10.20378/irb-96034

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Morphological variation in Slavic verbal suffixes

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International workshop "The Slavic verb – a multi-faceted approach», Bamberg, May 24, 2024

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1. Introduction
Variation as Competition and Overabundance

- Linguistic variation is usually represented in terms of competition or overabundance.
- In the case of **competition** between functionally similar units:
  - **Leveling**: One form ousts its rival over time (Old Norse *ljúfr* and *kærr* ‘dear’; Bjorvand 2000, Blevins & Blevins 2009)
  - **Sociolinguistic differentiation**: The two rivals survive in different varieties of a language (*kid* and *child* in English, Harper 2001–2017)
  - **Semantic differentiation**: The rival forms develop different meanings over time (*brethren* and *brothers* in English; Croft 2000, Nesset and Makarova 2018)
- **Overabundance**, on the other hand, suggests that doublets, functionally and semantically equivalent units, are possible (Thornton 2012).
- Within morphological variation:
  - semantic and functional splits are mostly observed in the case of lexical morphemes (Lindsay & Aronoff 2013),
  - whereas overabundance is primarily attributed to variation in inflectional forms (Lečić 2016).

1. Introduction
Morphological variation in Slavic

- Morphological variation in Slavic languages has gained attention in a number of recent cognitive linguistic studies:
  - see Bermel & Knittl 2012, Lečić 2016 on allomorphy in nominal endings;
  - Janda et al. 2013, Endresen 2015, Olsson 2018, 2021 on allomorphy and synonymy in verbal prefixes;
  - Nesset & Janda 2010, Makarova & Janda 2009, Kuznetsova & Makarova 2012, Nordrum 2020 on variation in Russian verbal suffixes (*–a-/-aj-*, *–nu-/-anu-*)
- However, for the verbal domain, the main focus of such research is usually placed on prefixes rather than suffixes.
  - The presence of borrowed verbal stems in Slavic languages gives rise to morphological variation among verbal suffixes.
- Suffix variation in loan verbs has not received considerable attention in literature. Some relevant cases, such as the use of Russian suffixes *-ova-/-irova-*, are analyzed within research on biaspectual verbs (Horiguchi 2018).

Research questions:

- Which suffixes serve as loan verb markers in which Slavic languages and what determines the suffix choice?
- Do we attest variation patterns with the same stems and do they present a case of morphological competition or overabundance?

Case study 1
The choice of suffix in Russian loan verbs

together with

Aleksandra Ignateva (University of Bergen) & Elizaveta Kibisova (University of Oslo)

Russian Data

In modern Russian verbs can be formed by a handful of suffixes:
-ova-, -eva-, -irova-, -stvova-, -nu-, -anu-, -i-, -niča-, -a-, -e-, -yva/iva-, -va-

- The suffixes *-eva-*, *-stvova-*, *-irova-* are often treated as allomorphs of *-ova-*, whereas *-anu-* is considered as an allomorph of *-nu-* (Townsend 1968; Švedova et al. 1980; Lopatin & Uluxanov 2016)
- database of all verbs featuring these suffixes that have an ipm > 4 in Lyashevskaya & Sharov (2009; http://dict.ruslang.ru/freq.php, based on the frequencies from the Russian National Corpus (RNC), which comprises **6,241 verbs**,
- We adopt a usage-based perspective (Kemmer & Barlow 1999) and, based on corpus data, approach these suffixes and the stems they combine with as derivational clusters.

Research questions (RQ):

-ova-, -eva-, -irova-, -stvova-, -nu-, -anu-, -i-, -niča-

How are these suffixes distributed among loan and original Slavic verbs? More specifically, what triggers the choice of the suffix?

1. motivating base (e.g. -*i*- with nominal motivating bases: *frendit'* < *friend*)
2. source language (e.g. -*irova*- from German -*ieren*: Rus. *basirovat'* < Ger. *basieren* 'base')
3. morphophonology (e.g. only -*irova*- with stems ending in a vowel: *intervjuirovat'* < *interview*)

RQ1. The distribution of suffixes across loan and Slavic verbs

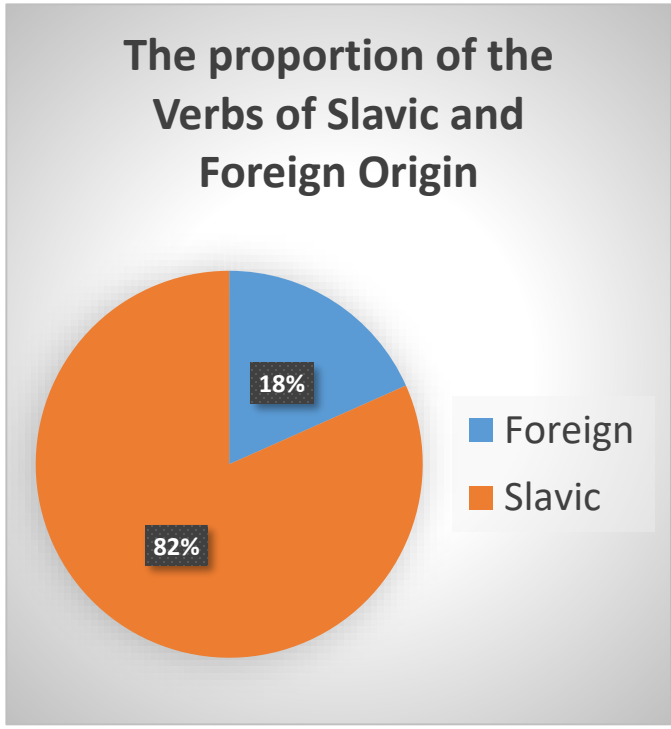


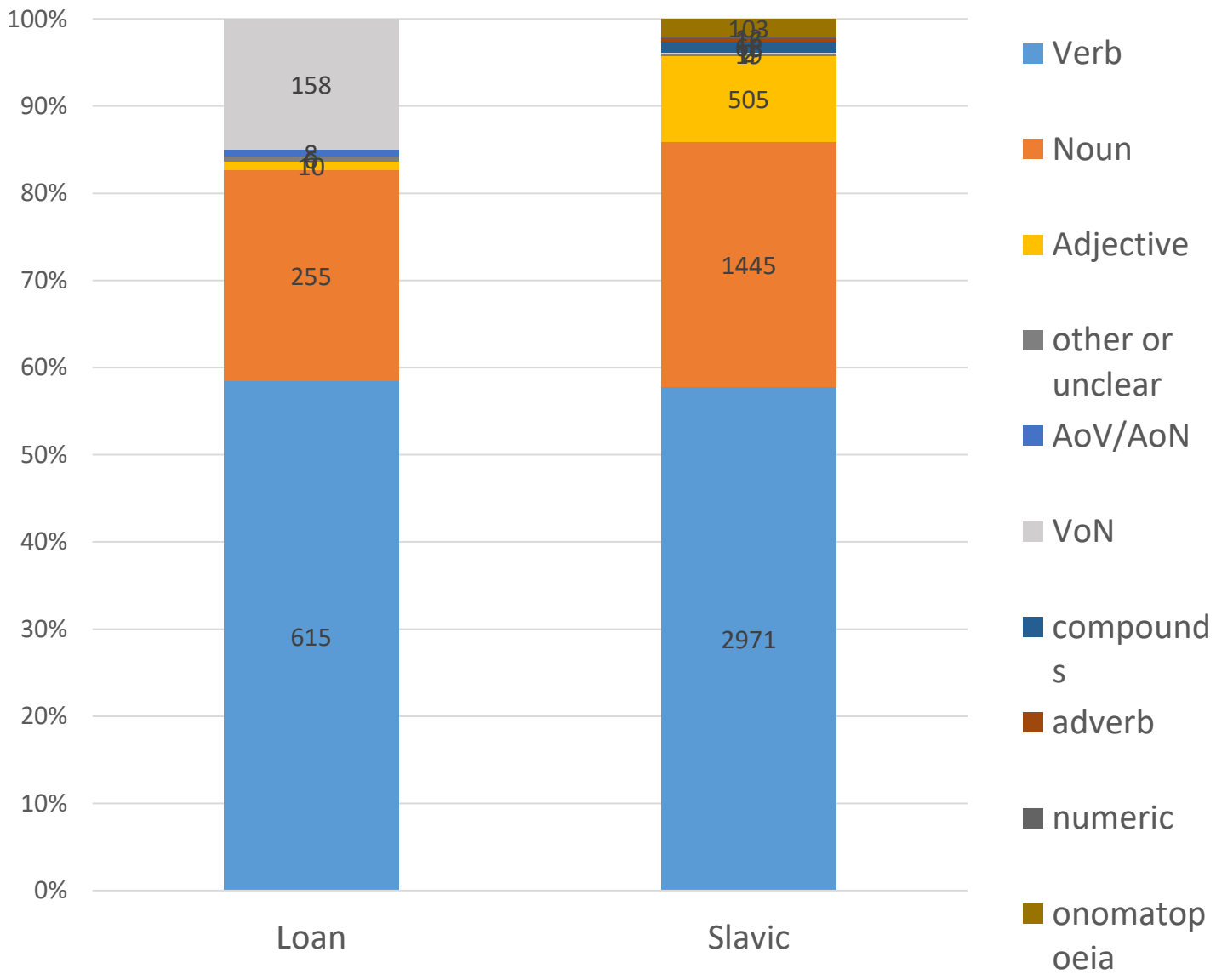
Figure 1. The distribution of the suffixes across loan and Slavic verbs in our database.

RQ1. How are loan verbs with these suffixes integrated into the system of Russian verbal word-formation?

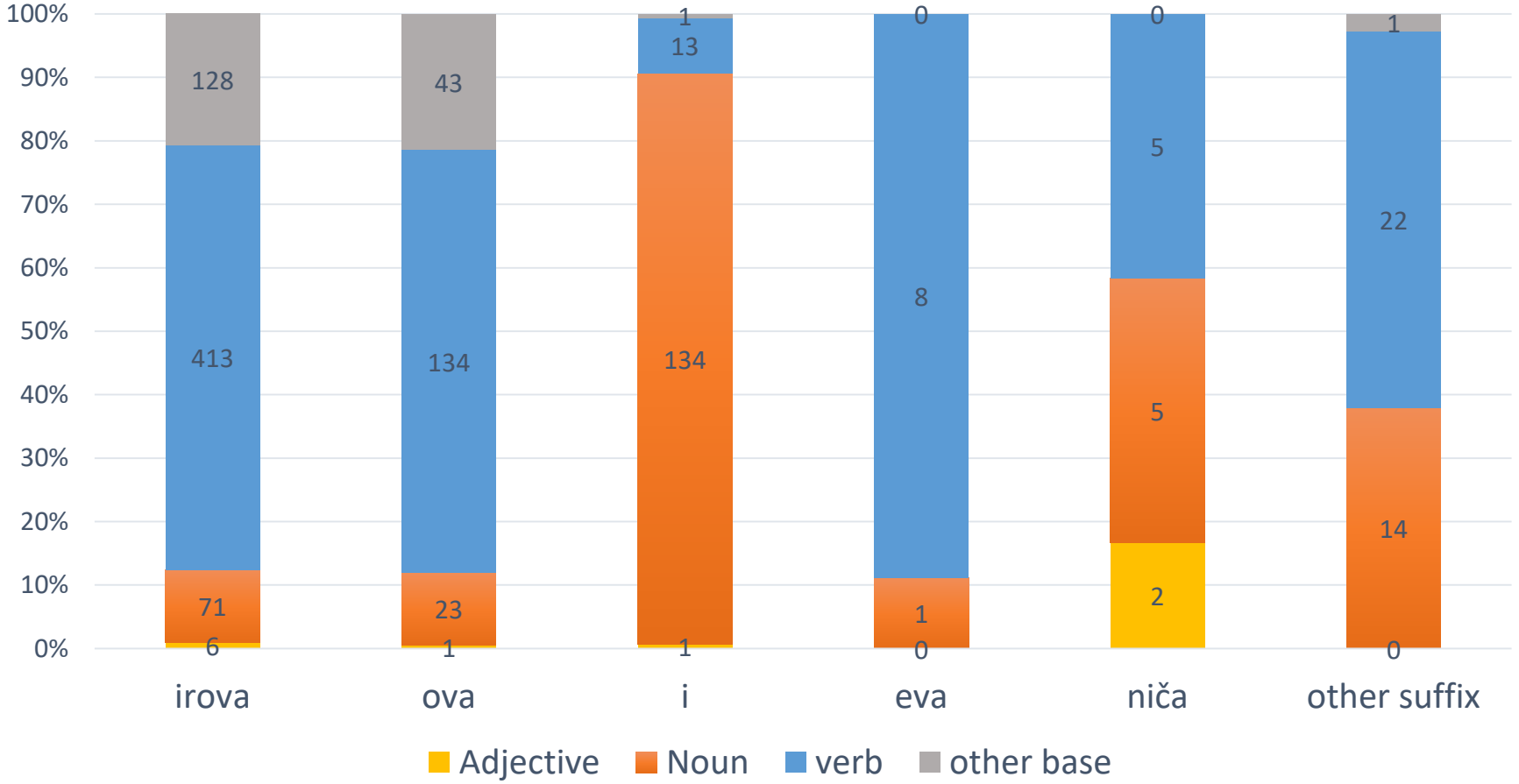
- The most productive suffixes for loan verbs are *-irova-, -ova-*, *-i-* (not just *-irova-* as in Švedova 1980)
  - *-irova-*: is a purely loan verb marker. Rare exceptions: *bron-irova-t'* 'book.IPF', *za-bron-irova-t'* 'book.PF'; *s-klad-irova-t'* 'put into storage; stock.IPF'
  - *-ova-*: is widely used with both loan and Slavic stems, shows a more even distribution of different patterns
  - *-stvova-*: is used only with Slavic stems; the base normally represents a noun or an adjective: *bed-stvova-t'* 'live in poverty.IPF' < *bed-a* 'misfortune.N'

Motivating base

- Part of speech of the original word that serves as the base for the formation of the loan verb
- Most bases are verbs and nouns (verbs being more frequent):
  - Cf. borrowing hierarchy (Haugen 1950):
  - nouns > verbs > adjectives > adverbs & prepositions
- The distribution between nominal and verbal bases is very similar in loan and Slavic verbs



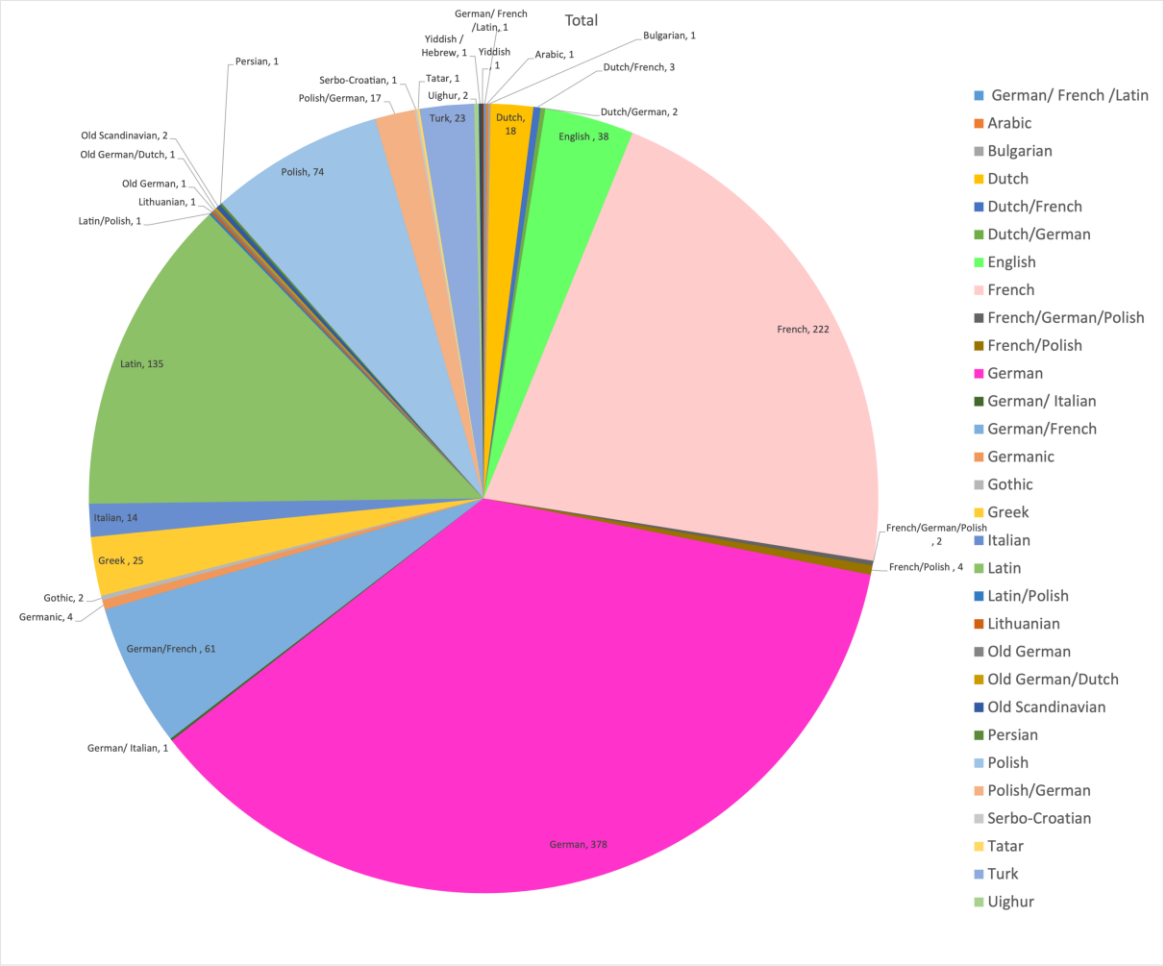
The distribution of suffixes across the bases of loan verbs

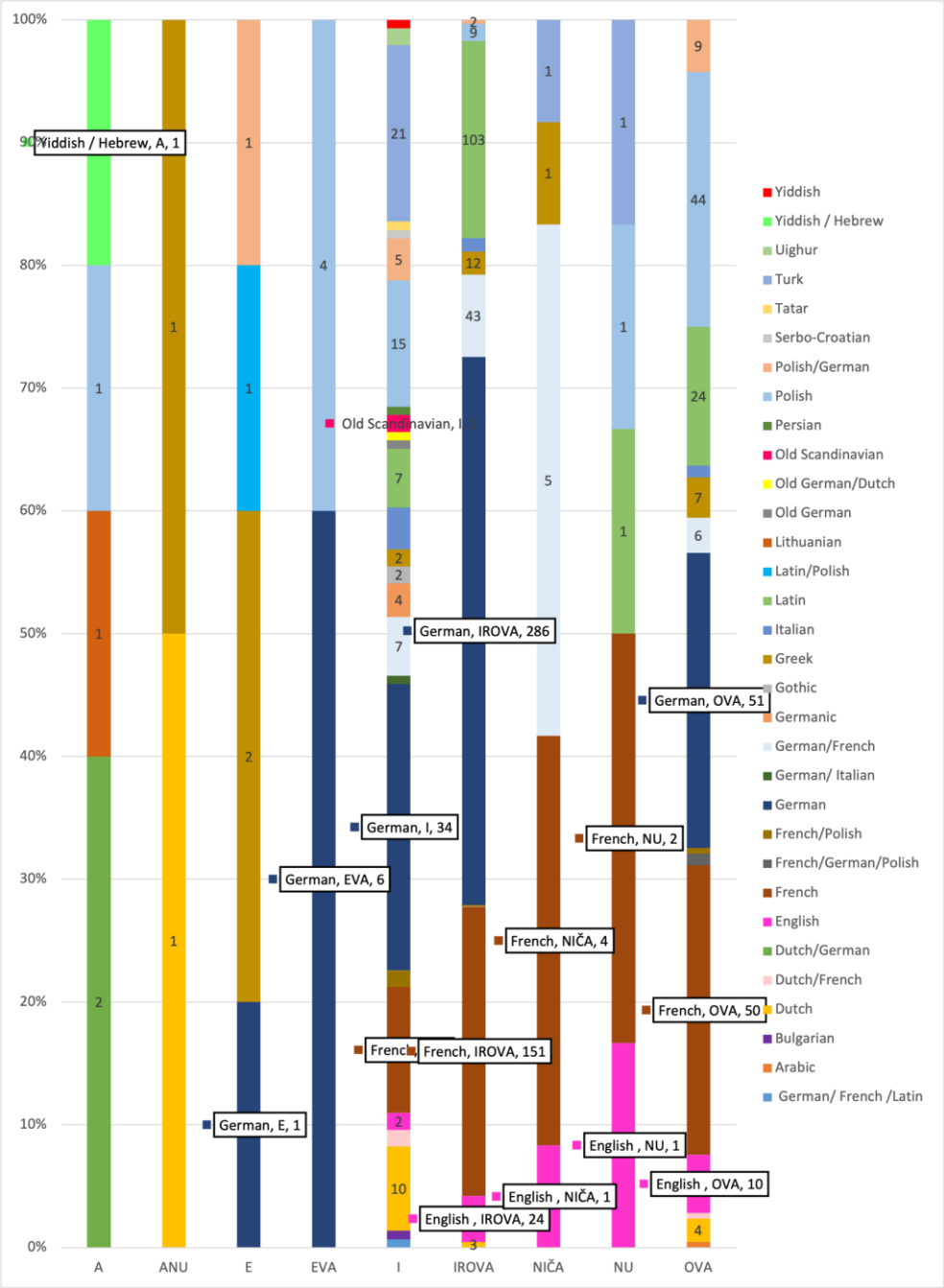


Lemma	POS of base
nervničat’	noun
exidničat’	adjective
pajasničat’	noun
kaprizničat’	adjective
grimasničat’	noun
koketničat’	noun

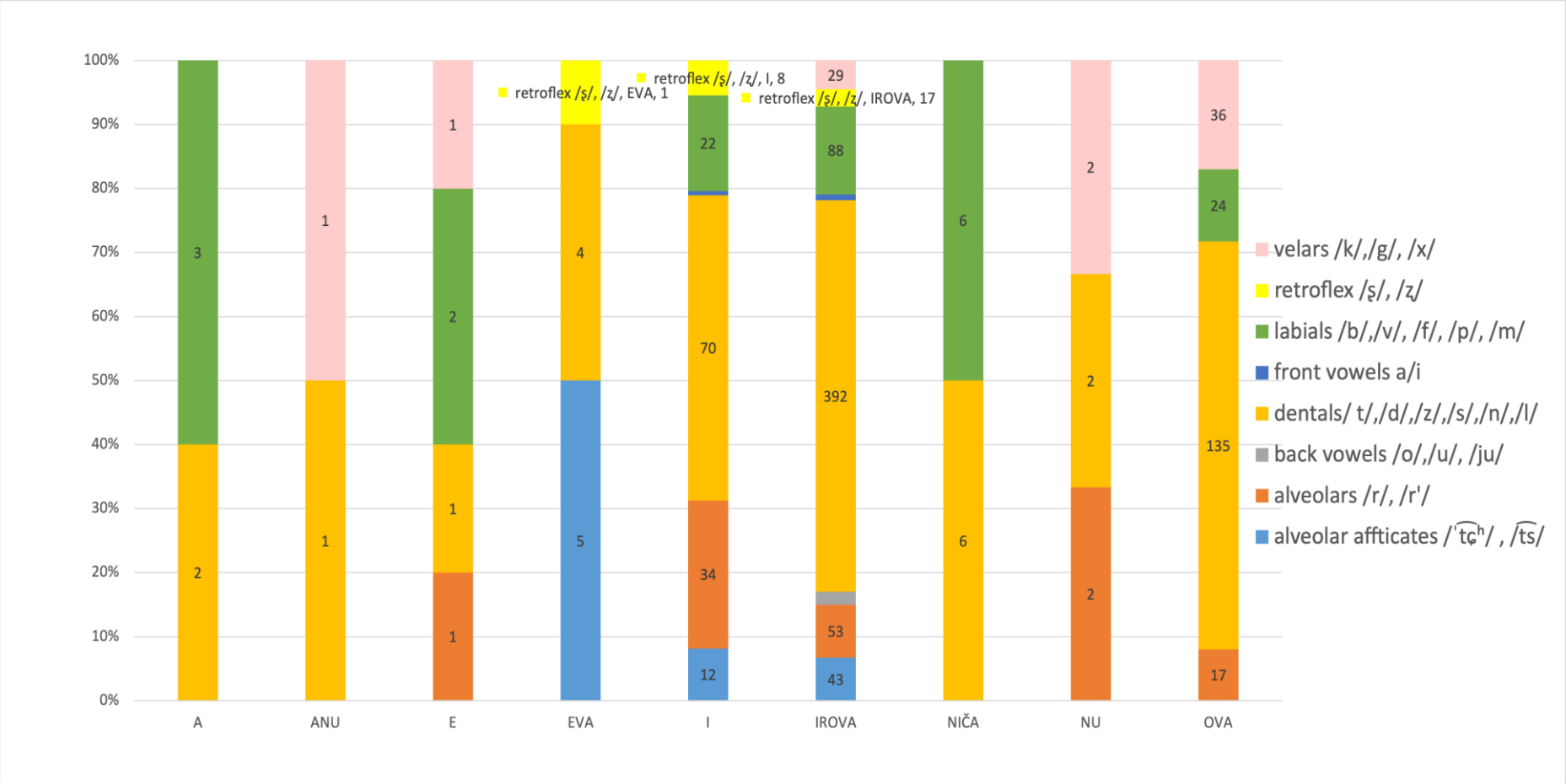
- Loan verbs in –*i*- are mostly associated with nominal bases
- The distribution of base types for –*irova*- and –*ova*- is almost identical.
- Adjectival bases are attested only with -*niča*- (low type frequency). There are only 5 instances of -*niča*- with loan verbs.

Source language





Morpho-phonology



- We found few verbs (13) when *-irova-* was attached to the stem which ends in a back vowel (cf. Švedova et al. 1980)
- *-ova-* and *-irova-* have a similar distribution in terms of the coda of the stem
- *-eva-* is not like its allomorphs, it combines with \t͡s\, \t͡ɕ\
- *-ova- vs. –irova-*:
  - *-ova-* combines with velars more than *-irova-*
  - *-irova-* appears with affricates unlike *-ova-*; combines with back vowels (low type frequency)
- *–nu-* is compatible with alveolars, while *–anu-* is not

Summing up

- Slavic vs. loan stems:
  - -*irova*-: is a purely loan verb marker with rare exceptions
  - -*ova*-: is widely used with both loan and Slavic stems
  - -*stvova*-: is used only with Slavic stems
- Motivating base:
  - General: The major bulk of bases is verbs and nouns. The distribution between nominal and verbal bases is very similar in loan and Slavic verbs
  - Specific: Loan verbs in –*i*- are mostly associated with nominal bases; adjectival bases are attested with -*niča*- (low type frequency)
- Source language:
  - Source language is not a strong predictor (based on the 36% of the data)
- Morphophonology:
  - Few verbs when -*irova*- was attached to the root which ends in a back vowel (cf. Švedova et al. 1980)
  - -*irova*- and –*i*- have the highest compatibility range
  - Although -*ova*- and -*irova*- have a similar distribution in terms of motivating base and source language, morphophonology partially differentiates them

Case study 2
Morphological variation proper: multiple suffixes in Russian and Bosnian

Overview of the “doublets” in the RNC database

- 33 doublet candidates, however some of them present a case of aspectual relations between an imperfective base verb and a Single Act with –*nu*-: *psixovat’*.ipf - *psixanut’*.pf ‘freak out’ ; *riskovat’*.ipf – *risknut’*.pf ‘risk’, etc. Such pairs were excluded.

- The remaining 22 doublets represent a clear-cut semantic split. Cf. *buksovat’* ‘slip, stall’ and *buksirovat’* ‘taw, haul’:
  - Motor tjanul xorošo, kolesa **ne buksovali** po derevenskoj grjazi.
  - ‘The engine pulled well and the wheels **did not slip** in the village mud.’
  - Zatem ego kater **buksirovalsja** k teploxodu.
  - ‘Then his boat **was towed** to the ship.’

- 2 pairs can be analyzed as a case of leveling, whereby one form seems to oust its rival or to restrict it to old-style specific contexts: *blagodarstvovat’* – *blagodarit’* ‘thank’; *darovat’*— *darit’* ‘grant, give’

Doublets in the RNC database

- According to definitions available in dictionaries (Ožegov & Švedova 2001; Švedova 1998), 4 pairs can be seen as overlapping in at least one of the meanings:
- *aktivirovat' – aktivizirovat'* 'activate'
- *bombardirovat' – bombit'* 'bomb'
- *signalizirovat' – signalit'* 'signal'
- *carit' – carstvovat'* 'reign'

However, even in these pairs we observe a split both in terms of semantic nuances and in terms of the frequency of usage.

Doublets in the RNC database

"Doublets" with OVA/IROVA differ in transitivity: OVA verbs are intransitive whreas IROVA verbs are transitive

stem OVA	n OVA	stem IROVA	n IROVA	stem IZIROVA	n IZIROVA	stem I	n I	stem STVOVA	n STVOVA	stem NIČA	n NIČA
		aktivirovat'	73	aktivizirovat'	388						
						blagodarit'	1349	blagodarstvovat'	57		
						blažit'	27	blaženstvovat'	109		
						bodrit'	101	bodrstvovat'	169		
		bombardirovat'	39			bombit'	310				
buksovat'	124	buksirovat'	50								
gazovat'	40	gazirovat'	43								
		garmonirovat'	162	garmonizirovat'	60						
		grimirovat'	34							grimasničat'	71
darovat'	454					darit'	1092				
žalovat'	282					žalit'	139				
						zlobit'sja	23	zlobstvovat'	65		
komandovat'	989	komandirovat'	247								
krasovat'sja	549					krasit'	576				
						mudrit'	96	mudrstvovat'	99		
		nervirovat'	107							nervničat'	753
						plotit'	32			plotničat'	35
				signalizirovat'	120	signalit'	45				
sledovat'	8778					sledit'	686				
formovat'	39	formirovat'	1472	formalizovat'	92						
						carit'	65	carstvovat'	227		
						javit'	144	javstvovat'	168		

aktivirovat’ – aktivizirovat’ ‘activate’

- Japoncy zajavili o namerenii **aktivizirovat’ sotrudničestvo** s regional’nymi stranami i v voenno-političeskoj sfere.
- ‘The Japanese announced their intention to **intensify cooperation** with regional countries in the military-political sphere.’
- Kakie dlja menja mogut byt’ posledstvija, esli **aktivirovat’ kartu** v internet-banke, i NE aktivirovat’ eë potom po telefonu?
- ‘What consequences could there be for me if I **activate the card** in Internet banking and do NOT activate it later by phone?’

bombardirovat’ – bombit’ ‘bomb’

- Ja ne mog ponjat’, kak armija sposobna **bombit’ svoj narod**.
- ‘I couldn't understand how an army could **bomb its own people**.’
- Oni bojalis’ prinimat’ nezvanyx gostej, ešče bol’še bojalis’, čto te v slučae otkaza načnut **bombardirovat’ gorod**.
- ‘They were afraid to receive uninvited guests; they were even more afraid that if they refused, they would begin to **bombard the city**.’
- On prodolžal, ja by skazal, **bombardirovat’ nas svoimi voprosami**.
- ‘He continued, I would say, to **bombard us with his questions**.’

signalizirovat’ – signalit’ ‘signal’

- Ot’’jezžajuščij seryj Hendaj načal **signalit’ levym povorotom**.
- ‘A gray Hyundai driving away began to **signal a left turn**.’
- Ix delo korrektirovat’ vlast’, **signalizirovat’ o narušenijax i perekosax**, i ne bolee togo.
- ‘Their job is to correct the government, **signal violations and imbalances**, and nothing more.’

carit’ – carstvovat’ ‘reign’

- Govorili o tom, čto esli Mixail ne soglasitsja **carstvovat’**, to Russkaja zemlja pogibnet.
- ‘They said that if Mikhail did not agree to **reign**, then the Russian land would perish.’

- V sem’e, gde on objazan byl, po sobstvennomu mneniju, **carit’ i vlastvovat’**, nikakix otklonenij ot ego predstavlenij o domašnix roljax ne dopuskalos’.
- ‘In a family where he was obliged, in his own opinion, to **reign and rule**, no deviations from his ideas about household roles were allowed.’

- Polnyj xaos načinaet **carit’ na dorogax**.
- ‘Complete chaos begins to **reign on the roads**.’

formovat' – formirovat' – formalizovat'

- *formovat':* When processing, to give something some kind form. ***Formovat' glinu*** 'Shape clay'.
- *formirovat':* 1. To give something a certain form, completeness, generate. *Surovaja žizn'* ***formiruet sil'nye xaraktery*** 'Harsh life builds strong characters'. 2. Create, compose, organize (some kind of team, military unit, etc.). ***Formirovat' pravitel'stvo*** 'Form a government'
- *formalizovat':* Represent the content side of a phenomenon in the form of a formal system. ***Formalizovannyj jazyk*** 'Formalized language'

Bosnian Data

- **Bosnian Web Corpus (bswac 1.2)**
- ca. 248 mln. tokens
- lemmatized corpus
- search for lemmas in *–irati*, *-isati*, *-ovati* /*-evati* / *-uvati*
- Caveat: texts written in Bosnian, Croatian and Serbian varieties are assembled in the corpus but aren‘t marked for the variety

stem ovati	n ovati	stem irati	n irati	stem isati	n isati
destabiliz	74	destabiliz	415	destabil	3
destil	15	destil	36	destil	2
generaliz	91	generaliz	343	general	15
iskristaliz	7	iskristaliz	214	iskristal	119
koncentr	1	koncentr	1338	koncentr	588
kristaliz	4	kristaliz	153	kristal	36
lob	124	lob	1129	lob	1
mobiliz	16	mobiliz	604	mobil	212
model	29	model	246	model	1
neutraliz	29	neutraliz	602	neutral	214
paraliz	46	paraliz	361	paral	112
prodefil	171	prodefil	126	prodefil	2
proklam	54	proklam	137	proklam	2
racionaliz	25	racionaliz	196	racional	2
redefin	1	redefin	268	redefin	96
relativiz	17	relativiz	458	relativ	1
selekt	67	selekcion / selekt	21 / 181	selekcion	3
simboliz	52	simboliz / simbol	1614 / 7	simbol	61
stabiliz	360	stabiliz	1169	stabil	2
steriliz	4	steriliz	148	steril	38
titl	35	titul	59	titul	4

in sum 21 triplets in bswac-corpus

	Overlap in %	Total
-ovati	1.5%	1406
-irati	1.08%	1934
-isati	4.7%	445

Overview of the Bosnian data

- variation in both roots and suffixes
  - e.g. *neutraliz-irati* vs. *neutral-isati* but not **neutralis-ati*
  - B / C / S have highly phonetic orthography, e.g. *Srbija* but *srpski*
  - therefore an alternation in the root is highly unlikely in a phonetically similar environment, as given in e.g. *neutrali**z**irati* vs. *neutrali**s**ati*

Yet there is method in it?

Dajte svoje mišljenje Da li ste se ikada zapitali: **Modelirati** ili **modelovati**? **Instalirati** ili **instalisati**? **Kodirati** ili **kodovatii**? **Prezentirati** ili **prezentovati**? A moze i gore: **Kristalizirati**, **kristalizovati** ili **kristalisati**? **Paralizirati, paralizovati** ili **paralisati**? **Koncentrirati**, **koncentrovati** ili **koncentrisati**? Vjerovatno jeste. Zato sam pokrenuo temu u obliku jezicnog savjetnika i bez suvisne politike molim. (bsWaC.164244)

‚Give your opinion. Have you ever asked yourselves: **Modelirati** or **modelovati**? **Instalirati** or **instalisati**? **Kodirati** or **kodovatii**? **Prezentirati** or **prezentovati**? And it can even be worse: **Kristalizirati**, **kristalizovati** or **kristalisati**? **Paralizirati, paralizovati** or **paralisati**? **Koncentrirati**, **koncentrovati** or **koncentrisati**? It probably is. That's why I raised the topic in the form of language counselling and without superfluous political statements, please.’

Full semantic split: *titulirati* & *titlovati*

- […] *rascjepkana (bivša) Jugoslavijo, još malo pa ćemo da* ***titlujemo*** *srpske filmove zbog ekavice*, […] (bsWaC.32183.10)
- ‚Oh split (former) Yugoslavia, we're about to subtitle Serbian movies because of the ekavica.’

- *Mnogi su Komšića* ***titulirali*** *kao novog Tita* […] (bsWaC.48813)
- ‘Many have dubbed Komšić the new Tito.’

Selekcionirati, selektirati, selektovati & *selekcionisati* Split in aspectual meaning?

- **Fokus on process**
- […] *mukotrpno godinama* ***selekcionirali*** *ekipu*. (bsWaC.698548.119.2)
- ‚in painstaking work of several years they have been selecting a team‘
- *Tu je naš koordinator Murat Jaha sa selektorima omladinskih selekcija […] otišao u Švedsku gdje su na licu mjesta* ***selektirali*** *oko 75 najkvalitetnijih momaka različitih godišta.* (bsWaC.4032.4.8)
- ‘There our coordinator Murat Jaha with the selectors of the youth selections [...] went to Sweden where they selected about 75 of the best boys of different ages on the spot.’

- **Focus on result**
- *Vjerujem da smo* ***selektovali*** *dobar tim* […] (bsWaC.412420.8.3)
- *‘I believe we have selected a good team.’*
- […] *korištenjem novih domaćih sorti žitarica koje su* ***selekcionisali*** *stručnjaci ove naučne i stručne institucije.* (bsWaC.835763.2.1)
- ‚by using new domestic varieties of cereals which the experts of this scientific and professional institution have selected.’

Paralizovati & paralizirati
Split in aspectual meaning?

- **Perfective / resultative reading of perfect tense**
- […] *i **dok** me **je** strah **paralizovao** , on* […] *je sjedio na sečiji* (bsWaC.452822)
- ‘and while I was paralyzed by fear (lit. fear had paralyzed me), he was sitting on the sofa.’
- *Dvodnevni generalni štrajk, koji **je** od jučer **paralizirao** život u Grčkoj*, […] (bsWaC.72075)
- ‘A two-day general strike, which has paralyzed life in Greece since yesterday’

- **Perfective / resultative reading of Verlaufspassiv**
- *Lijeva polovina lica **se paralizovala** tokom iduće dvije godine*. (bsWaC.58105)

  ‘The left half of the face was paralyzed over the next two years.’
- *Billie dolazi u školu magije uništiti Dogana, ali se prisjeti traume iz djetinjstva i **paralizira se***. (bsWaC.53689)

  ‘Billie comes to a school of magic to destroy Dogan, but recalls her childhood trauma and becomes paralyzed.’

Perfective / resultative reading of infinitive

- *[…] tisuće ljudi će rado platiti da im netko u lice ubrizga otrov koji može **paralizirati** mišiće lica do šest mjeseci.* (bsWaC.154543)
- ‘Thousands of people will gladly pay to have someone inject their face with a poison that can paralyze facial muscles for up to six months.’

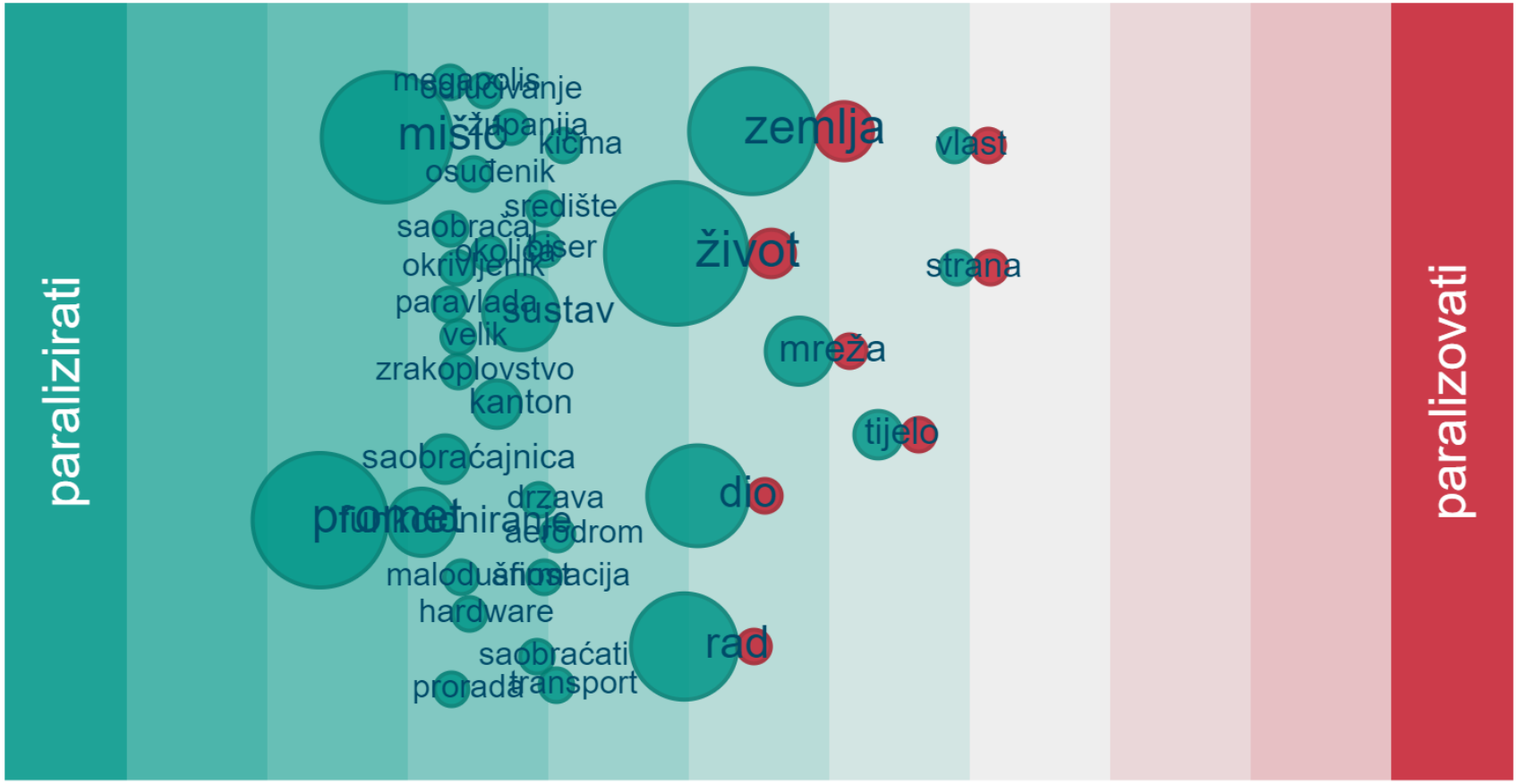
Paralizovati & *paralizirati* & *paralisati* Light split: Collocations

- *Paralizirati* is attested with two readings

1. Physical impairment
2. Metaphorical reading of

- *paralizovati* and *paralisati* are attested mainly with metaphorical reading (with some exceptions to the rule)

Paralizovati & *paralizirati* & *paralisati*
Light split: Collocations



← mostly with paralizirati equally frequently with paralizirati and paralizovati mostly with paralizovati →

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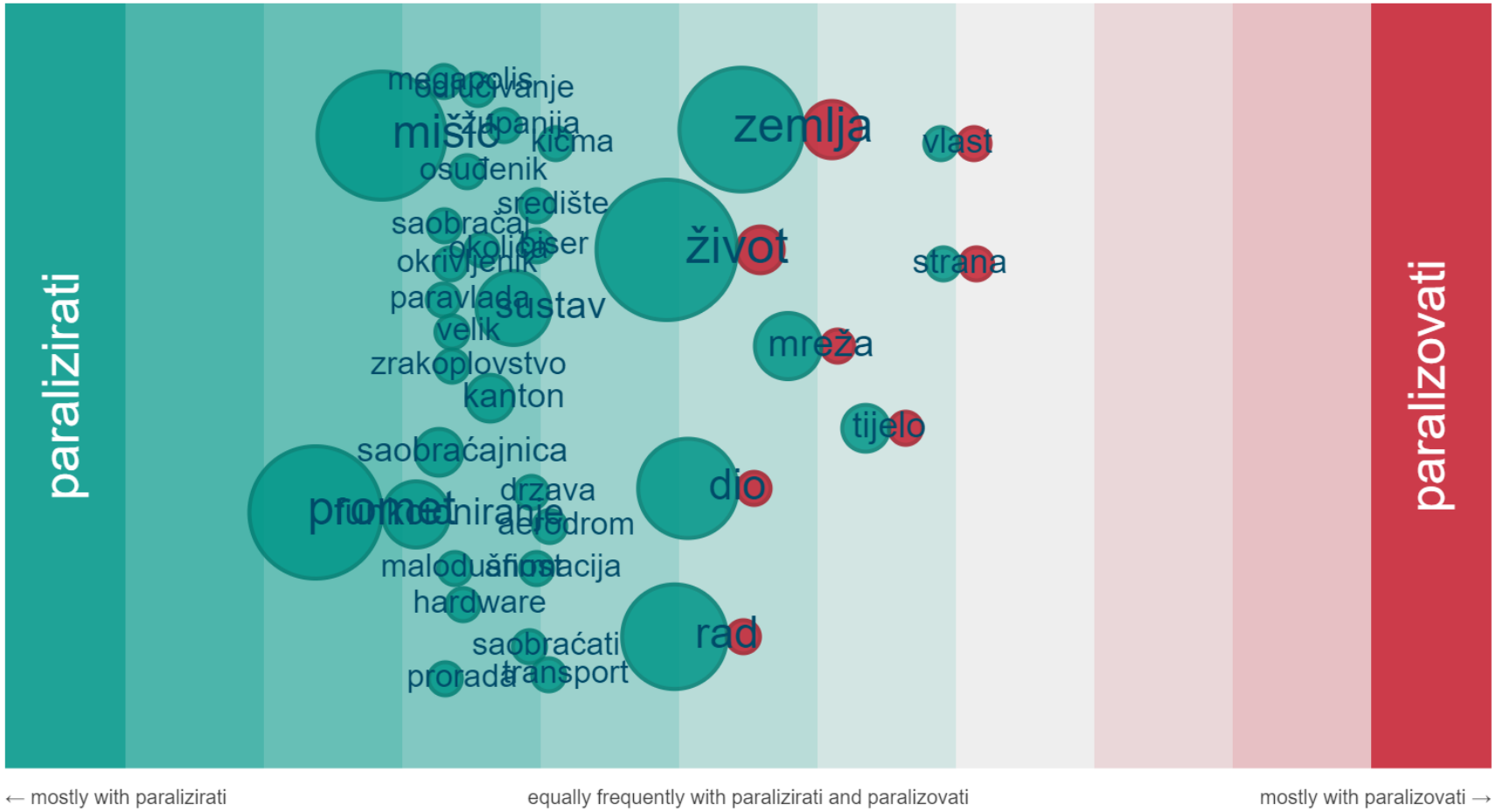
Paralizovati & paralizirati & paralisati
Light split: Collocations



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Paralizovati & *paralizirati* & *paralisati*
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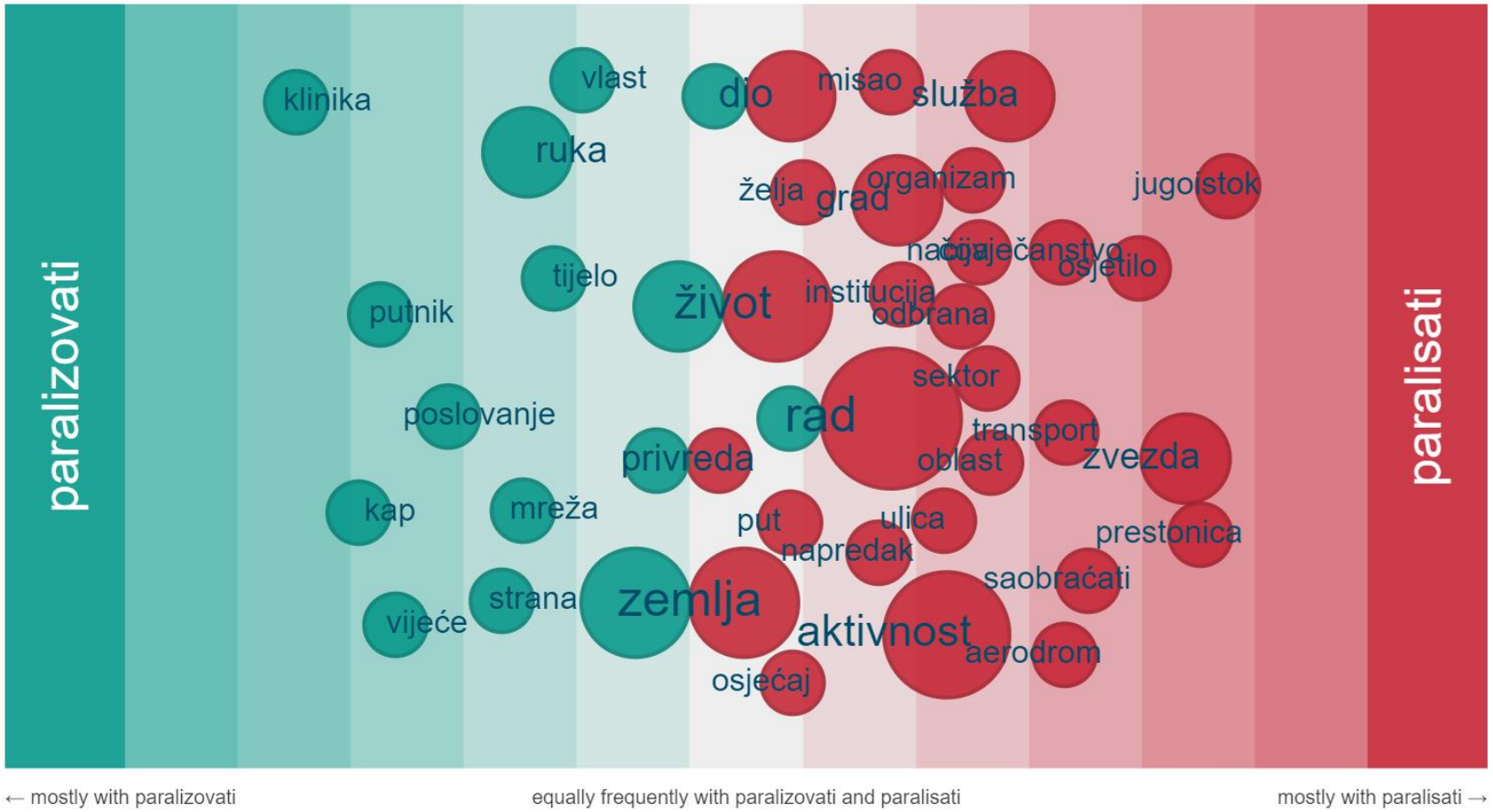

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Sterilizirati vs. *sterilisati*
Light split: collocations

- ***Sterilizirati* with 2 readings**

1. Sterilize a device
2. sterilize a female

- *Čvrsto zatvorite i* ***sterilizirajte*** *oko 30 minuta.* (bsWaC.22488)
- ‘Close tightly and sterilize for about 30 minutes.’
- […] *potrebno je raditi na tome da* ***se*** *sve napuštene životinje* ***steriliziraju*** . (bsWaC.43794)
- , it is necessary to continue the efforts so abandoned animals are sterilized.‘

- **Sterilisati attested almost exclusively with reading 2.**
- […] *gdje se psi* ***sterilišu*** *, vakcinišu, čipuju* […]
- ‚where dogs are sterilized, vaccinated and chipped.‘

Neutralisati, neutralizovati & *neutralizirati* Light split: collocations

- Only *neutralisati* is attested with basic ‚natural scientific‘ reading

- *Dezodoransi* ***neutrališu bakterije*** *koje izazivaju neprijatne mirise* […] (bsWaC.48601)
- ‘Deodorants neutralize bacteria that cause bad smells.’

- […] taj **instikt se neutrališe** kada su gladne. (bsWaC.61464)
- ‘That instinct is neutralized when they are hungry.’

Neutralisati, neutralizovati & neutralizirati Light split: collocations

- all three lexemes display metaphorical reading
- […] *premijer Luksemburga Žan Klod Junker […] se kandidovao "da bi* ***neutralizovao Blera****".* (bsWaC.375635)
- ‘Luxembourg's Prime Minister Jean-Claude Juncker ... was running " to neutralize Blair’
- […] ***neutralizira političke protivnike*** *i neistomišljenike*. (bsWaC.64532)
- ‚He neutralizes political opponents and dissenters.’
- *Američki federalni istražni biro (FBI) tvrdi da je* ***neutralisao hakersku grupu*** *Anonymous* […] (bsWaC.27078)
- ‘FBI claims to have neutralized the hacker group Anonymous’

Full overlap: *Generalisati, generalizirati* & *generalizovati*

- […] ***generalisati stvari*** […](bsWaC.372391)
- ‚generalize things‘
- ***generaliziraš stvari***. (bsWaC.31707)
- **‚**you generalize things‘
- *sam* […] ***generalizovala stvari***. (bsWaC.60031)
- ‚I have generalized things.‘

Full overlap: *Simbolizovati, simbolizirati, simbolirati* & *simbolisati*

- *Prema tradiciji, maske su **simbolizovale** zle duhove iz stare godine* […]. (bsWaC.209687)
- ‘According to tradition, the masks symbolized the evil spirits of the old year.’
- *Zelena **simbolizira** buđenje i mladost*. (bsWaC.79713)
- ‚Green symbolizes awakening and youth’
- *Bogorodica **simboliše** crkvu* […] (bsWaC.44163)
- ‚The Virgin Mary symbolizes the church.’
- *Oni su na trg izašli u bijelim majicama koje **simboliraju** mir i čistoću* […]. (bsWaC.208887)
- ‘They came to the square in white shirts symbolizing peace and purity’

Summing up

- In Slavic languages loan verbs contribute to morphological variation to a different degree.
- While suffix variation is relatively marginal in Russian (and mostly leads to a semantic split), it is more common in South Slavic.

Further steps

- “Derivational” potential of the stems with different suffixes: For each suffix, we will define what kind of clusters are typical, how sizable they are, and what kind of derivatives they include, and present a comparative analysis of clusters associated with different suffixes.
- Analyze the overall productivity of the suffixes in different time periods

Thank you for your attention!