**in**-k-a ∼ dcer-**un**-k-a
daughter-INFL daughter-IN-DIM-INFL daughter-UN-DIM-INFL
'daughter' ∼ '(little) dear daughter' (Czech)

The second piece of evidence concerns the class of diminutive adjectives of the type illustrated in (29). The adjectival root designating a gradable property, e.g., 'small' or 'short', is followed by -IN, which is subsequently followed by the diminutive suffix *-k* and an adjectival inflectional marker. Compared to their unmarked counterparts, the diminutive adjectives have an emphatic and intensified meaning corresponding roughly to the semantics of APs modified by 'very', as indicated by the translations in (29) (cf. Dočekal & Kučerová, 2011).

(29) a. mal-ý ∼ mal-**in**-k-ý
small-INFL small-IN-DIM-INFL
'small' ∼ 'very small'
b. krátk-ý ∼ krat-**in**-k-ý
short-INFL short-IN-DIM-INFL
'short' ∼ 'very short' (Czech)

Now, what is crucial for our purposes is the process of recursive diminutive adjective formation (cf. Dočekal & Kučerová, 2011), which demonstrates that the vocalic and the nasal components can be separated by the insertion of an interrupting morpheme. This happens when the suffix *-li* applies to a diminutive adjective of the type in (29), which gives rise to expressions, whose meanings could be viewed as equivalent to 'very, very' APs, as illustrated in (30).

(30) a. mal-ý ∼ mal-**in**-k-ý ∼ mal-**i**-li-**n**-k-ý
small small-IN-DIM-INFL small-I-DIM$_1$-N-DIM$_2$-INFL
'small' ∼ 'very small' ∼ 'very very small'

b. ten-k-ý ∼ ten-**oun**-k-ý ∼ ten-**ou**-li-**n**-k-ý
thin thin-OUN-DIM-INFL thin-OU-DIM$_1$-N-DIM$_2$-INFL
'thin' ∼ 'very thin' ∼ 'very very thin'

c. ten-k-ý ∼ ten-**in**-k-ý ∼ *ten-**i**-li-**n**-k-ý
thin thin-IN-DIM-INFL thin-I-DIM$_1$-N-DIM$_2$-INFL
'thin' ∼ 'very thin' ∼ intended: 'very very thin' (Czech)

There are three important observations regarding (30) that are relevant for our aims. First, the data again show that the vocalic component in -IN can alter; specifically, it can be either *-i* or *-ou*. Moreover, the existence of doublets such as *teninký* ∼ *tenounký* 'very thin' in (30-b) and (30-c), respectively, indicates that the alternation is not phonologically governed. Second, as witnessed in the examples, *-li* does not attach after *-in/-oun* as a whole but, rather, it is inserted in between the vowel and the nasal. This shows again that plausibly -IN is composed of two morphological units.

One could object that an alternative analysis of the data in (30-a) and (30-b) is conceivable, namely the decomposition *mal-il-**in**-k-ý* and *ten-oul-**in**-k-ý*, respectively, where -IN is not separated by an inserted morpheme and, thus, preserved as an uniterrupted string. However, the fact that under certain circumstances, the suffix *-li* can be reduplicated (Dočekal & Kučerová, 2011) indicates that this alternative decomposition is incorrect. To see why, consider (31). In both (31-a) and (31-b), it is *-li* that is reduplicated and a hypothetical form with the reduplicated *oul*, i.e., **tenouloulinký*, is conspicuously ungrammatical.

(31) a. mal-**i**-li-**n**-k-ý ∼ mal-**i**-li-li-**n**-k-ý
small-I-DIM$_1$-N-DIM$_2$-INFL small-I-DIM$_1$-DIM$_1$-N-DIM$_2$-INFL
'very very small' ∼ 'very very very small'

b. ten-**ou**-li-**n**-k-ý ∼ ten-**ou**-li-li-**n**-k-ý ∼
thin-OU-DIM$_1$-N-DIM$_2$-INFL thin-OU-DIM$_1$-DIM$_1$-N-DIM$_2$-INFL
*ten-oul-oul-**in**-k-ý
thin-OUL-OUL-IN-DIM-INFL
'very very thin' ∼ 'very very very thin' ∼ intended: 'very very very thin'

Finally, the contrast between the examples in (30-b)–(30-c) demonstrates a morphological difference. Specifically, in the cases of existing *-i*/*-ou* doublets, only *-ou* forms license the suffix *-li*, while *-i* forms do not.[18] Notice that though *-li* does appear in (30-a), it is not the case that there exists the form **malounký*. In this paper, I will leave the exact distribution of *-li* unexplored; however, I take the fact that it is constrained in the case of doublets to suggest a structural difference between *-ou* and *-i* in the discussed examples, which further corroborates their linguistic status as morphemes.

Let us then recapitulate the properties of -IN in Czech hypocoristics and diminutive adjectives. First, the vocalic component can alter in ways that are not due to phonological constraints. Second, it is possible to insert morphological material between the vocalic segment and the nasal. Finally, depending on its quality, the vocalic segment seems to be able or unable to license a morphological operation. The discussed observations

taken together receive a straightforward explanation if -IN is analyzed not as a single morphological unit but, rather, as a linguistic object with a more complex internal structure. Therefore, it seems natural to conclude that -IN is a component that actually consists of two morphemes. Given the relationship between diminutives, hypocoristics and singulatives discussed at the beginning of this section, I argue that this conclusion applies also to the singulative -IN.

The overall conclusion is that irrespective of conceptual considerations, there are morphological reasons to assume that -NU and -IN are composed of two elements: the shared -N component and a vocalic segment. I take this result to indicate that Slavic semelfactives and singulatives display parallelism not only in general conceptual terms and in terms of their syntactic/semantic behavior, but also at the very basic morphological level of their building blocks.

In the next section, I will introduce a mereotopological framework that will be used to develop a unified semantic analysis of semelfactives and singulatives, which is based on the idea that both the semelfactive and singulative meaning utilize the very same individuation mechanism. According to the proposal, in Slavic this mechanism is expressed by -N, the nasal component shared by the two categories in question.

4. Mereotopology of Individuals and Events

In order to develop a unified account for different types of structured part–whole configurations in the domains of individuals and events and, thus, capture the parallel between singulatives and semelfactives, I adopt mereotopology, which is a theory of parts and wholes that extends mereology with topology (Casati & Varzi, 1999). This means that, unlike standard mereology, mereotopology considers not only the part–whole relation, but also notions such contiguity and connection. Modern conceptual origins of the theory trace back to work by Whitehead (1920, 1929), but it was formalized by Clarke (1981) (see also, e.g., Roeper, 1997; B. Smith, 1996; Varzi, 2007). The framework was first applied to natural-language semantics by Grimm (2012) and, since then, it was repeatedly utilized to account for various phenomena in nominal semantics including, e.g., atomizers such *grain* (Scontras, 2014), notional mass nouns (Lima, 2014), partitive constructions (Wągiel, 2021b, 2022b), classifier constructions (Schvarcz & Wohlmuth, 2021), object mass nouns (Sutton & Filip, 2021), spatial collectives (Grimm & Dočekal, 2021; Wągiel, 2021a), adjectives such as *whole* (Igel, 2021), multipliers like *double* (Wągiel, 2022a), clustered plurals (Gréa, 2023) and singulatives (Grimm, 2012; Kagan, 2024; Wągiel & Shlikhutka, 2023a). Following Wągiel (2023a), I will extend the mereotopological approach also to event semantics.

4.1. Framework

In mereotopology, the standard mereological notion of PARTHOOD ($\sqsubseteq$) is augmented with the topological notion of CONNECTEDNESS (C), which is a reflexive and symmetric relation (see (32-b) and (32-b)), respectively (Casati & Varzi, 1999).

(32) a. $\forall x[\mathrm{C}(x,x)]$ REFLEXIVITY
b. $\forall x \forall y[\mathrm{C}(x,y) \leftrightarrow \mathrm{C}(y,x)]$ SYMMETRY

C is implied by OVERLAP (O) and incorporated into the system via the so-called bridging principles in (33), which provide the basis for mereotopological structures (Varzi, 2007, p. 53).

(33) a. $\forall x \forall y[x \sqsubseteq y \rightarrow \mathrm{C}(x,y)]$ INTEGRITY
b. $\forall x \forall y[\mathrm{O}(x,y) \rightarrow \mathrm{C}(x,y)]$ UNITY
c. $\forall x \forall y[x \sqsubseteq y \rightarrow \forall z[\mathrm{C}(z,x) \rightarrow \mathrm{C}(z,y)]$ MONOTONICITY

As a result, one can contrast purely mereological structures, which are based exclusively on $\sqsubseteq$, with mereotopological structures, which are based on the interaction between $\sqsubseteq$ and C. In other words, while classical mereology has no means to distinguish between different arrangements of parts within a whole, mereotopology allows for capturing various types of spatial configurations of entities.

4.2. Integrated Entities

The general framework described above allows for defining more complex mereotopological notions, which are useful for modeling various topological configurations of parts within a given part–whole structure. As a result, it is possible to distinguish formally between different types of ontological objects depending on their mereotopological structure. One distinction that has proven very advantageous in semantics is the distinction between entities that are conceptualized as integrated wholes and those that are not, including unstructured pluralities of objects and amorphous substances.

The distinction plays a significant role in human cognition and it relates to the intuition that an integrated entity forms a coherent whole whose parts are joined. Thus, an integrated whole has a natural boundary and moves across space along continuous paths. In order to capture these intuitions, mereotopology offers the notion of SELF-CONNECTED (SC) in (34), which states that an entity is self-connected if any two parts that form the whole of that entity are connected to each other (Casati & Varzi, 1999, p. 57).[19]

$$\text{(34)} \quad \text{SC}(x) \stackrel{\text{def}}{=} \forall y \forall z[\forall w(\text{O}(w,x) \leftrightarrow (\text{O}(w,y) \vee \text{O}(w,z))) \rightarrow \text{C}(y,z)]$$

However, it has been realized that the definition in (34) is too weak to capture the essential property of integrated wholes. The reason is that it does not rule out configurations of entities that merely touch each other. For instance, consider two spheres arranged in such a way that their boundaries are externally connected at one point. Intuitively, we would not call such a sum an integrated whole, and, thus, the stronger notion of STRONGLY SELF-CONNECTED (SSC) is required. The definition in (35) ensures that an entity is strongly self-connected if it is self-connected and its interior (INT), i.e., the sum of its internal parts, is also self-connected (Casati & Varzi, 1999, pp. 58–60).

$$\text{(35)} \quad \text{SSC}(x) \stackrel{\text{def}}{=} \text{SC}(x) \wedge \text{SC}(\text{INT}(x))$$

Nonetheless, (35) also needs to be amended in order to guarantee maximality. Specifically, among many SSC entities within a part–whole structure, e.g., contiguous proper parts of a sphere, only the largest such entity is taken to be the integrated whole, i.e, the entire sphere. Moreover, we want integrity to be relativized to a particular property, rather than defined in absolute terms.[20] These two intuitions are captured by the mereotopological property of MAXIMALLY STRONGLY SELF-CONNECTED (MSSC). The formulation in ((36)) defines an integrated whole with respect to a property P as a maximal entity that satisfies P whose every (internal) part is connected to (overlaps) the whole (SSC) (Casati & Varzi, 1999, p. 60).

$$\text{(36)} \quad \text{MSSC}(P)(x) \stackrel{\text{def}}{=} P(x) \wedge \text{SSC}(x) \wedge \forall y[P(y) \wedge \text{SSC}(y) \wedge \text{O}(y,x) \rightarrow y \sqsubseteq x]$$

With the notion of MSSC defined in (36), it is possible to go beyond the kinds of ontology delivered by classical mereology and make an ontological distinction between integrated objects modeled as MSSC entities and topologically unstructured entities such as arbitrary sums of MSSC objects. However, it is also possible to distinguish yet another type of entities that have a mereotopologically complex internal structure. These entities are called clusters.

4.3. Clustered Entities

While some collections of entities are viewed just as arbitrary sums, others may be conceptualized as clustered, i.e., topologically structured, configurations. What such clustered entities share with arbitrary sums is that they both involve pluralities of individuated units that are discrete objects in their own right. On the other hand, clusters resemble integrated wholes in that the internal structure of their parts is defined in mereotopological, rather than purely mereological, terms. Specifically, clusters consist of externally connected constituent parts that either touch each other or remain in close and stable proximity.

Conceptually, the distinction seems to be straightforward. Previous research demonstrated that it is also relevant for grammar. For instance, Grimm (2012) observes that cluster-denoting predicates license singulative morphology in Welsh. Grimm & Dočekal (2021) and Wągiel (2021a) show that certain Slavic suffixes derive cluster-denoting collectives. Furthermore, based on French data, Gréa (2023) argues for distinguishing between regular and clustered plurals. What is important for the purposes of this paper are mereotopological proposals that develop the notion of a cluster in order to model the meaning of spatial collectives and aggregate nouns (Grimm & Dočekal, 2021; Kagan, 2024; Wągiel, 2021a; Wągiel & Shlikhutka, 2023a).

In mereotopology, clustered entities can be captured via the notion of TRANSITIVELY CONNECTED (TC) (see Grimm, 2012, p. 144). In this paper, I will build on a revised formulation of this notion, which is given in (37) (Wągiel, 2021a, p. 193). According to the definition, two entities are transitively connected if they are connected through a series of mediating entities without being directly connected to each other. More precisely, x and y are transitively connected relative to a property P, a connection relation C and a sequence of entities Z, when all members of Z satisfy P and x and y are connected through the sequence of mediating entities z_is in Z.

(37) For a finite sequence $Z = \langle z_1, \ldots, z_n \rangle$, $\textsc{tc}(x, y, P, C, Z)$ holds iff
$z_1 = x, z_n = y, \textsc{c}(z_i, z_{i+1})$ holds for $1 \leq i < n$ and $P(z_i)$ holds for $1 \leq i \leq n$.

To illustrate, consider three entities a, b and c in such a topological configuration that a is connected to b, but not to c, and c is connected to b (but not to a). In this configuration, the C relation does not hold between a and c since the two entities are not directly connected. However, the TC relation does hold between them because they are transitively connected via the mediating entity b, which is connected to each of them.

Importantly, the notion of transitive connection and the definition of TC in (37) allows for capturing the concept of CLUSTER (CLSTR) (Grimm, 2012, p. 144). Again, I will adopt a revised formulation of the definition in (38) (Wągiel, 2021a, p. 193). It states that x is a cluster relative to a connection relation C and a property P if and only if x is a sum of entities satisfying P, which are all transitively connected relative to a subset of a set Z under the same property P and connection relation C. To illustrate, the sum of the three entities $a \sqcup b \sqcup c$ in the configuration discussed above is a cluster because constituent parts of that sum are transitively connected.

(38) $\textsc{clstr}_C(P)(x) \stackrel{\text{def}}{=} \exists Z[x = \bigsqcup Z \wedge \forall z \forall z' \in Z \exists Y \subseteq Z[\textsc{tc}(z, z', P, C, Y)]]$

Since a given configuration forms a cluster relative to a particular property, it may be structured by different types of connections (relevant for that property). Some clusters consist of entities that touch each other. In formal terms, such a configuration can be captured by the notion of EXTERNALLY CONNECTED (EC) (see Grimm, 2012, p. 134), which holds of entities that do not share their internal parts but, rather, (parts of) their boundaries. For other properties, a cluster might involve entities that simply remain in close, stable

and predictable proximity without necessarily touching each other. Formally, this can be modeled using the notion of PROXIMATELY CONNECTED (PC) (see Grimm, 2012, p. 135). For instance, we perceive entities in the extension of the aggregate noun *rice* as collections of grains that typically touch each other, whereas in the case of the noun *rain*, we do not expect the drops to be externally connected. Rather, we assume that they merely remain in close proximity without making physical contact. This variation can be accounted for by the C parameter in the definition in (37), which varies across different connection types and, thus, allows to capture what counts as a cluster for a given predicate.

The mereotopological notion of CLSTR in (38) allows us to further refine ontological distinctions and to establish a tripartite categorization. In particular, it is now possible to distinguish between discrete singular objects conceptualized as integrated wholes and pluralities, on the one hand, and two different kinds of pluralities, on the other hand. While arbitrary sums involve no topological constraints on the arrangement of their constituent parts and are, thus, viewed in purely mereological terms, clustered entities form spatially structured aggregates, which are modeled in mereotopological terms as clusters of transitively connected entities.

Notice, however, that the definition of CLSTR in (38) allows for singleton clusters, which are effectively singular entities. This is because if $z = z'$, then the connectedness relation C still holds due to reflexivity (recall (32-a)). In this context, one can draw an analogy with the classical pluralization *-operation (Link, 1983). In other words, singular objects can be viewed as a special case of clusters, just like they can be viewed as a special case of pluralities ($a = a \sqcup a$).

4.4. Events

Previous research in semantics focused almost exclusively on applications of mereotopological concepts within the domain of individuals in order to model natural kinds that are spatial objects (with the notable exception being Wągiel, 2021a's attempt to develop an analysis of social collectives based on the notion of social clusters in the domain of roles; see Zobel, 2017). Nonetheless, as argued by Wągiel (2023a), the connectedness C relation and other mereotopological concepts in general are not restricted to spatial physical objects. They are abstract notions that can be applied also to temporal entities such as events (see, e.g., Mazzola, 2019; Pianesi & Varzi, 1996). Therefore, I adopt a mereotopology of eventualities that will apply the notions of MSSC and CLSTR introduced above within the more abstract domain of events. This, in turn, will allow to model eventive structured part–whole configurations and to capture the parallel between singulatives and semelfactives.

Following a standard neo-Davidsonian approach (e.g. Carlson, 1984; Dowty, 1989; Parsons, 1990), I assume an ontology that includes an independent category of events (of the primitive type v occupying the domain D_v). Adopting a standard view, I take them to be actual entities conceptualized as spatiotemporal particulars (Davidson, 1967). Events typically involve a complex internal structure, which comprises time, location, participating individuals and possibly also other components such as a change of state and the endpoint (*telos*).

I also adopt a standard view that events are associated with individuals that participate in them via thematic roles, e.g., AG (for 'agent'), TH (for 'theme'), INSTR (for 'instrument'), etc. Following Champollion (2017), I take thematic roles to be functions of type $\langle v, e \rangle$, which, for an eventive input, yield an individual that plays the relevant participant role in the event. For example, $\text{AG}(a) = b$ provides the individual b as the agent of the event a. I assume that thematic roles combine with the verbal predicate (type $\langle v, t \rangle$) via silent syntactic heads that attach to the spine of the clause. For example, the agent role is introduced by

the AG head, whose meaning is provided in (39). Typically, the agent argument is then saturated by the meaning of the subject DP.

(39) $[\![\text{AG}]\!] = \lambda P_{\langle v,t\rangle} \lambda x_e \lambda e_v [P(e) \wedge \text{AG}(e) = x]$

I also adopt the standard assumption in event semantics that once the verbal predicate is combined with all its arguments, another projection introduces existential closure, which binds the event argument. This is ensured by the EC head with the semantics in (40). As a result, we obtain a complete proposition.

(40) $[\![\text{EC}]\!] = \lambda P_{\langle v,t\rangle} \exists e_v [P(e)]$

Finally, following the proposals by Bach (1986), Krifka (1998) and many others, I assume that, similar to individuals, events form a mereological structure. Such an eventive part-whole structure then involves pluralities obtained via sum formation in an analogous way as in the domain of individuals. According to standard assumptions, eventive pluralities are not structured in mereotopological terms, i.e., no topological relations are assumed to hold between parts of a whole. Rather, they just form arbitrary sums of events.

In opposition to the view described above, I follow Wągiel (2023a) and argue that the three-way mereotopological distinction between integrated wholes, clusters and arbitrary sums applies also to the domain of events (see also Henderson, 2017; Landman, 2006 for proposals postulating eventive groups and eventive swarms, respectively). Therefore, I assume the mereotopology of events. The conceptual core of the framework is based on two intuitions (see Mazzola, 2019; Pianesi & Varzi, 1996). First, the mereological aspect of the approach is motivated by the fact that it is straightforward to view longer time intervals as being composed from shorter time intervals analogous to wholes being composed from parts. Second, many standard notions concerning time intervals and relations between them, e.g., temporal precedence and overlap, involve implicit mereotopological assumptions. Specifically, the notion of time is implicitly assumed to be linear and gapless. This means that at least the temporal aspect of events requires a mereotopological approach.

Given the above, I assume that the temporal dimension is key for defining an eventive mereotopological structure. Assuming that time is linear and gapless (Mazzola, 2019), events can be conceived of as temporal entities structured by TEMPORAL CONNECTION (TEMP). In the domain of events, the notions of MSSC and CLSTR are, thus, based not on spatial properties, but on the TEMP relation. Together with the above assumptions that time is linear and gapless, TEMP holds between intervals that immediately precede or follow each other. As a notational convention, I will use $\text{MSSC}_{\text{TEMP}}$ and $\text{CLSTR}_{\text{TEMP}}$ to designate properties concerning temporally integrated wholes and temporal clusters, respectively.

5. Proposal

In order to develop a unified account for the relevant types of structured part–whole configurations in the domains of individuals and events, I adopt several general assumptions and components. First, the approach is broadly inspired by the research on the role of clusters in the domain of individuals (Gréa, 2023; Grimm, 2012; Grimm & Dočekal, 2021; Kagan, 2024; Wągiel, 2021a; Wągiel & Shlikhutka, 2023a), on the one hand, and on the previous work postulating the relevance of structured part-whole configurations in the domain of eventualities (Henderson, 2017; Landman, 2006; Moltmann, 1997), on the other. Following Wągiel (2023a), I will model the latter intuition within a mereotopological framework implementing the distinction between MSSC events and eventive clusters. The core idea behind my analysis is then based on three components. First, the meanings of singulatives' and semelfactives' bases correspond to the intuitive notions of clusters of entities and series of events; recall the parallel in (5)–(6), repeated here as (41)–(42). Second,

singulative and semelfactive morphology is based on a general unified mechanism, which individuates via declustering. As a result, both singulatives and semelfactives denote properties of singular discrete objects (modeled as MSSC entities/events) conceived of as units that are individuated from a cluster described by the base.

(41) gorox ∼ goroš-**in**-a
pea.SG pea-SGV-SG
'peas (as a mass)' ∼ 'a pea' (Russian)

(42) prygat' ∼ pryg-**nu**-t'
jump.INF.IMPF jump-SMLF-INF.PFV
'to jump (repeatedly)' ∼ 'to jump once' (Russian)

Based on the mereotopological framework introduced in Section 4, I assume that the connectedness relation C is a general abstract notion that is not restricted to three-dimensional objects but, instead, applies both in the spatial domain and in the temporal domain. The former case is represented as SPAT, which concerns connection between concrete entities of type e, whereas the latter as TEMP, which regards events (type v). The next sections will demonstrate in detail how the parallel semantics of the two categories in question can be implemented.

5.1. Types of Predicates

Let us start by discerning two general types of predicates corresponding to unit nouns and semelfactive verbs, on the one hand, and aggregate nouns and iterative verbs, on the other hand (the distinction builds on and extends the proposals in Wągiel, 2023a; Wągiel & Shlikhutka, 2023a). The first class concerns predicates of singular entities (in the case of nouns) or events (in the case of verbs) that are conceptualized as discrete units. As such, they satisfy the higher-order UNIT_C property in (43), where C is a variable ranging over the spatial (SPAT) and temporal (TEMP) connection types and α ranges over the semantic types e and v. The definition in (43), then, asserts that a predicate is a predicate of MSSC entities or events if all things in its extension are entities or events conceptualized as spatially or temporally, respectively, MSSC wholes relative to the relevant property.

(43) $\text{UNIT}_C(P) \stackrel{\text{def}}{=} \forall x_\alpha[P(x) \rightarrow \text{MSSC}_C(P)(x)]$

For instance, the unit noun *apple* has the meaning in (44), which denotes a set of entities that are maximally strongly self-connected in terms of the spatial connection.

(44) $[\![\text{apple}]\!] = \lambda x_e[\text{MSSC}_{\text{SPAT}}(\text{APPLE})(x)]$

Likewise, the semelfactive verb *knock* has the meaning in (45), which denotes a set of eventualities that are MSSC events relative to the temporal connection TEMP.

(45) $[\![\text{knock}]\!] = \lambda e_v[\text{MSSC}_{\text{TEMP}}(\text{KNOCK})(e)]$

Notice that the proposed semantics goes against the common approach in the semantic literature assuming lexical cumulativity for verbs, i.e., that semantically verbs are inherently plural, which means that whenever two events are in the extension of a verbal predicate, so is their sum (e.g., Kratzer, 2008; Krifka, 1989; Landman, 2000; Lasersohn, 1989; Scha, 1981; Schein, 1993). The motivation behind this assumption is the data such as those in (46), where the entailmemt in (46) patterns with plural count nouns.

(46) a. Kim slept.
b. Tim slept.
c. ⊨ Kim and Tim slept.

In contrast, (45) is true only of discrete singular events (represented as MSSC wholes). Though this approach might be viewed as somewhat controversial given the received view, I argue that it is correct at least for semelfactive verbs (notice, however, that I do not claim that in this respect all verbs are necessarily like semelfactives). There are two reasons. First, the semantics in (45) corresponds neatly to the intuition that semelfactives describe singular momentary eventualities and not pluralities thereof. More importantly, however, in Slavic, the entailment pattern in (46) does not hold due to the obligatory number marking on verbs.

To illustrate, let us consider the Polish data in (47). The sentence in (47-c) does not follow from (47-a) and (47-b). Actually, it is ungrammatical due to the singular form of the semelfactive verb. Instead, the plural form is required, which also licenses the entailment, as demonstrated in (47-d). This indicates that it is incorrect to assume lexical cumulativity for Slavic semelfactives.[21]

(47) a. Tomek kich-ną-ł.
Tomek sneeze-SMLF-PST.SG
'Tomek sneezed.'

b. Romek kich-ną-ł.
Romek sneeze-SMLF-PST.SG
'Romek sneezed.'

c. ⊭ *Tomek i Romek kich-ną-ł.
Tomek and Romek sneeze-SMLF-PST.SG
Intended: 'Tomek and Romek sneezed.'

d. ⊨ Tomek i Romek kich-nę-l-i.
Tomek and Romek sneeze-SMLF-PST-PL
'Tomek and Romek sneezed.' (Polish)

The second class of predicates to be modeled here corresponds to aggregate nouns and iterative verbs and regards clusters of entities or events, respectively. Such predicates satisfy the higher-order AGGR_C property defined in (48), where, again, C ranges over SPAT and TEMP, whereas α ranges over the types e and v. In addition, the formula in (48) involves the classical pluralization operation * (Link, 1983), which is applied after the clustering operation. Hence, according to the definition in (48), a predicate satisfies AGGR_C if its denotation consists of (pluralities of) spatial clusters of entities or (pluralities of) temporal clusters of events.

(48) $\text{AGGR}_C(P) \stackrel{\text{def}}{=} \forall x_\alpha[P(x) \rightarrow {}^*\text{CLSTR}_C(P)(x)]$

To illustrate, the aggregate noun *rice* is interpreted as the predicate in (49), which characterizes a set of entities clustered via the spatial connection SPAT and pluralities of such clusters. Notice, however, that given the definitions of the classical pluralization operator and the clustering operator (recall (38)), the denotation of *rice* also includes singleton clusters (corresponding to individual grains of rice) and pluralities thereof.[22]

(49) $[\![\text{rice}]\!] = \lambda x_e[{}^*\text{CLSTR}_{\text{SPAT}}(\text{RICE})(x)]$

In a similar vein, the iterative verb *rattle* receives the semantics in (50), which denotes a set of (pluralities of) CLSTR events, for which the relevant connection type is the temporal connection TEMP. Again, the denotation includes also singleton temporal clusters and pluralities thereof.

(50) $[\![\text{rattle}]\!] = \lambda e_v[{}^*\text{CLSTR}_{\text{TEMP}}(\text{RATTLE})(e)]$

The denotations in (49)–(50) are intended to capture the intuition that aggregate nouns and iterative verbs designate entities and eventualities that are prototypically conceptual-

ized as spatially/temporally structured groupings, which, in meretopology, are captured as clusters. For this reason, *rice* and *rattle* are commonly used to describe bunches of grains of rice and series of short rapid knocking sounds, respectively. However, depending on the context, they can also refer to other types of part–whole structures. For instance, *rice* would also be true of a singular grain of rice, an unstructured plurality thereof and a plurality of unconnected clusters.[23]

The rich semantics in (49) also accounts for the fact that the predicate denoted by *rice* has the property of cumulative reference. To illustrate, (51) would be true when pointing to, e.g., two unconnected grains of rice, two clusters of rice or to a grain and a cluster, all of which are in the extension of the predicate.

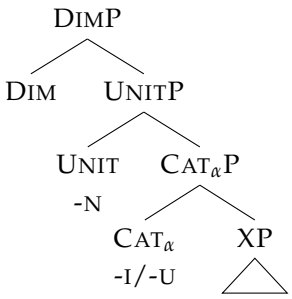
(51) This is rice and this is rice; therefore, these two entities together are rice.

With the mereotopological representations of the meanings of singulative nouns and semelfactive verbs, on the one hand, and aggregate nouns and iterative verbs, on the other, it is now possible to develop the proper account for the semantic contribution of singulative and semelfactive derivational morphology. In the next sections, I will propose a unified compositional analysis based on the notions introduced above. The first step concerns the structural relationship of the relevant components.

5.2. The Underlying Structure

I assume the general underlying structure in (52). The tree represents the relevant parts of singulative and semelfactive expressions, i.e., up to the (optional) diminutive projection (recall (17)–(18) in Section 2.3), with the caveat that I take the representation to be rather schematic and do not claim that it is exhaustive (it is possible that more nodes might be justified). Rather, it is meant to provide the syntactic minimum required for the current proposal.

(52)



In (52), XP is the bottom-most element in the tree, which I take to encode lexically specific meaning (it could be viewed as a root or as a larger structure, depending on additional assumptions; in this paper, I remain agnostic in this respect). Importantly, I assume that the denotation of the XP already encodes a part–whole structure. Specifically, it involves aggregate semantics, i.e., reference to clusters. CAT$_\alpha$ stands for a categorizing head, which could be viewed as *n* in the case of singulatives or *v* for semelfactives, or perhaps as REF (Caha, 2021) and PROC (Ramchand, 2008), respectively. I assume that CAT$_\alpha$ ranges over the heads CAT$_e$ and CAT$_v$, which introduce explicit entity/event semantics to the otherwise ontologically unspecified XP meaning. The UNIT head creates unit reference. Specifically, it contributes individuation via declustering (Grimm, 2012; Wągiel & Shlikhutka, 2023a). Finally, DIM introduces diminutive semantics (see Cinque, 2015). The exact semantic contribution of -I/-U and -N will be discussed in the following sections.[24]

The syntactic part of the proposal is in accordance with the results concerning the internal structure of Slavic singulatives and semelfactives. As already mentioned in Sec-

tion 2.3, Geist et al. (2023) and Kagan & Nurmio (2024) argue that the singulative -IN sits low in the structure, specifically, in their system, inside the *n*P (occupying the *n* slot). The main difference is that I propose to decompose -IN into two components: the categorizing -I element, which sits just above the XP, and the individuating -N element above it. In a similar vein, Borer (2005a) and Arsenijević (2006) (among others) propose that the semelfactive -NU is low in the structure. For instance, Biskup (2023a) argues that it sits in the *v* node. Again, the main difference is that in line with the account by Štarkl et al. (2025), I treat -NU as being structurally complex. Specifically, I analyze -N and -U as separate morphemes. According to my proposal, -U is immediately above the XP and below -N. [25]

Obviously, one thing that needs to be explained concerns linearization, namely, how to derive the actual morpheme orders in semelfactive verbs such as *prducnuti* and singulative nouns like *gorošinka*. But before I demonstrate this in detail in Section 5.5, let us first discuss the semantic contribution of -I/-U and -N and their composition.

5.3. The Meaning of -I/-U *and* -N

As argued in Section 3, I take Slavic singulative and semelfactive morphology (-IN and -NU, respectively) to be structurally complex and I assume that it consists of two functional elements encoded by the nasal component -N and a vocalic segment occupying different positions in the structure in (52). The core idea is that semantically singulatives and semelfactives share the same meaning ingredient pronounced in both cases as -N. The role of this ingredient is essentially to individuate via declustering. The encoded operation is generalized so that it can be applied to entities and events. On the other hand, the vocalic segments -I and -U specify what is being individuated by introducing the entity or event specification, respectively, to the ontologically unspecified semantics of the XP.

First, I assume the denotation of -I and -U to be roughly as in (53) and (54), where the higher-order properties ENTITY and EVENT specify the corresponding semantic type and (*e* or *v*) and connection type (SPAT or TEMP).

(53) $[\![\text{-I}]\!] = \lambda P[\text{ENTITY}(P)]$

(54) $[\![\text{-U}]\!] = \lambda P[\text{EVENT}(P)]$

Furthermore, I propose that the singulative/semelfactive suffix -N denotes a predicate modifier that takes a typically unspecified aggregate predicate and yields a predicate of MSSC entities or events, depending on the type of the input. The denotation is given in (55), where α and C range over the semantic types e and v and the connection types SPAT and TEMP, respectively.

(55) $[\![\text{-N}]\!] = \lambda P_{\langle \alpha,t\rangle\,:\,\text{AGGR}_C(P)}\ \lambda x_\alpha \exists y_\alpha [P(y) \wedge x \sqsubseteq y \wedge \text{MSSC}_C(P)(x)]$

The presupposition in (55) provides a definedness condition, which is a requirement to select a property of clustered entities or events.[26] For such a property, the semantics then yields a set of corresponding MSSC entities or events that originated as parts of the relevant aggregate.

While the role of the vocalic components is to specify the connection type (SPAT vs. TEMP) and the semantic type of the input and output (*e* vs. *v*), the suffix -N introduces the general semantics of individuation via declustering. This gives rise to different denotations depending on what it composes with, though these denotations are clearly very much related. Thus, when -N combines with the meaning of an XP modified by -I, it takes a property of spatial aggregates and returns a property of spatial units conceptualized as MSSC entities. In a similar vein, when it combines with an expression modified by -U, it takes a property of temporal aggregates and yields a property of simplex MSSC events. In

both cases, the resulting expression designates a discrete unit conceptualized as an element individuated from the denotation of an aggregate predicate.

According to the proposal, the denotations of singulatives and semelfactives essentially mirror each other and differ only with respect to the semantic type of the input and output (e vs. v) and the connection type (SPAT vs. TEMP) structuring the relevant part–whole configuration. Admittedly, this is a rather strong claim and it is plausible that further research will reveal asymmetries that will need to be accommodated by diverging the semantics in (53) and (54) or introducing additional components. However, in this paper, I submit the proposed meanings in accordance with the strong hypothesis that the two domains in question are parallel in terms of the kinds of utilized operations. Under this view, the differences result from what these operations apply to.

5.4. Deriving the Singulative and Semelfactive Meaning

With all the pieces in place, let us now demonstrate how the singulative and semelfactive meanings are derived in a parallel manner. Below, I present a simplified analysis that ignores a number of important factors such as number and aspect, etc., that would eventually need to be accommodated within the overall framework. I also neglect much of the structural complexity of the nominal and verbal forms in question and instead restrict my focus to the interaction between the roots and those parts of morphology that seem to express the relevant individuating mechanism.

The composition of the singulative meaning, illustrated by one of the Russian examples in (5), repeated here as (56), is provided in (57)–(58). For simplicity, I assume that the XP (pronounced as *gorox-* with standard palatalization) in (57-a) already encodes the aggregate semantics. Of course, it is possible that the XP is actually complex with the root encoding no part–whole structure at all, as often argued (e.g., Borer, 2005a), and aggregate semantics being introduced higher in the structure within the XP. However, since this question is not crucial for the main point of this paper, I will leave the issue of further structural complexity for future considerations. The categorizing -I then specifies the semantic type and connection type; recall (53), repeated here as (57-b). As a result, we obtain a predicate that denotes a property of (pluralities of) spatial clusters; for readability, called G, see (58-b). As such, it is a legit input for the meaning of -N, as defined in (55) and repeated here for convenience as (57-c). When the two combine, the presupposition requiring an aggregate predicate is satisfied and, as a result, we obtain the meaning in (58-c), which characterizes the set of MSSC pea entities that originated as parts of a spatial cluster (or a plurality of spatial clusters). This is a desired result.

(56) gorox ∼ goroš-**in**-a
pea.SG pea-SGV-SG
'peas (as a mass)' ∼ 'a pea' (Russian)

(57) a. $[\![\text{gorox-}]\!] = \lambda x[{}^{*}\text{CLSTR}_C(\text{PEA})(x)]$
b. $[\![\text{-I}]\!] = \lambda P[\text{ENTITY}(P)]$
c. $[\![\text{-N}]\!] = \lambda P_{\langle \alpha,t\rangle\,:\,\text{AGGR}_C(P)}\, \lambda x_\alpha \exists y_\alpha[P(y) \wedge x \sqsubseteq y \wedge \text{MSSC}_C(P)(x)]$

(58) a. $[\![\text{goroš-i-n-}]\!] = [\![\text{-N}]\!]([\![\text{-I}]\!]([\![\text{gorox-}]\!]))$
b. $[\![\text{-I}]\!]([\![\text{gorox-}]\!]) = \lambda x_e[{}^{*}\text{CLSTR}_{\text{SPAT}}(\text{PEA})(x)]$ (G)
c. $[\![\text{-N}]\!]([\![\text{-I}]\!]([\![\text{gorox-}]\!])) = \lambda x_e \exists y_e[\text{G}(y) \wedge x \sqsubseteq y \wedge \text{MSSC}_{\text{SPAT}}(\text{G})(x)]$

The composition of the semelfactive meaning, illustrated by one of the Russian examples in (6), repeated here as (59), proceeds in an analogous way, as shown in (60)–(61). The XP (*pryg-*) is again assumed here to denote the aggregate semantics in (60-a). After the meaning of -U (recall (54), repeated here as (60-b)) takes it as its argument, we obtain a predicate describing (pluralities of) temporally structured eventive clusters, labeled as

P for readability; see (61-b). As such, it corresponds to the iterative meaning and when combined with -N (recall (55), repeated here as (60-c)), the definedness condition is met and the result is the semantics in (61-c). It is a predicate true of MSSC jumping events that originated as parts of a temporal cluster (or a plurality of temporal clusters). Again, this is the intended meaning.

(59) prygat' ∼ pryg-**nu**-t'
jump.IMPF jump-SMLF-INF
'to jump (repeatedly)' ∼ 'to jump once' (Russian)

(60) a. $[\![\text{pryg-}]\!] = \lambda x[^{*}\text{CLSTR}_C(\text{JUMP})(x)]$
b. $[\![\text{-U}]\!] = \lambda P[\text{EVENT}(P)]$
c. $[\![\text{-N}]\!] = \lambda P_{\langle \alpha,t\rangle\,:\,\text{AGGR}_C(P)}\ \lambda x_\alpha \exists y_\alpha[P(y) \wedge x \sqsubseteq y \wedge \text{MSSC}_C(P)(x)]$

(61) a. $[\![\text{pryg-n-u-}]\!] = [\![\text{-N}]\!]([\![\text{-U}]\!]([\![\text{pryg-}]\!]))$
b. $[\![\text{-U}]\!]([\![\text{pryg-}]\!]) = \lambda e_v[^{*}\text{CLSTR}_{\text{TEMP}}(\text{JUMP})(e)]$ (P)
c. $[\![\text{-N}]\!]\big([\![\text{-U}]\!]([\![\text{pryg-}]\!])\big) = \lambda e_v \exists e'_v[\text{P}(e') \wedge e \sqsubseteq e' \wedge \text{MSSC}_{\text{TEMP}}(\text{P})(e)]$

I assume that in further steps, the singulative and semelfactive expression in (58-c) and (61-c) would combine with additional components further extending their semantics. For instance, the eventive predicate in (61-c) would combine with heads encoding thematic roles and eventually the existential closure (recall (39) and (40), respectively). However, for the sake of simplicity, in this paper, I refrain from developing the entire system and leave its presentation for the future. Yet, I believe that it is rather straightforward to see how (at least some of) the relevant bits would fit.

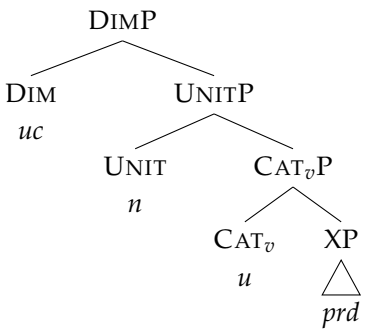
To conclude the compositional part of the proposal, I would like to emphasize the parallel between the singulative and semelfactive semantics. I argue that the fact that the two meanings can be derived by a unified individuating mechanism that is based on mereotopological notions and can be applied both to individuals and to events further supports the view that the analogies between the nominal and verbal domain are not due to a coincidence but, rather, stem from a deep architectural and ontological parallelism.

In the last part of the proposal, I will revisit the issue of linearization signalled already in Sections 2.3 and 5.2. In the next section, I will demonstrate how the differing morpheme orders in singulatives and semelfactives are derived from the single underlying syntactic structure proposed in (52).

5.5. Deriving the Form of Singulatives and Semelfactives

Let us begin with semelfactives since presenting the analysis is less complicated in their case. The derivation will be illustrated with the BCMS diminutive form *prducnuti* 'to fart a little' with the caveat that I will only provide the spellout of the string *prd-uc-n-u-* (the further derivation is rather straightforward). In accordance with (52), the assumed underlying structure is given in (62).

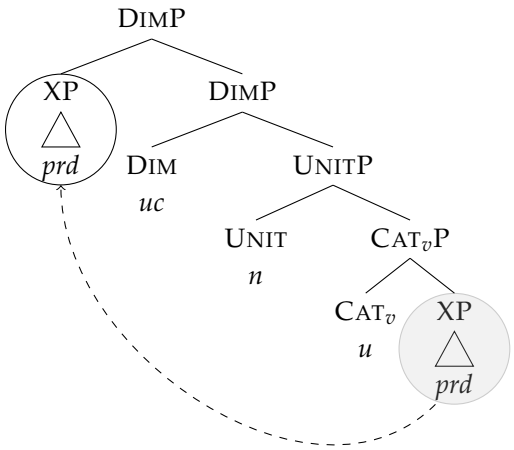
(62)



Notice that the morpheme order in semelfactives is always as follows: The diminutive morpheme (*uc-* in the BCMS example) linearly precedes N-, which is followed by the vocalic segment (*u-*). Thus, the semelfactive morpheme order appears to violate traditional accounts of morpheme order based on head movement and the Mirror Principle (Baker, 1988).

Admittedly, phenomena leading to mirror-image ordering as in the case under investigation are not frequent. However, they are attested and well described in the literature and the type of movement needed for their derivation has been argued independently to be necessary for various morpheme orders within words (e.g., Caha, 2017; Cinque, 2014; Julien, 2002; Koopman & Szabolcsi, 2000; Myler, 2017; Zyman & Kalivoda, 2020). Following these proposals, I argue that the surface order of morphemes is derived from (62) by phrasal movement of the XP to the left of the three functional heads CAT_v, UNIT and DIM, which remain in the base order. Specifically, I adopt the common assumption that movement is only to the left and that in the cases under investigation, it is only possible to move constituents containing the XP (see Cinque, 2005). Under the adopted approach, the XP simply moves above DIM and the result is linearized as *prd-uc-n-u-*, as illustrated in (63).

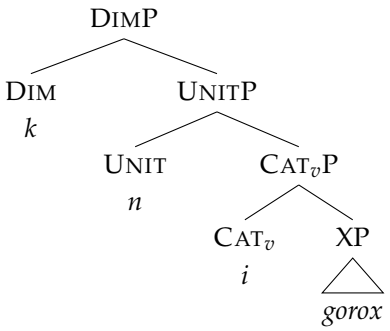
(63)



Though this approach goes against traditional accounts, it is entirely compatible with contemporary morphological frameworks. Further derivation would involve pied-piping of the DIMP above higher projections to yield, e.g., the infinitive form *prd-uc-n-u-ti*.

Having derived the morpheme order for semelfactives, let us now consider singulatives. I will illustrate the spellout with the Russian diminutive example *gorošinka*, 'a little pea'. Again, for space reasons, I will only go through the steps deriving the string *goroš-i-n-k-*. Following (52), I assume the underlying structure in (64).

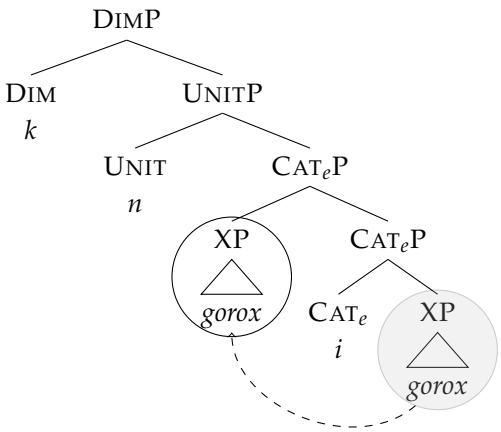
(64)



Compared to semelfactives, the morpheme order in singulatives differs in a systematic way: The diminutive marker (*-k* in the case under investigation) always linearly follows

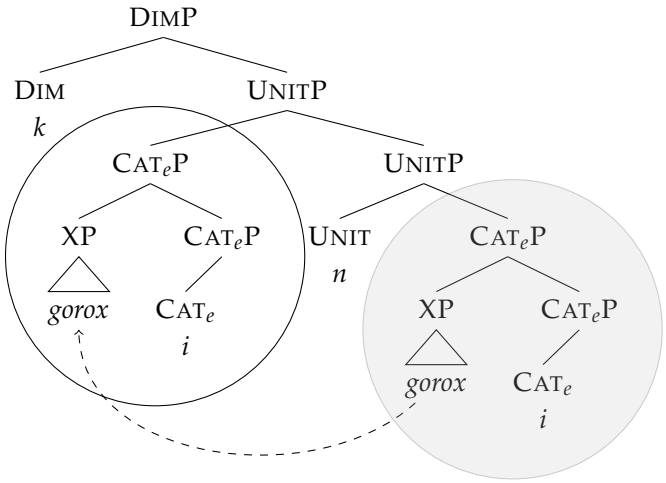
-N, which is always preceded by the vocalic segment (-*i*). Under the assumed account, this morpheme order is derived by successive pied-piping movement in a "roll-up" fashion that reverses the order of the morphemes in (64). First, the XP moves above CAT_e, as illustrated in (65).

(65)



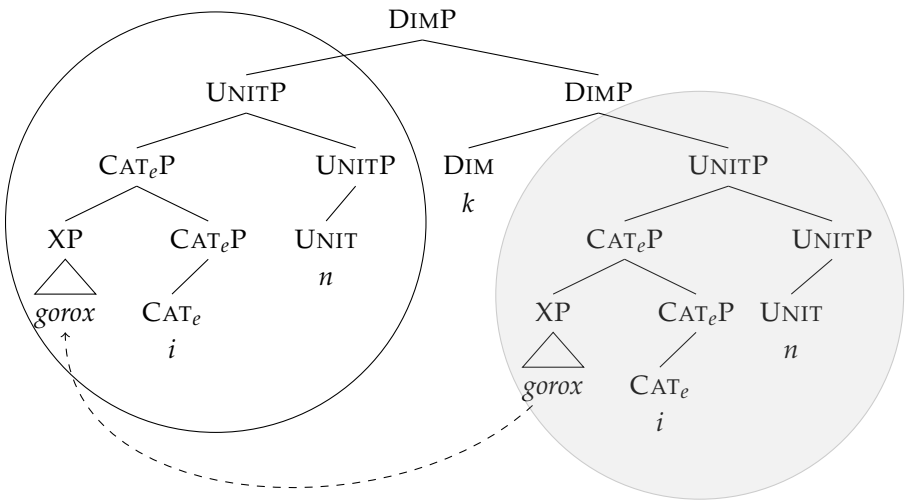
Subsequently, the entire CAT_eP is pied-piped into the Spec of the UNITP. This is illustrated in the tree in (66).

(66)



Finally, after DIM is merged, the XP again pied-pipes the category that dominates it, but this time, the entire UNITP is moved above DIM, as in (67). The result is the reversed order *goroš-i-n-k-*, which is the mirror image of (64). The final step of the derivation would again involve pied-piping, so that one would obtain, e.g., the nominative singular form *goroš-i-n-k-a*.

(67)



Admittedly, the proposed analysis does not explain why singulatives and semelfactives display different morpheme orders in the first place. Though this general issue is intriguing and will ultimately need some explanation, it is beyond the scope of this paper and would need to be explored in the future. However, what is important from the perspective of the current paper is that deriving both orders from the underlying structure in (52) is compatible with current morphological theory and independently established approaches to linearization. Thus, both morpheme orders are expected and the difference does not pose a challenge to the core idea proposed here, namely, that a unified analysis for Slavic singulatives and semelfactives is possible.

6. Conclusions

In this paper, I investigated the empirical analogies between Slavic singulative nouns and semelfactive verbs, focusing on their notional and grammatical similarities. By doing so, I attempted to contribute to the study of the parallelism between the nominal and verbal domain, specifically between the mechanism of individuation of entities and events. I explored corresponding properties of the suffix -IN (*-in*, *-yn*, *-en*) in non-diminutive singulatives (e.g., Geist et al., 2023; Kagan, 2024; Kagan & Nurmio, 2024; Wągiel & Shlikhutka, 2023a) and the suffix -NU (*-nu*, *-nou*, *-nǫ*, *-ni*) in unprefixed semelfactives (e.g., Arsenijević, 2006; Biskup, 2023a, 2023b; Kagan, 2008; Kwapiszewski, 2020, 2022; C. Smith, 1991) such as (68) and (69), respectively.

(68) gorox ∼ goroš-in-a
pea.SG pea-SGV-SG
'peas (as a mass)' ∼ 'a pea' (Russian)

(69) prygat' ∼ pryg-nu-t'
jump.INF.IMPF jump-SMLF-INF.PFV
'to jump (repeatedly)' ∼ 'to jump once' (Russian)

Building on semantic theories grounded in mereotopology, which postulate an ontology that includes clusters, i.e., topologically structured collections of entities (Gréa, 2023; Grimm, 2012; Wągiel, 2021a; Wągiel & Shlikhutka, 2023a), and recent proposals arguing for extending mereotopology to the domain of events (McNally, 2024; Wągiel, 2023a), I proposed that both singulatives and semelfactives encode a unified mechanism of individuation, which designates discrete singular units. In particular, I argued that both -IN and -NU are structurally complex and, in fact, consist of two morphological components: the shared nasal -N and a vocalic segment (cf. Łazorczyk, 2010; Štarkl et al., 2025; Taraldsen Medová &

Wiland, 2019; Wiland, 2019 for Slavic semelfactives). According to the proposal, the suffix -N denotes a general individuating operation that takes a property of clustered entities or events and declusters them, i.e., yields a property of singular discrete units: entities or events, depending on the input type. In comparison, the vocalic components specify what to individuate, i.e., the semantic type of entities vs. events and the spatial vs. temporal connection type of the relevant part–whole structure.

From a broader theoretical perspective, the relevance of the research reported in this paper lies in demonstrating the significance of structured parthood in natural-language semantics (as opposed to unstructured part–whole configurations delivered by purely mereological models). Building on previous mereotopological proposals concerning nominal meaning, the postulate of a unified cross-categorial individuation mechanism that is based on a generalized declustering operation demonstrates the explanatory potential of mereotopological notions. The reported results relate to the well-described analogy between the mass/count distinction and aspect and indicate that the two share not only mereological structure but also topological notions. Thus, in accordance with recent research, the paper further supports a generalized mereotopological approach to linguistic part–whole structures that applies within the domain of both entities and events.

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Abbreviations

The following abbreviations are used in this paper:

3	third person
COLL	collective
DIM	diminutive
FUT	future tense
IMPF	imperfective
IN	generalization over Slavic singulative morphology
INF	infinitive
INFL	inflectional marker
ITR	iterative
M	masculine
NU	generalization over Slavic semelfactive morphology
PFV	perfective
PL	plural
PST	past tense
SMLF	semelfactive

SG	singular
SGV	singulative

Notes

1 Throughout the paper, I use italics to refer to specific object-language shapes and small caps to represent generalized forms that occur across Slavic, irrespective of their exact phonological representation in particular languages. Thus, *-n* refers to the form of the element, e.g., in Russian, whereas -N is an abstraction generalizing over corresponding elements in various Slavic languages.

2 There is, however, a different type of singulative formation with the suffix -IN, which involves the derivation of singular forms of certain human nouns, e.g., Bosnian/Croatian/Montenegrin/Serbian (BCMS) *Srb-i* 'Serbs' ∼ *Srb-in* 'a Serb'. For reasons of space, I will not discuss it in this paper.

3 The other ones are *śrucina* 'a buckshot pellet' (derived from *śrut* 'buckshot pellet(s as a mass)') and *gradzina* 'hailstone' (derived from *grad* 'hail').

4 Actually, Milosavljević (2023) generelizes the claim to all perfective verbs with -N and submits that they all mark singular number in the verbal domain.

5 For instance, in some Slavic languages -NU derives perfective verbs that are not semelfactives, but plausibly denote other types of singular predicates such as delimitative predicates describing short activities and proper perfective achievements. This is the case in Russian (Nordrum, 2020), BCMS (Milosavljević, 2023 and to some extend also Slovenian (Štarkl et al., 2025). Note, however, that all these categories are plausibly singular predicates as well. Furthermore, the semelfactive marker cannot co-occur with the imperfectivizing morphology in North Slavic, whereas in BCMS the two affixes are sometimes compatible (Štarkl et al., 2025).

6 I ignore, here, different kinds of derived nouns with -IN, e.g., spatial collectives and augmentatives, and derived verbs with -NU, e.g., degree achievements and plain activities, briefly discussed in Sections 2.1 and 2.2.

7 Actually, names of vegetables discussed here are typically ambiguous between a mass and a count meaning. However, for the sake of simplicity, here I will ignore this intricacy (for more discussion, see Wągiel & Shlikhutka, 2023b).

8 In this context, an anonymous reviewer points out another *klik*-verb with the meaning 'to call', which is present in many Slavic languages, e.g., Russian *klikat'* ∼ *kliknut'*, BCMS *kliktati* ∼ *kliknuti* and Macedonian *klika* ∼ *klikne*.

9 Notice that, arguably, even *jęczeć* 'to moan (repeatedly)' might be considered onomatopoeic; however, native speakers' intuitions are not entirely clear (as with many other verbs in this class).

10 Again, *buchać* 'to burst (repeatedly)' and other verbs in this class might be viewed as onomatopoeic.

11 An anonymous reviewer points out that in Russian there is a contrast regarding two different types of multiplicatives that seems to support the distinction. According to the reviewer, iteratives more easily combine with *dvaždy* 'twice, on two occasions' rather than *dva raza* 'two times'. In contrast, with semelfactives, *dva raza* sounds better than *dvaždy*. More research is needed to better understand the data, but in general the observation is in line with Wągiel (2023a).

12 The overall empirical picture is more complex that reported here. For details, see Kagan & Nurmio (2024).

13 Again, the empirical landscape is more complex that reported here. For details, see Kuznetsova & Makarova (2012).

14 An anonymous reviewer suggests that the verb *svanuti* 'to dawn' in (21) might be better analyzed as an achievement, rather than a semelfactive. I leave this issue open here since the reviewer agrees that it is certainly a singularity predicate.

15 In Cinque (2015)'s proposal, these are the DIM and END heads, respectively.

16 De Belder (2011) uses the labels SIZE and DIV, respectively.

17 The overall assumption is that ultimately the relationship in question could be captured within a late-insertion model with one lexical entry getting different interpretations in different syntactic environments. However, what such an approach would look like exactly is beyond the scope of this paper.

18 Other examples of such doublets include, e.g., *mladý* 'young' ∼ *mladinký* 'very young' ∼ **mladilinký*, as opposed to *mlaďounký* 'very young' ∼ *mlaďoulinký* 'very, very young', and *drobný* 'tiny' ∼ *drobninký* 'very tiny' **drobnilinký*, as opposed to *drobounký* 'very tiny' ∼ *droboulinký* 'very, very tiny'.

19 In (34), *w* is an individual variable.

20 This is because given other mereotopological axioms, for insofar as everything is connected to its complement, the only spatially integrated entity might well end up being the entire universe (for discussion, see Casati & Varzi, 1999: p. 60).

21 One might object that number on verbs is a purely syntactic phenomenon with no interpretative effect. However, notice that a recent proposal by Krifka & Modarresi (2024) argues that at least some cases of number agreement on verbs should be captured in terms of semantic agreement. Their argument is based on agreement patterns with coordinated subjects, including conjunctions and disjunctions of singular universal quantifiers.

22 This property also seems to explain the uncountability of aggregate nouns since their meaning violates the requirement of non-overlap assumed for countable denotations (see, e.g., Landman, 2011; Wągiel, 2021b).

[23] An anonymous reviewer wonders whether the denotation in (49) should be restricted only to a subset of aggregate nouns. In particular, the reviewer finds it strange to say *There is rice on the table* if they saw only one grain of rice, which contrasts with aggregate nouns denoting items of a larger physical size. Though I accept that there might be interspeaker variation that needs to be explored in future research, my personal judgment is that the reviewer's sentence is definitely felicitous, especially if one adds something like 'one grain's worth'. For instance, consider the following example from the literature: *There is salt on the viewing plate of the microscope, one molecule's worth* (Landman, 2011).

[24] In the interest of space, I will refrain from discussing the meaning of the diminutive component, but I believe that it is rather straightforward how it would fit in the overall picture (though see Kagan & Nurmio, 2024 for less obvious cases). Notice also that instead of DIM, one could assume something like the SIZE head (De Belder, 2011; De Belder et al., 2014) or, alternatively, the EVAL head to potentially account also for hypocoristics (Fornasiero, 2023). Since this is not the crucial aspect of the paper, I leave this issue open for future research.

[25] Notice that Štarkl et al. (2025) propose that -N and the vocalic segment make a constituent to the exclusion of the root and the DIM head, which are assumed to be sisters. In contrast, I propose a cascading structure.

[26] An anonymous reviewer points out that in East Slavic, -IN can attach also to pluralia tantum to derive singulatives, e.g., Russian *lyži* 'skis' ∼ *lyžina* 'a ski', and wonders whether the proposed analysis can account for such cases. This distribution has been already discussed in the literature on Slavic singulativs (Geist et al., 2023; Kagan, 2024; Wągiel & Shlikhutka, 2023b). Notice that it has been suggested that at least certain types of pluralia tantum can be captured in terms of inherently cluster-denoting predicates (Grimm & Dočekal, 2021). Thus, it seems that the analysis can be straightforwardly extended to the cases in question.

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