

Phonological and morphological variation in Botlikh: Comparing two dictionaries

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Botlikh

- ▶ Botlikh < Andic < Avar-Andic-Tsezic < East Caucasian
- ▶ Spoken by ~5,000-8,000 speakers
- ▶ Three villages in the Botlikh district of the Republic of Daghestan: Botlikh, Miarso, and Ashino
- ▶ Unwritten and mostly spoken at home; the Cyrillic script of Avar functions as an ad hoc writing system on social media
- ▶ Evaluated as “threatened” by Ethnologue **Simons & Fenning (2018)**, but many children still speak the language and attitudes are positive
- ▶ Heavy influence from Avar and Russian

Botlikh

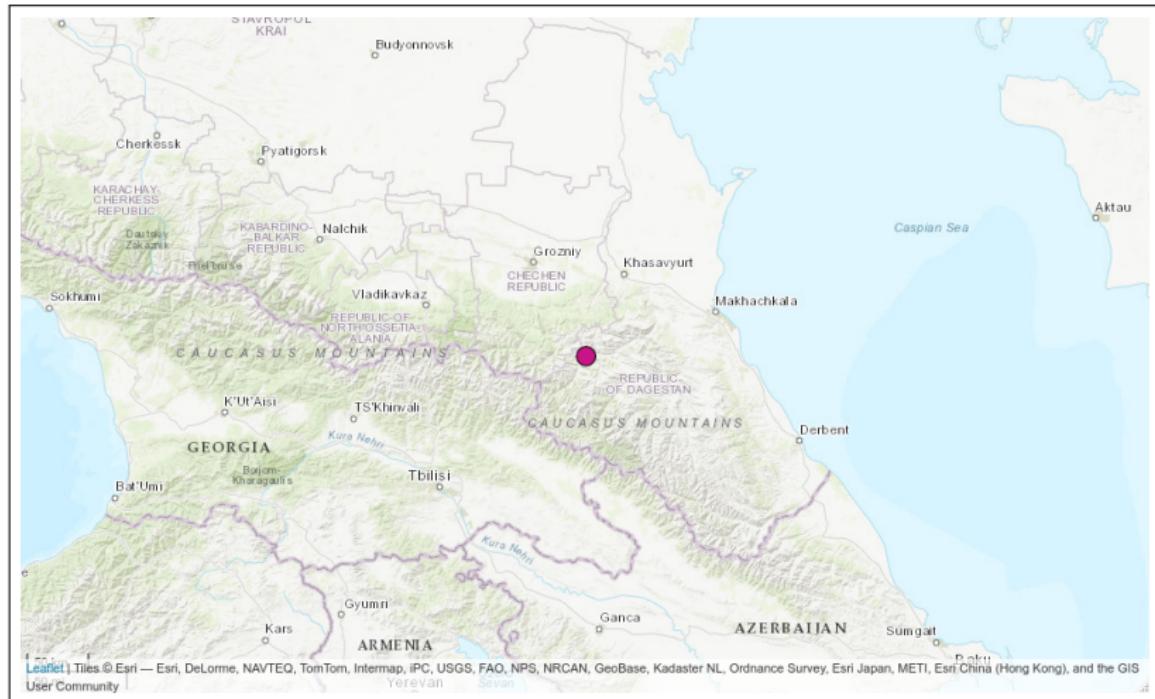


Figure 1: Botlikh on the map

Botlikh literature

- ▶ One full reference grammar in Georgian [Gudava \(1962\)](#)
- ▶ Several short sketches mostly based on information contained in the grammar by Togo E. Gudava: [Gudava \(1967\)](#), [Azaev \(2000\)](#), [Saidova \(2001\)](#), [Magomedbekova \(2001\)](#), [Xalidova \(2017\)](#), [Alekseyev & Verhees \(Forth.\)](#)
- ▶ Several works on the lexicon and word formation [Azaev \(1975\)](#), [Sulejmanova \(2013\)](#), [Alekseyev \(2016\)](#)
- ▶ In general poorly described compared to other Andic languages like Godoberi or Bagvalal, BUT two Botlikh-Russian dictionaries are available to date [Saidova & Abusov \(2012\)](#), [Alekseev & Azaev \(2019\)](#)

Two dictionaries



Figure 2: Two Botlikh-Russian dictionaries

Two dictionaries

- ▶ Saidova & Abusov (2012) compiled in the 2000s by a native speaker of Botlikh (Magomed G. Abusov) and an experienced linguist (Patimat A. Saidova)
- ▶ Alekseev & Azaev (2019) compiled in the 1960s/1970s by a native speaker of Botlikh and philologist (Xalil G. Azaev), later (in the 2000s) systematized by an experienced linguist (Mixail E. Alekseev), and published posthumously after the editing by Timur A. Maisak

Two dictionaries

- ▶ Comparable both quantitatively and qualitatively
- ▶ ~8,000 headwords for Saidova & Abusov (2012) vs. ~9,000 words and expressions for Alekseev & Azaev (2019)
- ▶ Although the data in Alekseev & Azaev (2019) were collected several decades earlier, Magomed G. Abusov also consulted elderly speakers with the aim of collecting archaic vocabulary
- ▶ Saidova & Abusov (2012) also contains some notes on Miarso; reference to Miarso variants is not explicit in Alekseev & Azaev (2019), but it seems that such variants are occasionally reported in this dictionary too
- ▶ No metadata on the speakers consulted
- ▶ At first glance, the two resources seemed to display variation

Our research

- ▶ Comparison of the two resources
- ▶ A unique opportunity to conduct a quantitative investigation of an understudied language
- ▶ Provide numerical approximations for the impressionistic observations available in the existing literature
- ▶ Analysis of both phonological and morphological features
- ▶ Detect patterns of systematic variation within these two areas

Outline

- ▶ Data
 - ▶ merging
 - ▶ extracting grammatical information
 - ▶ pairing and annotation
- ▶ Analysis
 - ▶ phonology (George Moroz)
 - ▶ nominal morphology (Chiara Naccarato)
 - ▶ verbal morphology (Samira Verhees)
- ▶ Results and discussion
- ▶ Methodological remarks

Merging (George Moroz)

From two .doc files to one .xls:

- ▶ .doc preprocessing: convert files to .html, change non-standard symbols, solve several tag problems (I, H, etc.)
- ▶ extract first bold entrance, parse parenthesis for grammar information

A	B
АБАКЕ бом. түркмек вхуджанлыгын (кустарын) нате; <i>тапшыл</i>	авадынбарлык масаты бүлкүк говорки о своем жиендердестине;
АБАЗДЫЛ парсы 1) иштеге; <i>абаздан</i> тынычы гүлүш дең баштакы ноккода я к бим жаңы приду 2) иш; <i>абаздан</i> ильмөвли гүлүшүн түбүн иш за чо что не следует он этого	распоряжения гүлүшем кызыптын чөлөнүүнүн жыны; распоряду ильмөвли гүлүшем кызыптын; <i>авадын</i> жиендердестине; <i>авадын</i>
АБАДАЛ-ЧАЛАГЫЛТЫР та же, что абадалык	и АВАЛ III (түбүн) абсолютен;
АБАДЫНАВ I (түбүн) абсолютен	АВАЛ III (түбүн) абсолютен;
АБАДЫНАВ II (-тында) абсолютна	и АВАЛ III (түбүн) абсолютен; <i>абазын</i>
АБАДЫНАЛ (түбүн) абсолютен	абайдыла жиенном образом
мундай обненесий жасы	абадын-бечим
АБАДЫ (имре) сок. <i>тыйызб</i>	абадыл-абадыл, рж. -ильм усун. вечность
АБАДЫ (имре) сок. <i>тыйызб</i>	абарина, им. -е, рж. -ильм оборона; <i>абарина</i> биккы оборонял; <i>абарина</i> м оборонительный
АБАДЫРХАМ (имре) сок. <i>тыйызб</i>	абдэй, ким абы, все абыл призыва, личь ненадолго, поисжат; <i>абду</i> бүлкән приклонитъ
АБАДЫСУ (имре) сок. <i>тыйызб</i>	иңгылыш
АБАДЫСУСУ (имре) сок. <i>тыйызб</i>	абайлан, им. -ильм обываление; <i>гаёйтана</i> абайланы обываление в газете;
АБАДЫСУСУСУ (имре) сок. <i>тыйызб</i>	гаёйтана, абайланы или дата обываление в газете; <i>абайлан</i> бухах, <i>абайлан</i> кийланы, <i>абайлан</i> түйләп хөкмить обываление
АБАДЫСУСУСУСУ (имре) сок. <i>тыйызб</i>	абирт, им. -ильм, рж. -ильм абирт; <i>абирт</i> ишле аборт; Гыйы тышкына азалими
АБАДАМАТ III (-ыны, -абалы)	абирт ишле! Эта женщина сделала абирт
автомат (робот антимонитского спиритозного оружия); <i>абитаматтык</i> <i>бахадыр</i>	авадыл просторный; <i>авадыл</i> яхм просторный сал; <i>авадын</i> байкыла шедрая душа
автаматтык кылъыттарлай	авадынлык I. простор, 2. щедрость
автомат; <i>абитаматтык</i> <i>бахадыр</i>	авал-ахир конец света; <i>авал-ахир</i> зиярәт зиярәттәр кийли на том свете встретимся; <i>авал-ахир</i> түгүл-түгүл сюзү
АБАТАРДЫЧКА III (-ым, -балы)	авара, им. -ильм, рж. -ильм помеха, преграда
автомат; <i>абитаматтык</i> <i>бахадыр</i>	авария им. -ильм, рж. -ильм пророк Мусы (Монсей); <i>авария</i> реиниевская будой миссиа I) разруг; II) Млечный путь
автомат; <i>абитаматтык</i> <i>бахадыр</i>	авария им. -ильм, рж. -ильм пророк Мусы (Монсей); <i>авария</i> реиниевская будой миссиа I) разруг; II) Млечный путь
автомат; <i>абитаматтык</i> <i>бахадыр</i>	авария, им. -ильм, рж. -ильм; <i>авария</i> иткэ сөрөнчүйт авария
автомат; <i>абитаматтык</i> <i>бахадыр</i>	аиншар жыныштык жыныштык ишкүр кыятт жыныштык бите! Я послал письмо авария
автомат; <i>абитаматтык</i> <i>бахадыр</i>	авария жыныштык жыныштык ишкүр кыятт жыныштык бите!
автомат; <i>абитаматтык</i> <i>бахадыр</i>	авария жыныштык жыныштык ишкүр кыятт жыныштык бите!
автомат; <i>абитаматтык</i> <i>бахадыр</i>	автобиография им. -ильм, рж. -ильм автобиография; Деб автобиографиялайла беси

Figure 3: Merging the dictionaries
[github/agricolamz/2020.03.24_NIS_dictionaries](https://github.com/agricolamz/2020.03.24_NIS_dictionaries)

Extracting grammatical information

- ▶ Total number of lexemes extracted: 8,464 from Saidova & Abusov (2012) and 6,821 from Alekseev & Azaev (2019)
- ▶ Nouns: 2,871 from Saidova & Abusov (2012) and 3,097 from Alekseev & Azaev (2019)
 - ▶ grammatical information: genitive and plural
- ▶ Verbs: 1,504 from Saidova & Abusov (2012) and 1,640 from Alekseev & Azaev (2019)
 - ▶ grammatical information: habitual and aorist

Extracting grammatical information

lemma	pos	noun_gen	noun_pl	verb_prs	verb_pst	reference
арбаглзив	noun	-лъи				Saidova, Abusov
арджан	noun	-алъи	-			Alekseev 2006
арёнда	noun	-лъи				Saidova, Abusov
аржаж/áй	verb			-аймалé	-ó	Saidova, Abusov
аржái	verb			-é	-o	Alekseev 2006
арж/áй	verb			-áймале	-ó	Saidova, Abusov
áржар	noun	-лъи	-дé			Alekseev 2006
аржíй	verb			-é	-a	Alekseev 2006
арж/и	verb			-e	-o	Saidova, Abusov
.						- - -

Figure 4: The database

Pairing

We manually checked for lexemes represented in both dictionaries to carry out phonological and morphological analysis

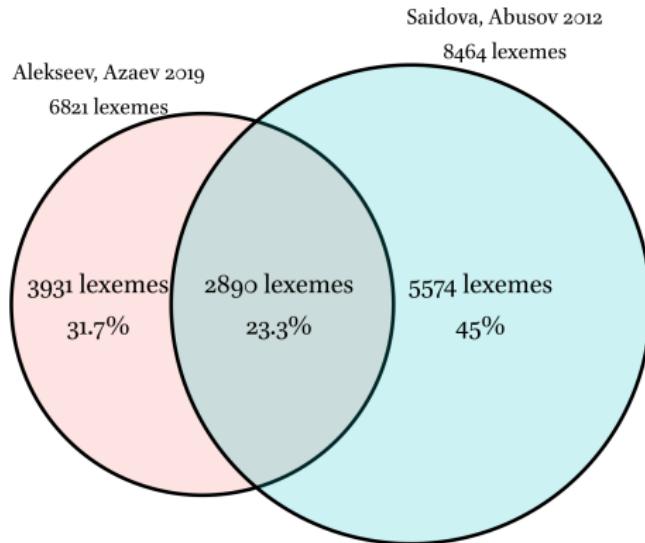


Figure 5: The database

Pairing

We manually checked for lexemes represented in both dictionaries to carry out phonological and morphological analysis

- ▶ Those 2890 includes all POS
- ▶ There are also multiple entrance of the same root
Alekseev & Azaev (2019): *besqχé* 'behind', *besqχéku* 'from behind'
besqé-ssu-b 'back/hind (adjective)' *héči besqérussubla* 'in the end'
- ▶ there are also some sayings and proverbs that constitute separate entrance in a dictionary (about 670)
héči besqχérussubla 'in the end'

Annotation

- ▶ Manual correction of automatically extracted information about grammatical features
- ▶ Addition of further annotation (for features that appeared to be potentially relevant for our research):
 - ▶ masdars
 - ▶ borrowings
- ▶ (In progress) Filter out superfluous entries for multi-word expressions and inflected forms

Phonology

- ▶ There are 1996 lexemes which look phonetically the same, and 909 are different (31%)
- ▶ If we remove the stress sign, there are 2449 lexemes which look phonetically the same, and 456 are different (16%)
 - ⇒ 15% of lexemes have different stress pattern?..

Phonology

- ▶ There are 1996 lexemes which look phonetically the same, and 909 are different (31%)
- ▶ If we remove the stress sign, there are 2449 lexemes which look phonetically the same, and 456 are different (16%)
 - ⇒ 15% of lexemes have different stress pattern?.. Yes, but including 265 (9%) cases where stress is present in one dictionary and absent in the other.
- ▶ What causes the difference between dictionaries?
 - ▶ Stress pattern differences in 188 lexemes (about 6%)
 - ▶ Multiple cases where there is a small difference that could be explained either as a typo or in terms phonological variation: *čuhí* 'to run' [aa] vs. *čūhí* [sa], *kusu* 'cherry plum' [aa] vs. *kussu* [sa]
 - ▶ Multiple cases where Russian borrowings were adopted differently: *awtobus* 'bus' [aa] vs. *abtabus* [sa], *biton* 'milk can' [aa] vs. *bitun* [sa], *apteka* 'pharmacy' [aa] vs. *abteka* [sa]
 - ▶ Morphological preferences: *dinija-w* 'pious' [aa] vs. *dinija-b* [sa]

Phonology: segments

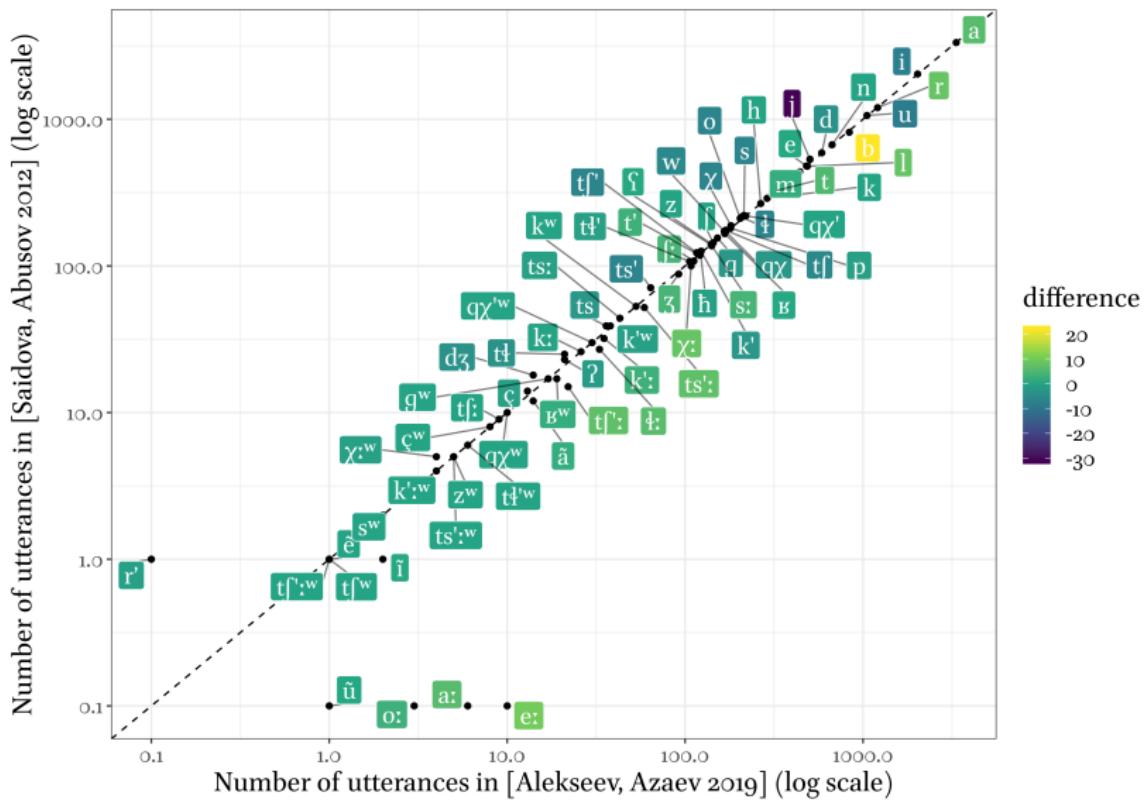
About 25 cases:

Alekseev & Azaev (2019)	Saidova & Abusov (2012)	
<i>ãhajr</i>	<i>ãhar</i>	'message'
<i>bezajr</i>	<i>bezir</i>	'roasting'
<i>mik'kujr</i>	<i>mik':ur</i>	'swallowing'
<i>reqχujr</i>	<i>reqχʷir</i>	'fight'
<i>refkujr</i>	<i>refkur</i>	'overnight stay'
<i>rikʷajr</i>	<i>rikʷar</i>	'lighting'
<hr/>	<hr/>	<hr/>
<i>χwardar</i>	<i>χwardir</i>	'digging'
<i>mi?ar</i>	<i>mi?ar</i>	'nose'
...

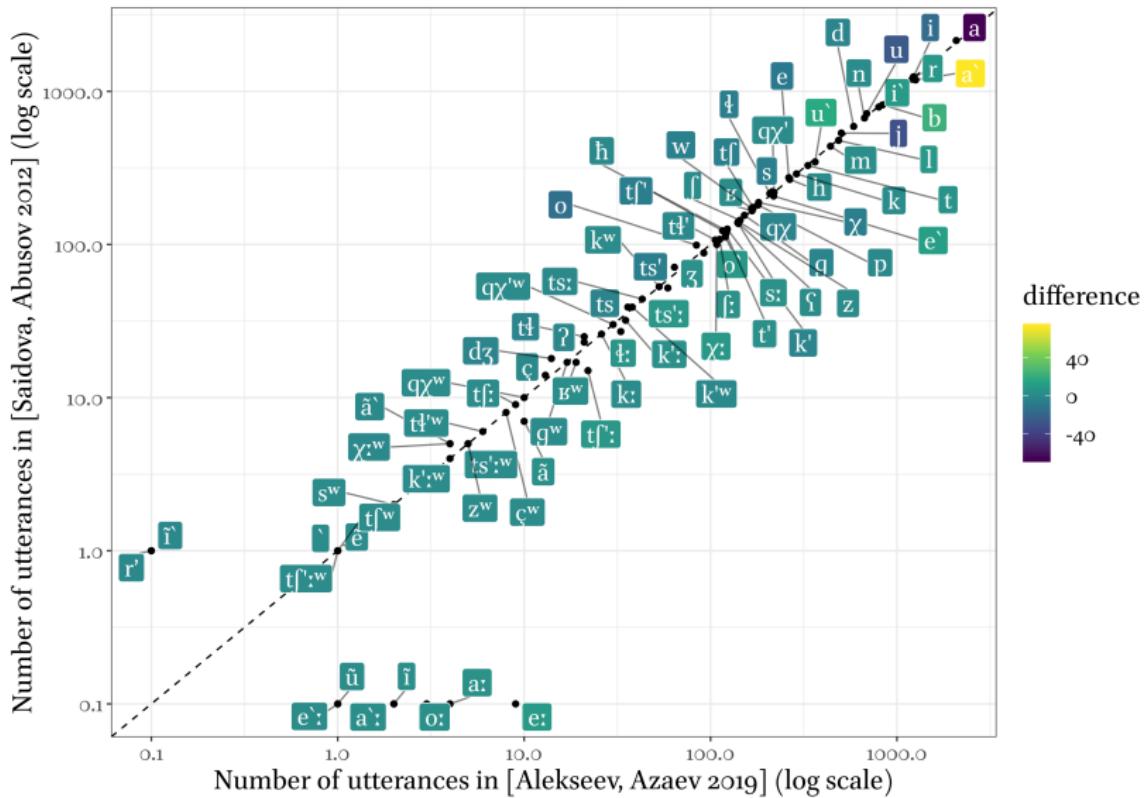
About 6 cases:

<i>f:alaj</i>	<i>f:allaj</i>	'silt'
<i>inuʃala</i>	<i>inuʃalla</i>	'everywhere'
<i>ʃila</i>	<i>ʃilla</i>	'reason'

Phonology: compare Botlikh segments



Phonology: compare Botlikh segments

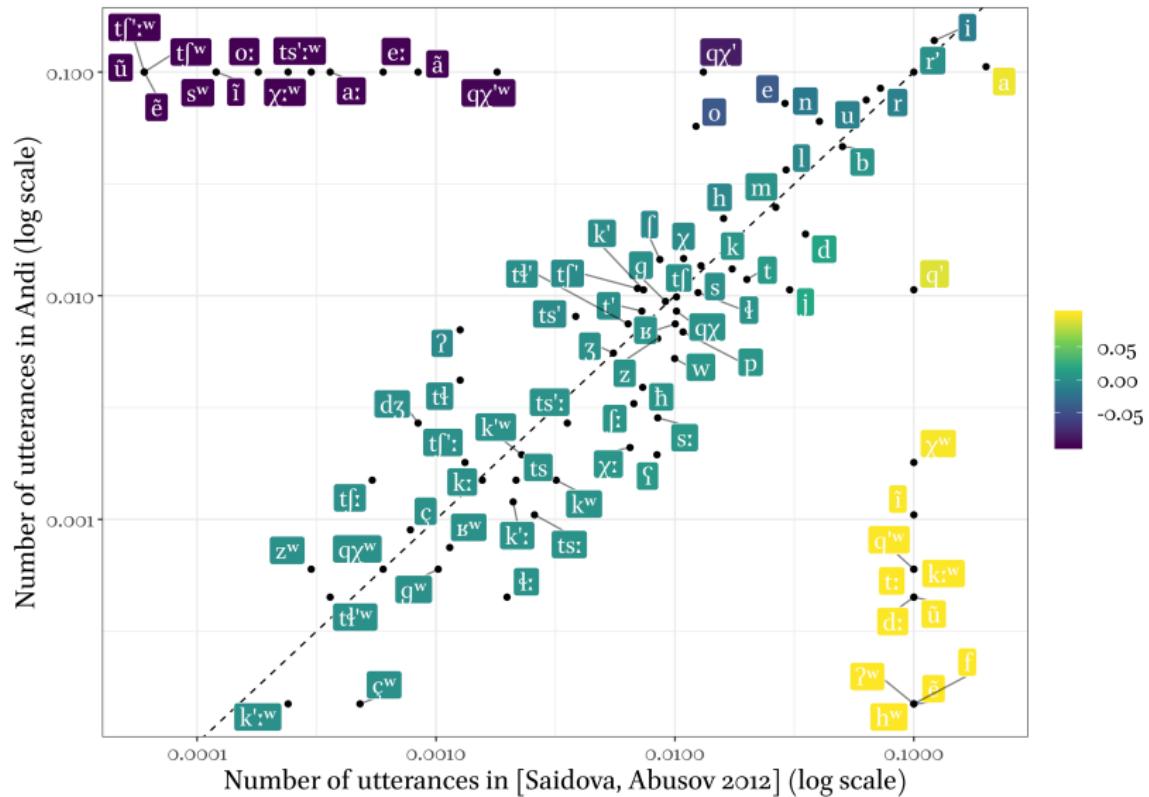


Zilo Andi data

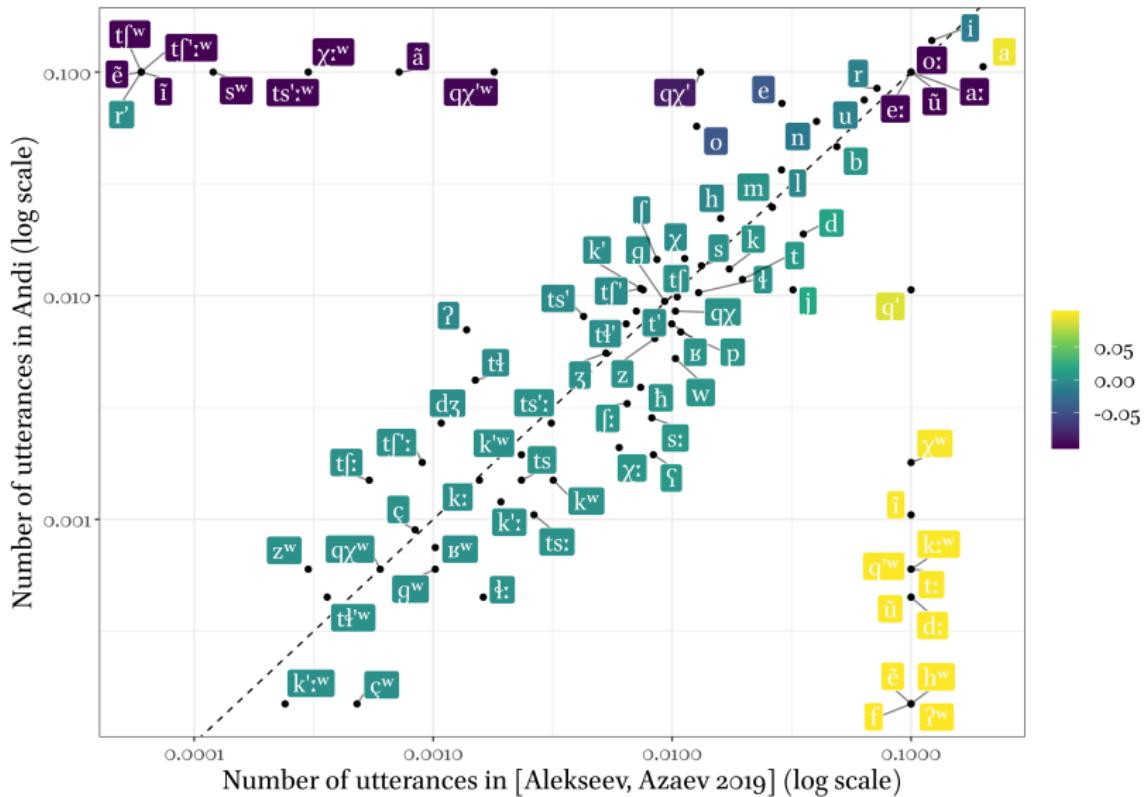
Dictionary data for Zilo were collected during fieldtrips to Zilo in 2016–2019 with N. Rochant, S. Verhees, A. Martynova and A. Zakirova who contributed to the same FieldWorks project.

- ▶ Contain morphological affixes
- ▶ Doesn't contain additional affixes in a lemma form
- ▶ Contain different stems of the same lexeme (e. g. SG.ABS, SG.OBL, PL.ABS, PL.OBL, PST, NPST). Those forms were removed during the analysis.
- ▶ No information about stress

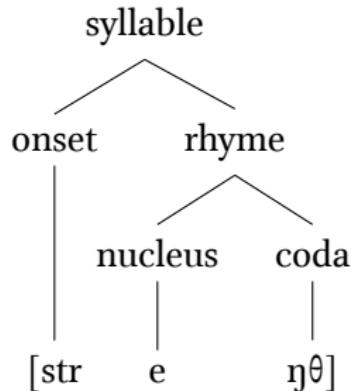
Phonology: compare Botlikh and Zilo segments



Phonology: compare Botlikh and Zilo segments

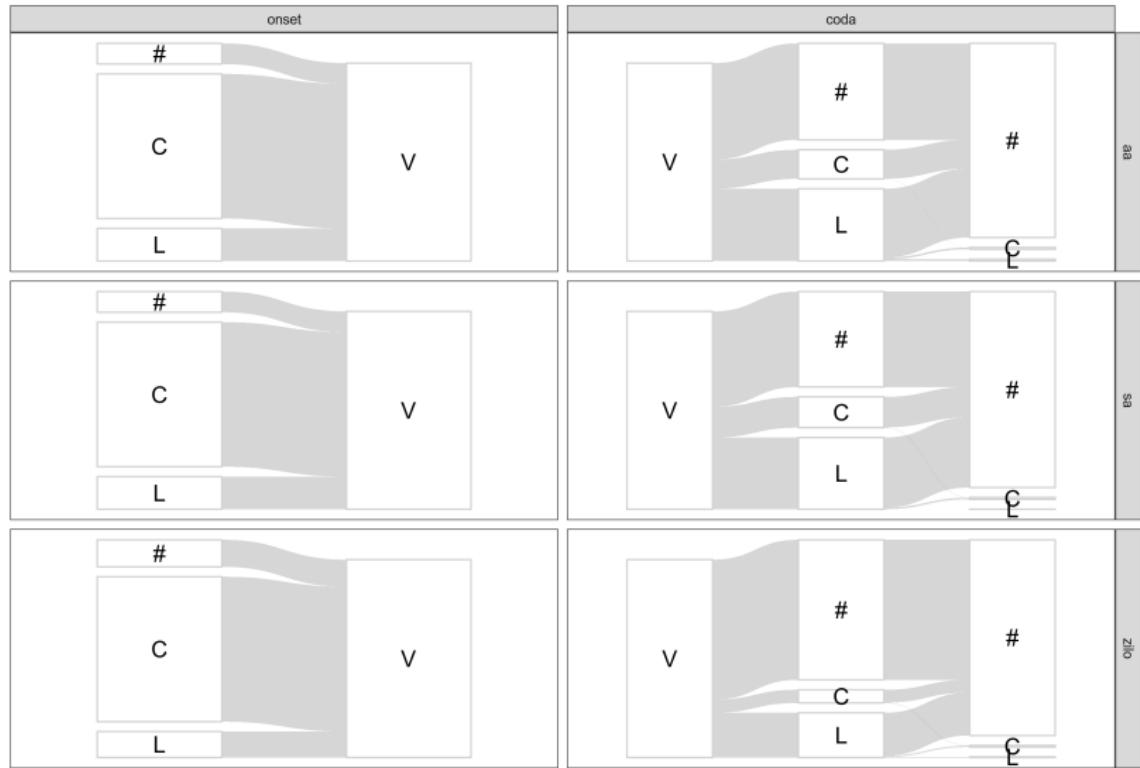


Phonology: data–driven analysis of syllables



- ▶ analyse all onsets of initial syllables in corpus
- ▶ analyse all codas of final syllables in corpus
- ▶ generalize obtained initials and codas into a syllable model
- ▶ check, whether this model describes all intervocal consonant clusters

Phonology: data–driven analysis of syllables



Nominal morphology

Two topics investigated:

- ▶ Formation of the plural
 - ▶ to check the productivity of different suffixes
- ▶ Formation of the genitive
 - ▶ to study alternations in the formation of oblique stems

Comparison of the two resources to look for possible variation in such areas of nominal morphology

(based on 1,072 pairs retrieved during the first annotation round)

Plural formation in Botlikh

- ▶ A suffix is attached to the absolute stem:
na 'thing' < *na-bati* 'things'
- ▶ With stems ending in a consonant, the vowel *-a-* is often inserted before the suffix:
majmalak 'monkey' < *majmalak-a-bati* 'monkeys'
- ▶ With stems ending in a vowel, alternation can occur:
ruša 'tree' < *ruši-bati* 'trees',
salu 'tooth' < *sala-bati* 'teeth',
burači 'pitcher' < *burača-bati* 'pitchers'

Plural formation in Botlikh

Among the most common suffixes are:

- ▶ *-baṭi* and allomorphs (*-maṭi* for stems ending in a nasal, *-wabaṭi* for stems ending in *-u*, etc.), the variant *-zabaṭi* (mostly with borrowings)
apicer ‘officer’ < *apicer-zabaṭi* ‘officers’
- ▶ *-de* (mostly for stems ending in a sonorant)
ambur ‘roof’ < *ambur-de* ‘roofs’
- ▶ *-e* and its variant *-we* (for stems ending in *-u*)
čan ‘deer’ < *čan-e* ‘deers’

Other, less common, suffixes are: *-(b)daṭi*, *-(b)diṭi*, *-(a)l*, *-rdi*, *-bala(l)*

Plural formation in Botlikh

Can our dictionary data help us be more precise about the distribution/frequency/productivity of plural suffixes in Botlikh?

...

Do the two dictionaries show any variation in these respects?

Plural suffixes in the dictionaries

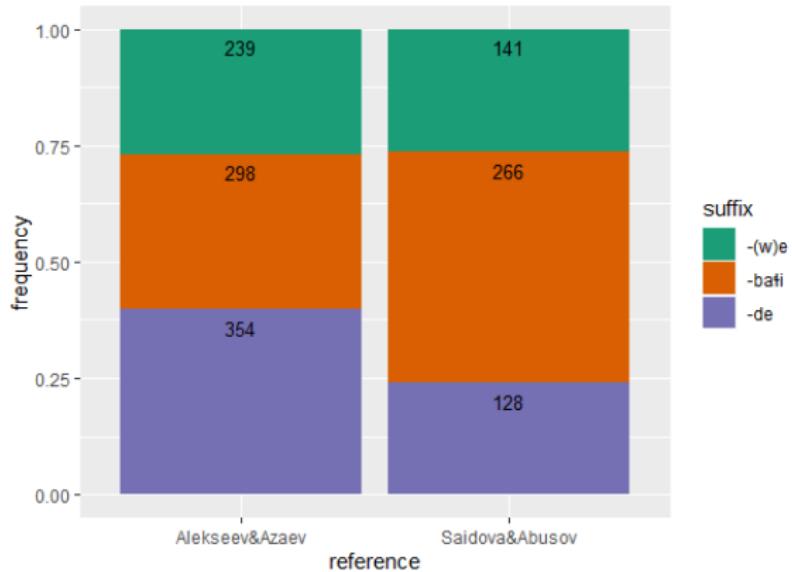
- ▶ Plural suffixes are not reported for all nouns, cf. *singularia tantum* and plural entries (nationalities, *pluralia tantum*)
- ▶ Quite often more than one variant is reported

Table 1: Plural suffixes in the dictionaries

	Saidova & Abusov (2012)	Alekseev & Azaev (2019)
<i>-(x)ati</i>	292	298
<i>-de</i>	128	354
<i>-(w)e</i>	141	239
other	24	21
no plural	499	193

Plural suffixes in the dictionaries

Figure 6: Plural suffixes in the dictionaries



$$(\chi^2 = 47.118, \text{df} = 2, \text{p-value} = 5.869e-11)$$

Plural suffixes in the dictionaries

- ▶ Preference for *-(x)batı* over *-de* in Saidova & Abusov (2012) vs. the opposite trend in Alekseev & Azaev (2019)
- ▶ The higher frequency of *-de* in Alekseev & Azaev (2019) is partly due to masdars
 - ▶ Saidova & Abusov (2012) almost never report the plural form for such nouns, whereas Alekseev & Azaev (2019) consistently report *-de*
- ▶ Variation often involves (but is not restricted to) borrowings
 - ▶ *birgadir* 'foreman' < *birgadir-zabatı* vs. *birgadir-de*
 - ▶ *kassir* 'cashier' < *kassir-zabatı* vs. *kassir-de*
- ▶ The frequent mentioning of more than one variant might suggest idiosyncratic variation

Case declension in Botlikh

Two declension types

- ▶ I type — the stem does not change when a suffix is attached (mostly stems ending in a vowel and masdars)
babu ‘mom’ < *babu-ti* (genitive)
masir ‘measurement’ < *masir-ti* (genitive)
- ▶ II type — case suffixes are attached to the oblique stem of the noun (mostly stems ending in a consonant, sometimes stems ending in a vowel)
askar ‘army’ < *askar-a-ti* (genitive)
din ‘religion’ < *din-i-ti* (genitive)
ima ‘father’ < *imu-ti* (genitive)

Case declension in Botlikh

Can our dictionary data help us be more precise about the patterns of case declension (oblique stem formation) and their frequencies?

...

Do the two dictionaries show any variation in these respects?

Oblique stem formation in the dictionaries

We used the grammatical information included in the dictionaries (genitive suffix) to investigate oblique stem formation in Botlikh

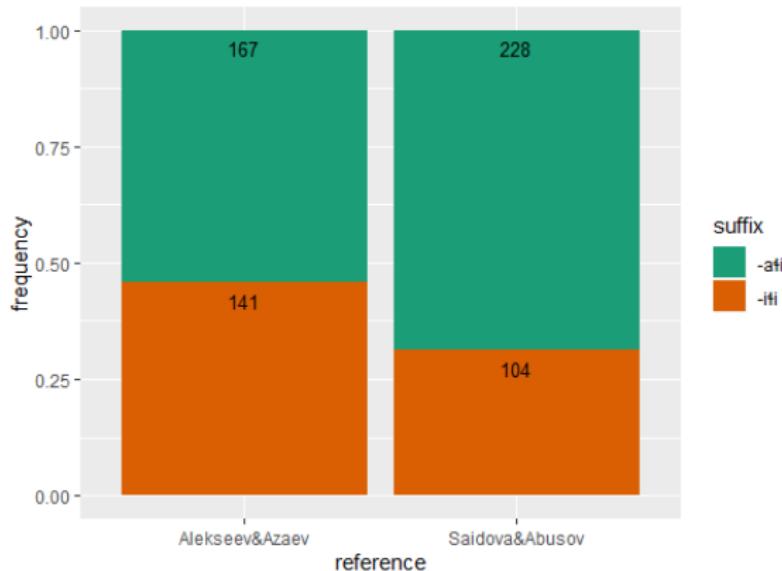
Table 2: Oblique stem formation in the dictionaries

	- <i>ti</i>		- <i>a-ti</i>		- <i>i-ti</i>		- <i>u-ti</i>	
consonant	232	266	228	167	104	141	-	1
- <i>a</i>	182	167	-	-	3	13	15	14
- <i>i</i>	143	151	10	4	-	-	3	2
- <i>u</i>	81	78	1	-	-	3	-	-
- <i>e</i>	6	6	-	-	-	-	-	-
- <i>o</i>	7	7	-	-	-	-	-	-

Saidova & Abusov (2012) vs. Alekseev & Azaev (2019)

Oblique stem formation in the dictionaries

Figure 7: Oblique stem formation for stems ending in a consonant



$$(\chi^2 = 13.523, \text{ df} = 1, \text{ p-value} = 0.0002357)$$

Oblique stem formation in the dictionaries

- ▶ Significant variation between the two dictionaries in the formation of oblique stems for nouns ending in a consonant
- ▶ This again involves (but is not restricted to) borrowings (a general preference for *-a-* over *-i-* in [Saidova & Abusov \(2012\)](#))
 - ▶ *dakument* 'document' < *dakument-a-ti* vs. *dakument-i-ti*
 - ▶ *kassir* 'cashier' < *kassir-a-ti* vs. *kassir-i-ti*
 - ▶ *adijal* 'blanket' < *adijal-a-ti* vs. *adijal-i-ti*
- ▶ Different variants for one and the same noun are reported far less frequently as compared to plural suffixes

Verbal morphology

Formation of present (habitualis) and past (aorist) forms of:

- ▶ Basic verbs (infinitive in *-i*)
- ▶ Derived verbs (infinitive in *-t̪i*)
- ▶ Causative verbs (infinitive in *-a-j*)

Comparison of the two resources to look for possible variation in such areas of verbal morphology
(based on 554 pairs retrieved during the first annotation round)

Basic verbs

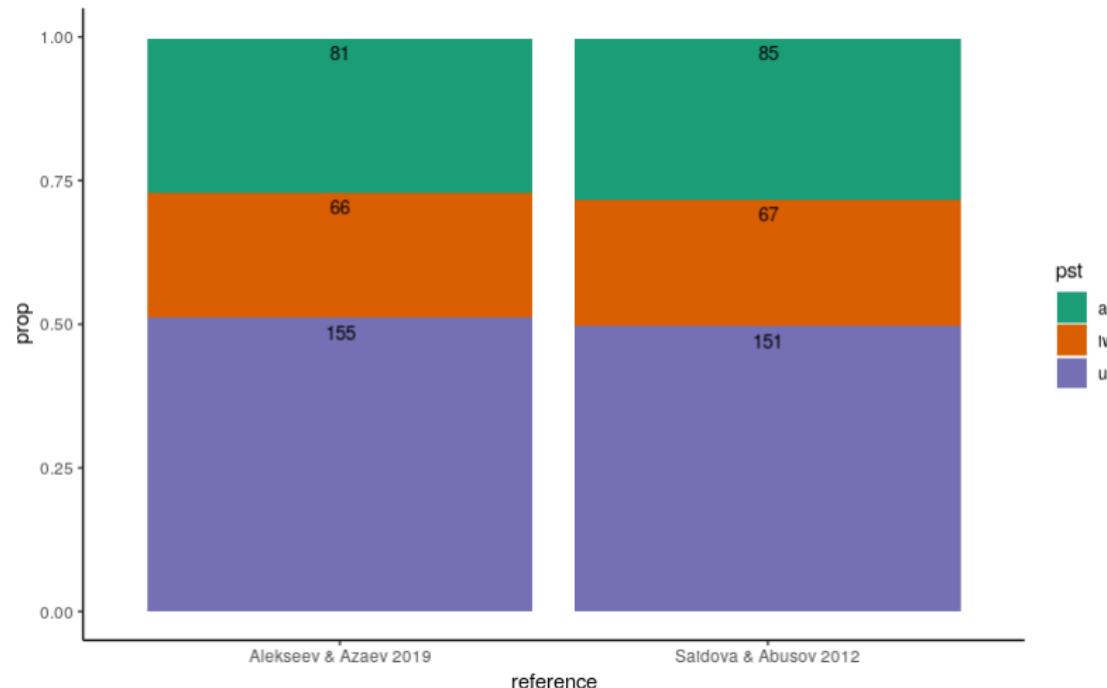
- ▶ Habitualis: *-e*
- ▶ Aorist: *-a* / *-u* / *-iw*

Table 3: Basic verbs: inflection

	Infinitive	Habitualis	Aorist
see	<i>haꝝ-i</i>	<i>haꝝ-e</i>	<i>haꝝ-a</i>
do	<i>ih-i</i>	<i>ih-e</i>	<i>ih-u</i>
be able	<i>baꝝar-i</i>	<i>baꝝar-e</i>	<i>baꝝar-iw</i>

Basic verbs

Figure 8: Aorist suffixes in the dictionaries



Derived verbs

Analytic formation of both the habitualis and the aorist with auxiliaries

- ▶ be: *b-uk'-e, b-uk'-a*
- ▶ become: *b-ah-e, b-ah-u*

Table 4: Derived verbs: inflection

	Infinitive	Habitualis	Aorist
roar	<i>buda-ti</i>	<i>buda b-uk'-e</i>	<i>buda b-uk'-a</i>
bleat	<i>baʃada-ti</i>	<i>baʃada b-ah-e</i>	<i>baʃada b-ah-u</i>

Causative verbs

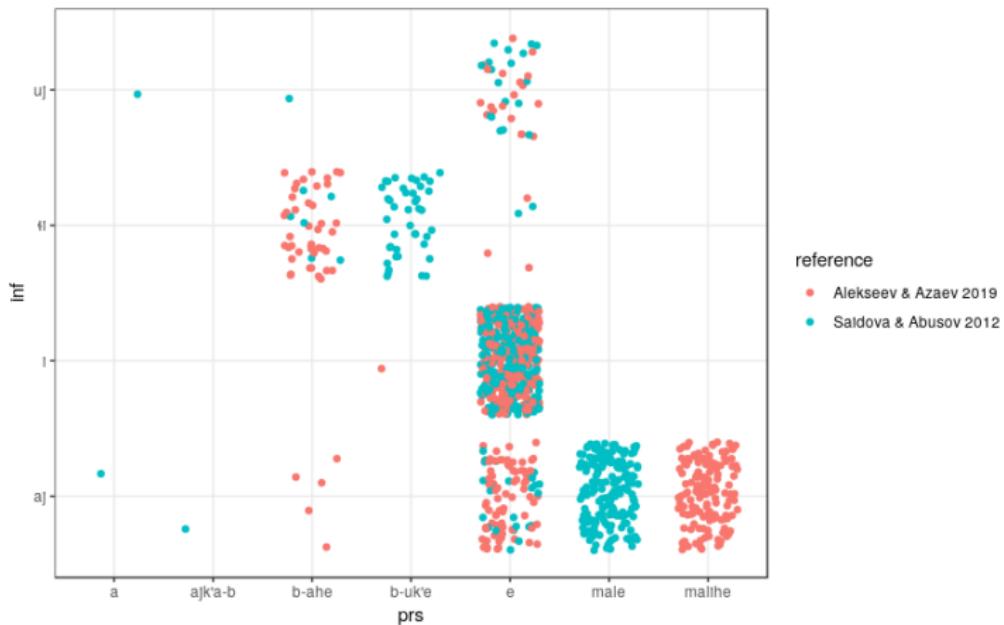
- ▶ $-o < *-a-u$ [-CAUS-AOR]
- ▶ $-mal-e$ a reduced form of $-malih-e$?
- ▶ $-mal-o$ rarely found in the data

Table 5: Causative verbs: inflection

	Infinitive	Habitualis	Aorist
resettle	<i>guč-a-j</i>	<i>guč-e</i>	<i>guč-o</i>
roast	<i>žad-a-j</i>	<i>žad-a-j-mal-e</i>	<i>žad-a-j-mal-o</i>
sew up	<i>mik'-a-j</i>	<i>mik'-a-j-mal-e</i>	<i>mik'-o</i>
sew up	<i>mik'-a-j</i>	<i>mik'-a-j-malih-e</i>	<i>mik'-a-j-malih-u</i>

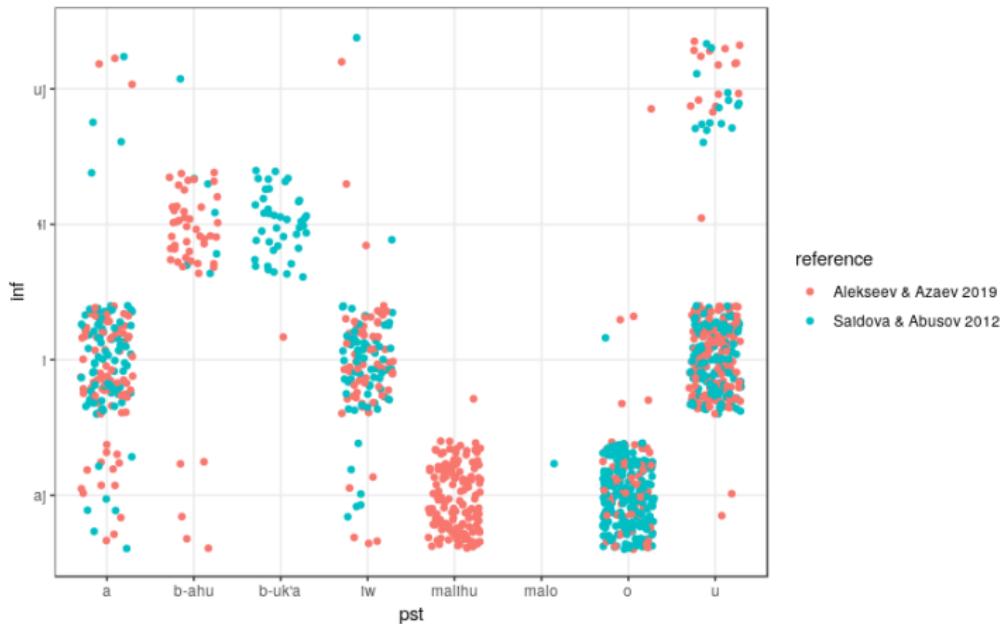
Habitualis in the dictionaries

Figure 9: Habitualis



Aorist in the dictionaries

Figure 10: Aorist



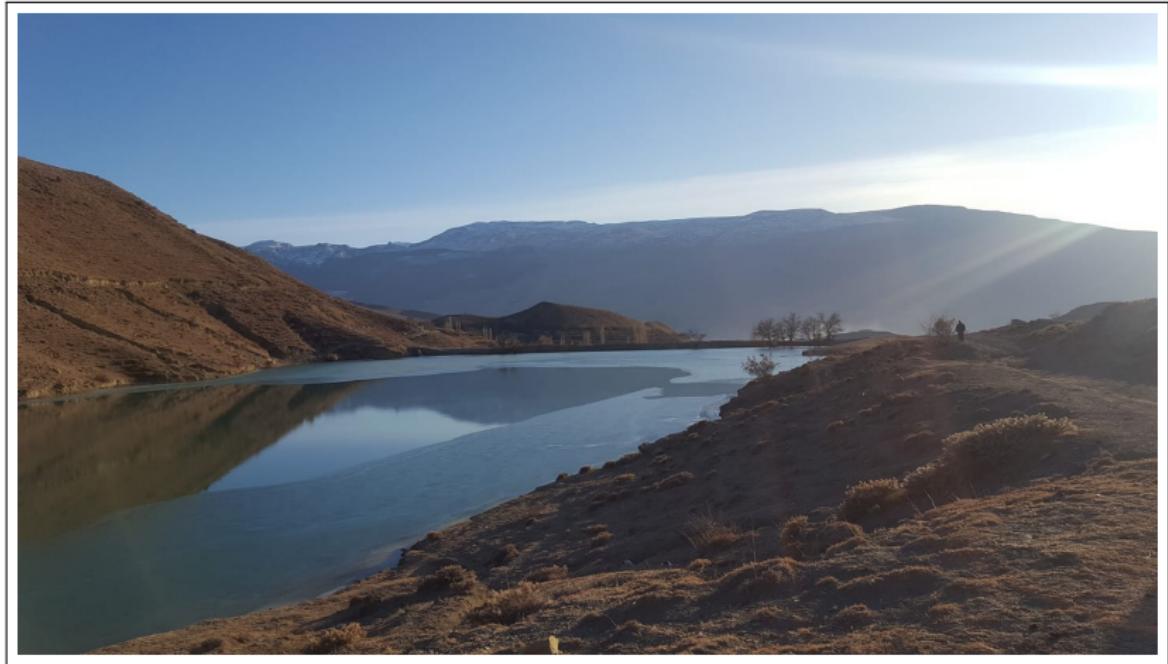
Variation

- ▶ Basic verbs display little variation in the aorist (and no variation at all in the habitualis)
- ▶ Most variation is observed for derived and causative verbs:
 - ▶ Derived verbs: preference for auxiliary 'be' in Saidova & Abusov (2012) vs. 'become' in Alekseev & Azaev (2019)
BUT it seems that this is just a matter of personal taste for citation forms: examples in the dictionary entries show that both variants are possible
 - ▶ Causative verbs: full (older?) forms *-malih-e* and *-malih-u* in Alekseev & Azaev (2019) vs. reduced form *-mal-e* and synthetic *-o* in Saidova & Abusov (2012)
This might be interpreted as diachronic variation, since the data in Alekseev & Azaev (2019) are older

Discussion

Methodological remarks

The end



The end

[github/agricolamz/2020.03.24_NIS_dictionaries](https://github.com/agricolamz/2020.03.24_NIS_dictionaries)

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Abbreviations

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