

DERIVING COLLECTIVES IN THE HISTORY OF SLAVIC

JOSEPH RHYNE
DEPARTMENT OF LINGUISTICS
CORNELL UNIVERSITY

6/13/20
VIRTUAL ECIEC XXXIX

1 Introduction

- For the most part, we see morphology, syntax, and semantics working together to express the lexical and grammatical meanings of words and language as a whole
- However, there are cases where these are at odds with one other.
- “Collectives,” seen commonly throughout Indo-European, often have a mismatch between these categories, e.g.
 - Singular morphology but plural meaning
 - Unexpected morphological and syntactic agreement patterns
- The Slavic branch, like other daughter languages has many instances of collectives, but little work has been done to place these in a wider Indo-European and cross-linguistic context.
- The big question here: How do such formations arise?
- This paper begins to address this gap: We show that Slavic collectives are derived in the same manner that Nussbaum (2014) describes for Proto-Indo-European:
 - PIE collectives are derived from substantivizations of possessives and genitivals

Outline and Goals:

1. Define true collectives (*not* pseudo-collectives like pluralia tantum)
2. Review collective formations in the history of Slavic and their properties
3. Show that these collectives are derived from substantivizations of possessives and genitivals, following Nussbaum (2014)

2 Defining Collectives

- We first need to know what we are looking for.
- Collectives are not the only type of nominal formations that have a discontinuity between semantics and the syntax or morphology, e.g. pluralia tantum. These must be excluded in a systematic way.
- Thankfully, this work has already been done for us:
 - We start by dividing nouns into different categories based on their semantic or syntactic features of nominal aspect.
 - We follow Jackendoff (1992)’s Conceptual Semantics Framework, where types of nouns are derived by two binary features:
 - * **[±bounded]** or **[±b]**: finite vs. infinite extension. Bounded nouns have clearly defined limits on their extent, whereas unbounded nouns have no such clear delimitations.
 - Linked to the properties of “distributed reference” and “internal homogeneity,” where an unbounded referent can be divided into smaller parts while still qualifying as that referent, while bounded ones cannot.
 - The unbounded noun *sand* can be divided apart and still be *sand*, whereas a bounded noun like *man* cannot.
 - * **[±internal structure]** or **[±i]**: Nouns that are internally structured are composed of individual units that can be considered identical to each other.
 - * These two features combine to give the four categories of nouns in Table 1
 - Among these, there are two types of collectives:
 1. Bounded [+b,+i] collectives: *herd*, *citizenry*
 2. Unbounded [-b,+i] collectives: *cutlery*, *humanity*
 - * Note that these are linked to two interpretations dependent on context:
 - (a) Generic: *cutlery* (generic), i.e. “all the cutlery in the world,” which is countable but unbounded

(b) Specific: *cutlery* (specific), e.g. “the cutlery on the table,” which is both countable and bounded

* Additionally, they are made only from count/countable nouns, i.e. those that have feature [+i]

– Further, we define true collectives as those that are syntactically or morphologically singulars while semantically referring to a multiplicity (Nussbaum, 2014)

* This definitionally rules out other nominals that have form-meaning mismatches like pluralia tantum or singulatives.

– Moreover, we distinguish between derived collectives, i.e. those that are made synchronically from non-collectives, and underived collectives. Table 2 shows examples of derived and underived English collectives.

– With the binary features, we can characterize the derivations that give true collectives in English and IE (Nussbaum, 2014):

1. count noun [+b,-i] → bounded collective [+b,+i]
* *constable* → *constabulary*
2. count noun [+b,-i] → unbounded collective (mass) [-b,+i]
* *a fruit* → *fruit* (generic)
3. mass noun (collective) [-b,+i] → bounded collective [+b,+i]
* *fruit* (generic) → *fruit* (specific)

• The term “delibatives” has been used to denote derivations of mass nouns which designate a sample of that mass, with the features [+b,-i]

• Nussbaum (2014) maps out a three-way contrast among delibative and collective derivatives and their semantic interpretations:

1. purely collective class
– *constable* → *constabulary*
2. purely delibative class
– *grain* → *grainage* ‘crop of grain’
3. collective/delibative class
– *citizen* → *citizenry* ‘a collection of citizens’/‘a sample of all citizens in the world’

	[-internal structure]	[+internal structure]
[+bounded]	[+b,-i]: individuals, e.g. <i>man</i>	[+b,+i]: groups, e.g. <i>family</i>
[-bounded]	[-b,-i]: substances, e.g. <i>sand</i>	[-b,+i]: aggregates, e.g. <i>wildlife</i> (generic)

Table 1: 4 categories of nouns according to aspectual features [\pm bounded] and [\pm internal structure]

	Derived	Underived
Bounded	citizenry, baggage	group, set, herd
Unbounded	shrubbery, humanity	poultry

Table 2: Examples of the different types of collectives in English

- Collectives and delibatives are closely intertwined (if not inseparable) in the semantics and morphology of Indo-European
- However, for our current purposes, we leave aside delibatives and delibative interpretations
- We focus on derived collectives in Slavic that can be described by the feature sets [+b,+i] (e.g. family) and [-b,+i] (e.g. wildlife) and how they fit within the wider Indo-European context of derived collectives

3 Collectives in Slavic

- We now know what to look for within the different stages of Slavic.
- Before we analyze *how* these true collectives are derived, we begin with a non-exhaustive review of various formations at every stage of Slavic and the properties they exhibit

3.1 Morphological Formations

- The main group of collective formations here are divided according to their Proto-Slavic formants.
- These formants and examples of their use throughout the stages of Slavic can be found in Vaillant (1974) and Matasović (2014).

1. PSI. *-īje and *-īja stems.

In the oldest attested stages of Slavic, these are probably the most common collective formation, derived from the PIE genitival formant **-i̯ō-* (cf. Matasović (2005)). Their bases are nominal and adjectival stems, and they usually describe a collection of plants or a material. Here we give a partial list of derivatives and synchronic bases found in Old Church Slavonic, with many being reconstructable for Proto-Slavic:

- * *agnēdije* ‘black poplar grove’ from *ag-* ‘tree’
neđū ‘black poplar’
- * *drēvije* ‘tree grove’ from *drēvo* ‘tree’
- * *borije* ‘pine grove’ from *borū* ‘pine’
- * *d(ī)račije* ‘thorns’ from *d(ī)račī* ‘thorn’

- * *jelije* ‘fir tree grove’ from *jela* ‘fir tree’
- * *korenije* ‘roots’ from *korenj* ‘root’
- * *lozije* ‘vines’ from *loza* ‘vine, branch’
- * *perije* ‘feathers, plumage’ from *pero* ‘feather’
- * *brat(r)ija* ‘brothers, brethren’ from *brat(r)j*
- * *korenija* ‘roots’ from *korenj* ‘root’ (cf. -ije collective *korenije*)
- * *protije* ‘bundle of sticks’ from *protj* ‘stick’
- * *rabije* ‘servants’ from *rabj* ‘servant’
- * *stoborije* ‘colonnade’ from *stoborj* ‘column’
- * *rabija* ‘slaves, servants’ from *rabj* ‘servant’
- * *šemija* ‘household, family’ from *šemj* ‘household member’

2. **PSI *a-stems.**

There are a number of masculine a-stem nouns that have collective force.

- * *gospoda* ‘lords’ from *gospodj* ‘lord’
- * Ethnonyms, such as OES *Mordva* ‘the Mordvins’, *Litva* ‘the Lithuanians’

3. **Collective numerals in *-er-.**

Throughout Slavic, there are collective numerals that express the specific number of a group, similar to *pair* in English. They are used with collectives and *pluralia tantum* nominals. Morphologically, they are simple thematic neuter nominal stems. Table 3 (Majer, 2017) shows them at the Proto-Slavic stage. The formant in *-er- does not seem to be a PIE category for collectives. More on how these are derived below. The numerals 2-4 also have collective forms, but 2-3 are derived using a morpheme that is very similar to -ije collectives, while the collective numeral for 4 is underived.

- * *dvoje* ‘group of two’
- * *troje* ‘group of three’
- * *četvero* ‘group of four’

Collective numeral	Corresponding Cardinal
* <i>petero</i> ‘group of 5’	* <i>petj</i> ‘5’
* <i>šestero</i> ‘group of 6’	* <i>šestj</i> ‘6’
* <i>sedmero</i> ‘group of 7’	* <i>sedmj</i> ‘7’
* <i>osmero</i> ‘group of 8’	* <i>osmj</i> ‘8’
* <i>devetero</i> ‘group of 9’	* <i>devetj</i> ‘9’
* <i>desetero</i> ‘group of 10’	* <i>desetj</i> ‘10’

Table 3: Proto-Slavic Collective numerals 5-10

4. **PSI *-ina stems.**

This suffix derives a number of collectives and augmentatives:

- * OCS *brěžina* ‘birch grove’ from *bręza*
- * OCS *sędina* ‘grey hair’ from *sędj* ‘grey’
- * OCS *družina* ‘company’ from *drugj* ‘friend’
- * Croat. *množina* ‘multitude’ from *mnogj* ‘many’

5. **PSI *-jěn- stems.**

This formant was used to build ethnic names and a few other collectives:

- * OCS *slav-jane* ‘the Slavs’
- * OES *pol-jane* ‘the Polyans’
- * OCS *gražd-ane* ‘citizens’ from *gradj*
- * OES *drěvl-jane* ‘the Drevlyans’

6. **PSI *-j stems.**

Some substantivized abstracts in -j can sometimes take on a collective value. These are more archaic and sometimes (as with the case of ‘household’) the synchronic derivational relationship might not be clear:

- * OCS *čędř* ‘people’ from *čędo* ‘child’
- * OCS *skędřlj* ‘tiles, pottery’ from *skędřlj* ‘tile, pottery’
- * OES *poganj* ‘the pagans’ vs. adjectival/substantive *poganj* and singulative *poganinj* ‘a pagan’
- * OCS names of peoples can have collectives in -j, e.g. *Rusj* ‘the Rus, the Russians’, *Čędř* ‘the Tchouudes’
- * OCS *čęljadř* ‘household, servants, children’
- * PSI. **moldežj* ‘youths’ (Russ. *molodęž*, Croat. *mládž*) from **moldj* ‘young’

7. **Modern Slavic.**

Many of these Proto-Slavic formations have been retained by the modern Slavic languages, to varying degrees of productivity. These languages have also innovated new productive formations and extensions of old formations for collectives, which include -ija, -ež, -stvo, -ak-, and -ina. For example, Polish and Russian have a suffix -nja that forms nouns denoting an aggregate or groups of people:

- * Russ. *ovčarnja*, Polish *owczarnia* ‘a sheepfold’ from *ovčar* and *owczarz* ‘shepherd’, respectively
- * Russ. *konjušnja* ‘a stable’ from *konjux* ‘stableman’
- * Russ. *sotnja* ‘a hundred, a military unit of one hundred’ from *sotyj* ‘hundredth’
- * Russ. *dvornja* ‘servants’ from *dvor* ‘homestead, yard’
- * Russ. *rebjatnja* ‘children, kids’ from *rebjata* ‘child’

Elsewhere, we can see the limited formation of collectives using -ota in Russian:

- * *pexota* ‘foot soldiers, infantry’

	Derived
Bounded	OCS <i>brat(r)ŭja</i> ‘brothers, brethren’, <i>borije</i> ‘pine grove’
Unbounded	OCS <i>perije</i> ‘plumage’, <i>čędŭ</i> ‘people’

Table 4: Examples of the different types of derived collectives in Slavic

★ *bednota* ‘poor people’

These and other modern collective formants play a key role in our analysis of Slavic collectives below.

3.2 Semantic & Syntactic Properties

- We can verify that these formations match our definition of true collectives above by examining their semantic and syntactic properties.
 - True collectives display either morphologically or syntactically singular patterns or forms but represent semantically some multiplicity.
- Within these formations, we can see both bounded and unbounded collectives (Table 4). Thus, the binary feature set we have adopted easily describes these collectives.
- Beyond this, we can characterize the derivations of the collectives using 3 broad derivations from Section 2:
 - count noun [+b,-i] → bounded collective [+b,+i]:
 - * OCS *brat(r)ŭ* ‘brother’ → *brat(r)ŭja* ‘brothers’
 - count noun [+b,-i] → unbounded collective (mass) [-b,+i]:
 - * OCS *pero* ‘feather’ → *perije* ‘plumage’ (generic)
 - mass noun (collective) [-b,+i] → bounded collective [+b,+i]:
 - * This is more dependent on context and could be forced by definite readings, e.g. ‘plumage’ (generic) → ‘plumage’ (specific)
- The mismatch between their singular morphology and plural semantic readings is clear, but this is further emphasized in the syntactic agreement.
- There are two different agreement patterns for OCS collectives (Huntley, 1989):
 - **Attributive agreement:** agreement is based on the morphology, i.e. singular
 - **Predicate agreement:** agreement is based on the semantic interpretation, i.e. plural
- These two patterns are shown here with collectives in bold, attributives italicized, and predicates underlined:

(1) i sŭpovędasta **sřidobolji**(SG) *svojei*(FEM.SG) jaže vidęsta vŭ nošti oni(MASC.PL)

veselo přiiimše(MASC.PL) slovo načășę(PL) iskati

‘And the two of them told their relatives what they had seen at night. So they, having joyfully received the news, began searching.’ (*Codex Suprasliensis*)

(2) ne vŭzimajotŭ(PL) *pioniina*(FEM.SG) **čędŭ**(SG)

‘Pionius’ adherents are not accepting.’ (*Codex Suprasliensis*)

- The two collectives are *sřidobolji* ‘relatives’ and *čędŭ* ‘adherents,’ respectively. Both show feminine singular agreement on attributive modifiers and masculine and/or plural agreement on predicates and verbs.
- These agreement patterns have more complicated details, but they all illustrate the conflicts between morphology, semantics, and syntax that speakers had to reconcile.
- They also show that these collective formations fit our definitions of true collectives

4 Collectives as Substantivizations of Possessives/Genitivals

- We now have a good idea of what collectives in Slavic were and how they were formed.
- We now can analyze these within a wider Indo-European context by extending previous analyses of PIE collectives as substantivizations of possessives and genitivals (Nussbaum, 2014).

4.1 Deriving Collectives in PIE

- Nussbaum (2014) maps out the relationship between the PIE feminine, neuter plural, abstract nominal, and collective forms, connected by their morpheme in *-h₂-. Nussbaum (2014) also shows the derivational relationships between these.
- Throughout Indo-European, collectives are derived from genitivals (e.g. Ved. *pārśu-* ‘rib’ → *pārśvám* (-a- neut. w/ vřddhi) ‘side,’ Lat. *porrum* ‘leek’ → *porřina* ‘leek field’) or possessives (e.g. Lat. *arbōs* ‘tree’ → *arbustum* ‘copse,’ Ved. gó- ‘cow’ → gómat ‘wealth in cattle’), with ablaut shifts matching the internally derived possessive derivatives (e.g. collective *h₁néh₃-mŭ → *h₁néh₃-mō(n) ‘pair of names, full name’ matches the pattern of possessives like *přh_x-uř/*přh_x-uřen- ‘fat’ (subst.) → *přh_x-uřō(n) ‘fat’ (adj.))
- This implies two things:
 1. PIE collectives involved internal derivation of possessives

2. PIE collectives were semantically similar to the collectives from possessives and genitivals seen in the daughter languages

- Moreover, the outcomes for the genitivals and possessives are not really distinct anywhere as a result of their semantics
 - Possessives have a source meaning along the lines of ‘having X’
 - Genitivals come from the other direction with a meaning of ‘made up of X’
 - Thus ‘containing Xs’ and ‘made up of Xs’ both extend naturally to the collective meaning
 - Consequently the two pathways (possessive vs. genitival) do not make a difference in the end result
 - This extends beyond PIE to the daughter languages
- Thus in Figure 1, we can see that the basic PIE collectives had a two-step derivational history:

1. Derivation of the possessive through the thematic vowel
2. Addition of *-h₂- to the thematic stem to form a collective

Non-collective → Possessive (*-o/e-, no *vṛddhi*) → Possessive plus *-h₂ = collective/deliberative

*h₂user- (ἀήρ ‘air’) *h₂usr-o/e- *h₂usre-h₂ (αῦρα ‘a breeze’)

*ph₂ur- (πῦρ ‘fire’) *ph₂ur-o/e- (*πῦρόν ‘watch-fire’ §8.2.3.2) *ph₂ure-h₂ (πῦροῖ ‘burning mass’)

Figure 1: Possessive-plus-*h₂ substantivizations and their two-step derivation

- On the basis of these, we can ascribe the same pattern to collectives built off of internally derived possessives as in Figures 2 and 3, which show collectives of the *h₁néh₃-mō(n) and *uéd-ōr types being derived.

Non-collective → Possessive → Possessive plus *-h₂ = collective/deliberative

*h₃éng^u-ŋ ‘Schmierfett’

cf. *pīh_x-uŋ/-n- ‘fat’ *pīh_x-uon- ‘fat(ity)’

*h₁néh₃-mŋ ‘name’

cf. *séh₁-mŋ ‘seed’ *seh₁-mon- ‘Sēmō’

Figure 2: -(C)EC-h₂ substantivizations and their analogous derivational process

Non-collective → Possessive → Possessive plus *-h₂ = collective/deliberative

*péh₂-uŋ/-uén- ‘fire’

*uód-ŋ/-n- ‘water’

*sók-ŋ/-n- ‘excrement’

*h₁ésh₂-ŋ/-n- ‘blood’

*péh₂uor-h₂ ‘a burning mass, a fire’

*uédor-h₂ ‘a body, stretch, of water’

*sékor-h₂ ‘a quantity, mass of excrement’

*h₁ésh₂or-h₂ ‘a mass, gout of blood’

Figure 3: Internally derived possessive leading to the *uéd-ōr type collective

- Based on these we can summarize one of the derivational processes for creating PIE collectives as:

Non-Collective → Possessive (Internally or externally derived) → Collective (through substantivizations externally derived, e.g. by *-h₂)

- The semantics that drive this shift are fairly clear, as the possessives and genitivals already have a partially exocentric relationship to their base word.
- Nussbaum (2014) shows how this applies for PIE and many daughter languages (e.g. Latin, Greek, Vedic).

4.2 Deriving Collectives in Slavic

- Despite having this framework, Slavic collectives, beyond the identification of morphological formants, have not been adequately analyzed.
- We can now extend this possessive/genitival derivational framework to Slavic.

- We can start by looking at the collective numerals from Table 3 in Section 3.1. These are derived from the de-numeral adjectives in Table 5, which have a general meaning of ‘X-fold’ (Majer, 2017). Both groups can be extended to higher numerals, e.g. *sūtoricejō* from *sūtorica ← *sūto ‘100.’ Majer (2017)’s derivation of the collectives from neuter substantivizations of the de-numeral adjectives is similar to deriving collectives from genitival and possessive substantivizations:

*pętero ‘a 5-fold (entity) > ‘a group of 5’ from the inflected adjective *pęterŭ, -a, -o ‘5-fold’

Collective numeral		Corresponding Cardinal	
*peterŭ	‘5-fold’	*petī	‘5’
*šesterŭ	‘6-fold’	*šestī	‘6’
*sedmerŭ	‘7-fold’	*sedmī	‘7’
*osmerŭ	‘8-fold’	*osmī	‘8’
*devęterŭ	‘9-fold’	*devęti	‘9’
*desęterŭ	‘10-fold’	*desęti	‘10’

Table 5: Proto-Slavic de-numeral adjectives 5-10

- Moreover, we see this transition from substantivizations of possessives and genitivals to collectives all throughout the history of Slavic.
- Many of the suffixes listed above derive genitivals and substantivizations in Slavic and across Indo-European, for example
 - **PSI. -i-stems.** Throughout Indo-European, we see PIE *-i-stems derive genitivals, e.g. Lat. *sacrum/sacra* ‘rite(s)’ → *sācri* ‘of the rites, for sacrificing’, YAv. *zaraθuštra-* → *zaraθuštri-* ‘of, descended from *Zaraθuštra*.’
 - **PSI. *-ina stems.** In Slavic, we can see *-ina deriving genitivals beside the collectives above (among other things), e.g. PSI. **ērę* ‘lamb’ (Croat. *järe*) → **ērina* ‘wool’ (Croat. *järina*), PSI. **paqkŭ* ‘spider’ (Croat. *päük*) → **paqčina* ‘spider’s web’ (Croat. *päučina*)
- The collective readings are then natural extensions of these morphemes’ other functions and semantics.
- Thus, in the shift from PIE to Slavic, the collectives were derived from these formants, as natural extensions of the possessive/genitival semantics, much as they and similar formants were in other IE branches.
- Beyond this, we can even see this specific kind of shift within the attested history of Slavic.
- The suffix *-ištvo* derived substantives in OCS:

* <i>balīštvo</i> ‘medicine’	* <i>cęsaīštvo</i> ‘kingdom’
* <i>božīštvo</i> ‘divinity’	
* <i>brat(r)īštvo</i> ‘brotherhood’	* <i>človęčīštvo</i> ‘humanity’
- Over time, this suffix has shifted from the abstract [-b, -i] to a collective [+b, +i] meaning in the modern languages, e.g.
 - Czech *lidstvo* ‘human race,’ *ponstvo* ‘the nobility,’ *plactvo* ‘the birds’
 - Slovene *ljudstvo* ‘men,’ *ženstvo* ‘women,’ *človęštvo* ‘the human race’

- Polish *bractwo* ‘brethren’
- *-ota* is another example of this shift in modern Slavic. In the oldest stages, it derived abstract nouns like OCS *čistota* ‘cleanliness, purity’ ← *čistŭ* ‘clean, pure.’ This function is still available in the modern languages, e.g. Croat. *čistóta* ← *čist*, but in Russian it is also a limited-use collective marker, e.g. *bednota* ‘poor people.’
 - This might be an ongoing shift in Russian, but more work needs to be done to investigate this.
- These shifts can be explained in the same manner as the PIE derivation of collectives:
 1. Start with substantives or abstracts, e.g. OCS *človęčīštvo* ‘humanity’ or ‘the quality of being human’
 2. Semantic extension to possessive or genitival meaning, e.g. ‘having humanity’ or ‘made up of humanity’
 3. Substantivized as collective, e.g. Russ. *človęštvo* ‘the human race’, i.e. ‘the group of individuals having humanity or made up of humanity’
- Thus, in Figure 4, we can map the derivational scheme for Slavic in much the same way as PIE and the previously investigated daughter languages. The intermediate stage of possessive or substantive might not be attested morphologically, but the semantic shift still gives evidence for it.
 - Going from ‘X’ to ‘group of X’ still would require this transition. Thus, the collective of ‘pine tree’ would literally be ‘grove of pine trees,’ indicating the possessive/substantivized nature of the shift.
 - Thus we hypothesize unattested or non-overtly derived intermediate genitival/possessive forms continuing the original meanings of formants like PIE *-iō-.
 - * By “non-overtly derived” we mean that there is not another morpheme or morphological shift that derives the possessive/genitival or substantivized stages
 - * Because there is no additional morphology in the modern Slavic examples, this would be a semantic shift
- This is further emphasized by the fact that this shift occurs with morphemes that have multiple uses, just as with the PIE *-h₂ morpheme that shows up in collective, feminine, neuter plural, abstract nominals.
 - Thus, we might say that the “collective” morphemes really just encode substantivizations of the possessive/genitival semantics, just as with the PIE possessive/genitivals plus *-h₂.

Non-collective	→ Poss./Substant. →	Collective
OCS <i>pero</i> ‘feather’		<i>perije</i> ‘feathers’
OCS <i>prǫtŭ</i> ‘stick’		<i>prǫtije</i> ‘bundle of sticks’
OCS <i>borŭ</i> ‘pine tree’		<i>borije</i> ‘pine grove (i.e. grove of pine trees)’
OCS <i>pěŭ</i> ‘5’	<i>pěterŭ</i> ‘5-fold’	<i>pětero</i> ‘group of 5’

Figure 4: Derivation of collectives in Slavic

- It is important to qualify this analysis:
 - This is simply a primary and viable pathway of derivation for collectives in Slavic, Indo-European, and perhaps cross-linguistically.
 - Not all substantivizations of genitivals and possessives become collectives, and this is not the only way to have collectives synchronically:
 - * the a-stem ethnonyms, like *Mordva* ‘the Mordvins’ are probably not morphologically derived at the synchronic level, but are more likely semantic extensions of the normal a-stem place names.
- Nevertheless, this pattern of deriving collectives from substantivizations holds remarkably well. And even in these “exceptions,” the exocentric semantics are quite apparent in terms of the place names.
- All of this shows that the same general methods of deriving collectives in PIE were used in Slavic. We can see those processes both synchronically and diachronically in Slavic.
- This is merely a step towards having a complete survey of collectives in Indo-European and cross-linguistically.

References

- Huntley, D. (1989). Grammatical and lexical features in number and gender agreement in old bulgarian. *Paleobulgarica*, 4:21–32.
- Jackendoff, R. (1992). Parts and boundaries. In *Lexical and Conceptual Semantics*, pages 9–46. Blackwell, Oxford.
- Majer, M. (2017). The ‘fiver’: Germanic ‘finger’, balto-slavic de-numeral adjectives in *-ero- and their indo-european background. *Transactions of the Philological Society*, 115:239–262.
- Matasović, R. (2005). Collectives in -ŕje in slavic. *Suvremena lingvistika*, 59-60:35–38.
- Matasović, R. (2014). *Slavic Nominal Word-Formation. Proto-Indo-European Origins and Historical Development*. Universitätsverlag Winter, Heidelberg.

- Nussbaum, A. J. (2014). Feminine, abstract, collective, neuter plural: Some remarks on each (expanded handout). In *Studies on the Collective and Feminine in Indo-European from a Diachronic and Typological Perspective*, page 273–306. Brill, Leiden.
- Vaillant, A. (1974). *Grammaire Comparée des Langues Slaves Tome IV: La Formation des Noms*. Éditions Klincksieck, Paris.