# Moksha glide epenthesis

Sasha Shikunova

EGG 2023; last updated July 19, 2023

## 1 Basic facts

Moksha < Mordvinic < Uralic, European part of Russia, Mordovia Republic and neighbouring regions

Vowel and consonant inventories (Kukhto 2018)

| | | |
|---|---|---|
| i | (ɨ) | u |
| e | (ə) ə | o |
| ɛ | a | |

| | | | | | | |
|---|---|---|---|---|---|---|
| m | | n<br>n’ | | | | |
| p b | | t d<br>t’ d’ | | | | k g |
| | f v | s z<br>s’ z’ | | š ž<br>šč | j̊ | (x) |
| | | c<br>c’ | | č | | |
| | | | | | j | |
| | | | r̥ r<br>r̥’ r’ | | | |
| | | l̥<br>l | l̥’<br>l’ | | | |

≫ Contrastive voicing in stops AND glides

≫ Contrastive palatalisation

≫ /x/ only in loanwords

## 2 Data

Sources of data: chapter on Moksha phonology by Kukhto (2018), chapter on Moksha morphophonology by Kozlov & Kozlov (2018), the Moksha corpus and online fieldwork. A practical transcription adopted from Toldova & Kholodilova (2018) is used throughout the paper; the IPA correspondence table is provided in the appendix.

≫ Glide insertion occurs after bases ending in /u/ or /i/ before vowel-initial suffixes (Kozlov & Kozlov 2018)

≫ No glide insertion after monosyllabic bases

≫ Different glide insertion rules before schwa- and /a/-initial suffixes (reduced vs full vowel)

Questions that we are going to answer:

≫ Is the syllable-counting rule reducible to something? In Strict CV phonology, flat and two-tiered, such rules are particularly difficult to implement.

≫ How do we model a distinction between reduced and full vowels wrt. glide insertion before them?

### 2.1 Schwa-initial suffixes

The glide epenthesis before schwa-initial suffixes inserts /v/ after /u/ (1) and /j/ after /i/ (4).[1] After consonant-final bases the suffixal schwa is retained (3, 6). There is no epenthesis after the unreduced vowels /a o e ɛ/ (2, 5).

(1) jožu + əl' → jožuv-əl'
'(3SG was) smart-IPF'

(2) ava + əl' → ava-l'
'(3SG was a) woman-IPF'

(3) ruz + əl' → ruzəl'
'(3SG was) Russian-IPF'

(4) t'ɛči + ən' → t'ɛčij-ən'
'today-GEN'

(5) ava + ən' → ava-n'
'woman-GEN'

(6) ruz + ən' → ruzən'
'Russian-GEN'

As already mentioned, no epenthesis happens with monosyllabic bases, verbal or nominal (7–9).

(7) ši + ən' → ši-n'
'day-GEN'

(8) mu + əms → mu-ms
'find-INF'

(9) vi + əms → vi-ms
'bring-INF'

The behaviour of glides in between /u i/ and suffixal schwa is summarised in Table 1 below. A# corresponds to the unreduced vowels /a o e ɛ/.

| | C# | A# | u# | i# |
|---|---|---|---|---|
| monosyllabic | ən' | n' | n' | n' |
| polysyllabic | | | vən' | jən' |

Table 1: Suffix *ən'* 'GEN' with different kinds of bases

[1] The part of the gloss in parentheses is not a part of the actual translation and serves to indicate that these forms are used as nominal predicates. The epenthetic /v/ and /j/ will be referred to as glides for the sake of simplicity, despite /v/ not being a glide.

It is important to note that the glide insertion is not synchronically productive, that is, it does not affect loanwords. The default strategy is to treat /u i/ exactly like other vowels: to drop the schwa altogether (10–12). The syllable count is of no importance with loanwords.

(10) žuri + ən' → žuri-n'
'jury-GEN'

(11) soči + ən' → soči-n'
'Sochi-GEN'

(12) li + ən' → li-n'
'Li-GEN'

Epenthesis of glides is not restricted to schwa-initial suffixes, but behaves differently with the /a/-initial ones. Since there are no suffixes in the Moksha language that strart with /o ɛ e/, no other unreduced vowels can be investigated in the suffix-initial position.

## 2.2 /a/-initial suffixes

Suffixes that begin with /a/ cause glide epenthesis when attached to /u i/-final bases, as exemplifies in (13–14). Those are agreement markers *-an* '1SG' and *-at* '2SG' that can mark both verbal and nominal predicates (Kholodilova 2018, Toldova 2018).

(13) jožu + an → jožuvan
'(I am) smart-1SG'

(14) vidi + an → vidijan
'(I am) a sower-1SG'

The peculiar property of the /a/-initial suffixes is that in monosyllabic bases ending in /u i/, no matter which vowel it is, /j/ is inserted at all times (15–16).

(15) mu + an → mujan
'(I) find-1SG'

(16) li + an → lijan
'(I) fly-1SG'

Final /a ɛ/ coalesce with the suffix's vowel; as for the rest of the unreduced vowels – /e o/ – Kozlov & Kozlov (2018) do not specify, only describing the phenomenon of 'a-coalescence' with /a/ and /ɛ/ in base-final positions (17–18).

(17) jaka + at → jakat
'(you) go-2SG'

(18) at'ɛ + an → at'an
'(I am) an old man-1SG'

Monosyllabic bases are different here again – in single-syllable bases ending with /a/, no a-coalescence occurs and /j/ is inserted (19–20).

(19) sa + an → sajan
'(I) come-1SG'

(20) šna + an → šnajan
'(I) praise-1SG'

The pattern is summarised in Table 2.

| | C# | A# | u# | i# |
|---|---|---|---|---|
| monosyllabic | an | jan | jan | jan |
| polysyllabic | | n | van | |

Table 2: Suffix *an* 'NPST.1SG' with different kinds of bases

### 2.3 Suffixes starting with /u i/

There is one more phenomenon that is relevant to the glide insertion problem. Those are several suffixes in Moksha that start with a high vowel or consist of /u i/ alone, for instance, *-i/j* 'NPST.3SG' and *-u/v/i* 'LAT' (Kozlov & Kozlov 2018). As evident from my exposition of these morphemes, they alternate between the vowel and the glide, the lative case marker having an additional variant that appears after palatalised consonants. The distribution of these variants is similar: the glide comes after vowels, the vowel – after consonants; see (21–23) for the 3SG agreement marker and (24–25) for the lative.

(21) jaka-j 'go-3SG'

(22) šam-i 'empty-3SG'

(23) magazin-u
'shop-LAT'

(24) vir'-i
'forest-LAT'

(25) lavka-v
'shop-LAT'

The examples in (21–25) show that it is not out of the ordinary for /u i/ in Moksha to alternate with the corresponding glides. The glide insertion is not the only process where these alternations are observable, hence an analysis that can handle the /u i/-suffixes pattern on par with the glide insertion is preferable.

### 2.4 Stress in Moksha

This section describes the stress pattern in Moksha, which is only at first glance unrelated to the glide insertion. However, as will be shown later, it likely is of great importance.

The Moksha stress is conditioned by vowel quality (Kukhto 2018). Syllables can be divided into *heavy* (featuring /a ɛ e o/ as nuclei) and *light* (featuring /u i ə/). The stress is borne by the leftmost heavy syllable (26–27), or, in words without heavy syllables, by the leftmost light one (28).[2]

(26) 't'ɛd'ɛ
'mother'

(27) ku'vaka
'long'

(28) 'kijə
'who'

Apart from schwa, the light vowels are precisely those that trigger glide insertion base-finally, unless the word is monosyllabic. In other words, what triggers glide insertion are base-final unstressed light vowels. I will now demonstrate where this generalisation can go, assuming that 'heaviness' and 'lightness' of syllables, as well as stress, are underlyingly vowel length.

## 3 Glide epenthesis is conditioned by stress

The gist of my proposal:

≫ Heavy vowels /a o ɛ e/ and the stressed light vowels /u i ə/ are long; in Strict CV terms, they are associated to two CV slots

≫ The stress falls on the leftmost long vowel, and where there are no long vowels, an empty CV is inserted to the right of the leftmost vowel so that it is lengthened

[2] I will continue to refer to the vowels that constitute the nuclei of heavy and light syllables heavy and light respectively.

≫ Therefore base-final /a o ɛ e/ and final /u i ə/ in monosyllabic bases form a natural class: they end in a long vowel

(29) [ku'vaka]

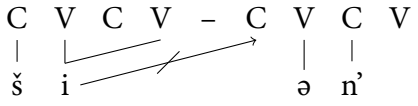

(30) ['kijə]


≫ The glide insertion is the result of /u i/ spreading onto the initial C of the suffix

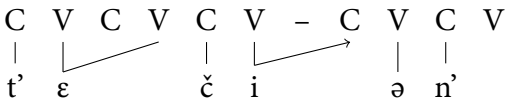
≫ Long vowels do not spread

≫ The restriction on triple association, or extra-long segments, is widely attested and may be universal (Chekayri & Scheer 2004, Enguehard 2018)

(31) ši + ən' → [ši-n']




(32) t'ɛči + ən' → [t'ɛčij-ən']



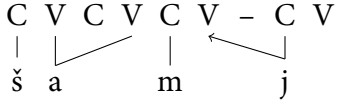

The schwa disappears after long vowels and stays after consonants, be it base-final consonants or glides that appear after spreading. I suggest that schwa is deleted rather via coalescence with the long vowel than as a result of some vowel-zero alternation, because, should there be a vowel-zero alternation, we would expect the schwa to disappear after C# as well.

I now turn to two other previously described phenomena: (a) the vowel-glide alternation in /u i/-suffixes; (b) /j/-insertion in between monosyllabic bases with a heavy syllable and an /a/-initial suffix.

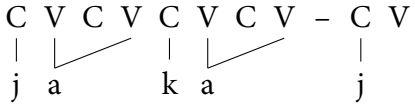
## 3.1 /u i/-suffixes are consonants

I argue that a similar analysis based on of /u i/ associating to two slots (C and V) can be pursued for the /u i/-initial suffixes, albeit with a change in representations: the /u i/ of these suffixes are better conceived of as underlying consonants. They surface as vowels when there is a base-final empty V to associate to (33) and as consonants, if the V is taken (34).

(33) [šam-i]




(34) [jaka-j]




This claim is motivated by the fact that in Strict CV, the universal syllable structure is CV, that is, every syllabic unit ends in a V-slot, empty or filled. Suppose the initial /u i/ of some suffix is a genuine vowel. If it is floating, it would only surface after consonants, which is not true to the data. With the vowel associated, the analysis gets in conflict with the behaviour of another alternating suffix *u/əv* 'PASS', which occurs as *-(ə)v* before and/or after vowels (35–36) and is in free variation between *-u* and *-əv* in between consonants (37).

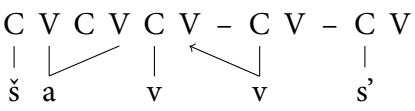
(35) sa-v-an
'come-PASS-NPST.1SG'

(36) uč-əv-ə
'wait-PASS-CN'

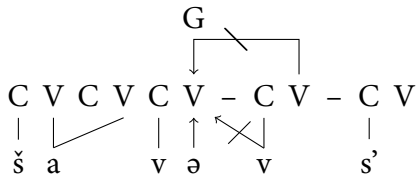
(37) šav-əv-s' ∼ šav-u-s'
'kill-PASS-PST.3SG'

Should its underlying representation be *-u*, its shapeshifting in the presence of vowels would require reassociating it to a C-slot so as to free up a V-slot for the next vowel to associate to. With the suffix as a consonant, on the other hand, the analysis is more elegant and capable of capturing the variation between *-u* and *-əv* in between consonants: either there is association to the free base-final V (38) or not (39).[3]

(38) [šav-u-s']




(39) [šav-əv-s']




Such are the /u i/-initial suffixes: while alternating between vowels and glides like the bases that are subject to glide insertion, the latter diverge from the former in their underlying representation: glide insertion happens to base-final vowels (/u i/), but the vowel-glide alternation happens to suffix-initial consonants (/v j/). One may wonder whether glides are really absent from the representations of the bases subject to glide epenthesis, from which comes a possible objection to my account of this phenomenon.

## 3.2 Are glides floating segments?

Arguments in favour of representing glides as floating segments:

≫ Glide insertion is not synchronically productive: it never happens in loanwords, no matter their syllable count or stress pattern

≫ The glides that appear in glide insertion are historically recoverable (Bubrikh 1953: pp. 11–12)

≫ There is a native Moksha exception to the rule – *ksti* 'berry', which does cause glide insertion in spite of being monosyllabic (Kozlov & Kozlov 2018: p. 42)

(40) žu'ri + ən' → žuri-n'
'jury-GEN'

(41) 'soči + ən' → soči-n'
'Sochi-GEN'

(42) li + ən' → li-n'
'Li-GEN'

Finally, the rule that determines stress placement is not productive either on relatively fresh loanwords – see the examples of Russian loanwords in (43–44), which do not obey the law of stressing the leftmost heavy syllable.

(43) 'kruška 'cup'

(44) 'kniga 'book'

The analysis that links stress and glide epenthesis is therefore not incoherent: both rules are not extendable to loanwords, so the link between them is plausible. At the moment in the history of

[3] I leave the exact Government-based mechanism of schwa insertion to future research, however, it can be noted that final empty nuclei are able to govern, since there are numerous examples of word-final clusters (for instance, *satfks* 'success', *lifkst* 'smallpox').

Moksha when both of them were productive, the connection that I have established might well have held.

## 3.3 Monosyllabic bases – always with glides?

(45) sa + an → sajan
'come-1SG'
(Kozlov & Kozlov 2018: p. 57)

(46) šna + an → šnajan
'praise-1SG'

(47) mu + an → mujan
'find-1SG'

(48) li + an → lijan
'fly-1SG'

The /j/ inserted in between heavy vowels has nothing to do with stress. Final light vowels can only be long in monosyllabic bases with suffixes containing no heavy vowels – this is the only context where they can be stressed and therefore lengthened. Heavy vowels like /a/, on the other hand, can absolutely be base-final and stressed if there are no other heavy vowels to their left. Consider the example of such base, which is polysyllabic and contains a final stressed heavy vowel (49). No /j/-insertion occurs before *-an*.

(49) juma + an → juman
'(I am) lost-1SG'

(50) šta + an → štajan
'wash-1SG'

(51) šta + s' → štas'
'wash-PST.3SG'

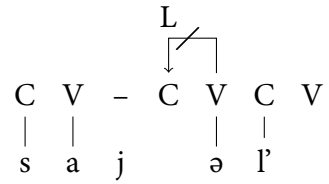
(52) iz' sa
'NEG.PST.3SG come.CN'

(53) sa + əl' → sal'
'come-IPF'

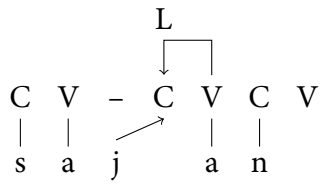
Therefore, the /j/-insertion in monosyllabic /a/-final bases can be analysed as an effect of a floating segment without detriment to any generalisations already posited. The glide only surfaces before unreduced vowels (50) and is deleted before consonants (51) and at the right edge (52). Its interaction with schwa-initial suffixes is puzzling, because both the schwa and the floating glide are deleted (53).

Since there is no option of making schwa floating as well, which would render spreading of /u i/ before schwa-initial suffixes impossible, we have to restrict the floating glide's ability to associate: it can only associate to a licensed position. Schwa cannot licence the preceding C-slot (54), whereas /a/ can (55).

(54) sa + əl' [sa-l']




(55) sa + an [sa-jan]




≫ In /u i/-final monosyllabic bases, /j/ is inserted before /a/ but nothing is inserted before schwa

≫ /u i/-final monosyllabic bases act exactly like the /a/-final ones

≫ They may have the same floating glide that associates before full vowels (in licensed positions)

≫ The glide, however, cannot associate before schwa: recall that it is lost in *sa<j> + əl' → sal'*

≫ We still need an explanation of why /u i/ can't spread in monosyllabics

# Appendix

## IPA correspondence table

| IPA | Transcription |
|---|---|
| m | m |
| n̪ | n |
| n̪ʲ | n' |
| p | p |
| b | b |
| t̪ | t |
| t̪ʲ | t' |
| d̪ | d |
| d̪ʲ | d' |
| k | k |
| g | g |
| x | x |
| f (ɸ) | f |

| IPA | Transcription |
|---|---|
| v (β) | v |
| s̪ | s |
| s̪ʲ | s' |
| z̪ | z |
| z̪ʲ | z' |
| ʃ | š |
| ʃː (ʃt͡ʃ) | šč |
| ʒ | ž |
| t͡s̪ | c |
| t͡s̪ʲ | c' |
| t͡ʃ | č |
| ç | j̊ |
| j | j |
| ɾ̥ | r̥ |

| IPA | Transcription |
|---|---|
| ɾ̥ʲ | r̥' |
| ɾ | r |
| ɾʲ | r' |
| ɬ̪ | l̥ |
| ɬ̪ʲ | l̥' |
| l̪ | l |
| l̪ʲ | l' |
| i | i |
| u | u |
| e | e |
| ə | ə |
| o | o |
| ɛ | ɛ |
| a | a |

## List of glossing abbreviations

**1** first person
**2** second person
**3** third person
**CN** connegative
**GEN** genitive
**INF** infinitive
**IPF** imperfective
**LAT** lative case
**NEG** negative
**NPST** non-past
**PASS** passive
**PST** past
**SG** singular

# References


Bubrikh, Dmitrij. 1953. *Istoričeskaja grammatika èrzjanskogo jazyka [Historical grammar of the erzya language]*. Saransk: Mordovskoe knižnoe izdatel'stvo.

Chekayri, Abdellah & Tobias Scheer. 2004. The appearance of glides in Classical Arabic defective verbs. *Folia Orientalia* (40). 7–33.

Enguehard, Guillaume. 2018. Strict CV without government. *Acta Linguistica Academica* 65(1). 29–45.

Kholodilova, Maria. 2018. Imennaja predikacija [Nominal predication]. In Svetlana Toldova & Maria Kholodilova (eds.), *Èlementy mokšanskogo jazyka v tipologičeskom osveščenii [Elements of the Moksha language in a typological perspective]*, chap. 23, 616–632. Moscow: Buki Vedi.

Kozlov, Alexei & Lev Kozlov. 2018. Morfonologija [Morphophonology]. In Svetlana Toldova & Maria Kholodilova (eds.), *Èlementy mokšanskogo jazyka v tipologičeskom osveščenii [Elements of the Moksha language in a typological perspective]*, chap. 4, 38–62. Buki Vedi.

Kukhto, Anton. 2018. Fonologija [Phonology]. In Svetlana Toldova & Maria Kholodilova (eds.), *Èlementy mokšanskogo jazyka v tipologičeskom osveščenii [Elements of the Moksha language in a typological perspective]*, chap. 3, 19–37. Moscow: Buki Vedi.

Toldova, Svetlana. 2018. Predikacii s glagol′nym skazuemym [Clauses with verbal predicates]. In Svetlana Toldova & Maria Kholodilova (eds.), *Èlementy mokšanskogo jazyka v tipologičeskom osveščenii [Elements of the Moksha language in a typological perspective]*, chap. 22, 546–615. Moscow: Buki Vedi.

Toldova, Svetlana & Maria Kholodilova (eds.). 2018. *Èlementy mokšanskogo jazyka v tipologičeskom osveščenii [Elements of the Moksha language in a typological perspective]*. Moscow: Buki Vedi.