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An unidentified marginal phoneme: The analysis of Udmurt [w]

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ABSTRACT

In Standard Udmurt, [w] occurs only in about 50 stems, always following stem-initial [k] and preceding [ɑ] as in the word [kwɑc] '6', with one exception, [kwiɲ] '3', in which it is followed by [i]. Some grammars analyse [w] as a realisation of the approximant /w/, while others analyse it as an initial part of a diphthong (/u̯ɑ/ and /u̯i/). Other possible analyses, such as the assumption of a labialised velar stop /k^{w}/ or the analysis of [w] as an allophone of an already supposed phoneme do not appear in the literature. This paper observes the pros and cons of the different analyses, including data from and observations about the dialects. It concludes that the segment [w] belongs to a phoneme which is marginal, but it remains unclear to what phoneme it belongs.

KEYWORDS

Udmurt, marginal phonemes, voiced labiovelar approximant, semivowel, glide, diphthong, labialised stop, syllable structure

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1. INTRODUCTION

In Standard Udmurt, an approximant [w][1] occurs only in about 50 stems. It always follows a stem-initial [k] and it is almost always followed by [ɑ], see Table 1 for examples.[2] Word-internally, the pattern occurs only in compounds, at the beginning of the second constituent: [ɑʑtemkwɑkɑ] 'European nightjar' ([ɑʑtem] 'lazy' + [kwɑkɑ] 'carrion crow'), [bɑɟkwɑr] 'common bleak' ([bɑɟ] 'willow' + [kwɑr] 'leaf'), [bɑkɑkwɑr] 'marsh marigold, kingcup; buttercup, spearwort, water crowfoot; dial. coltsfoot' ([bɑkɑ] 'frog' + [kwɑr] 'leaf'), [vukwɑr] 'coltsfoot; marsh marigold, kingcup' ([vu] 'water' + [kwɑr] 'leaf'), [gidkwɑ] 'courtyard, farmyard' ([gid] 'stable, shed, pigsty, sheep fold' + [kwɑ] (archaic) 'house, cultic building, summer kitchen'), [inkwɑʑ] 'nature; climate' ([in] 'sky' + [kwɑʑ] 'weather'), [kunokwɑ] 'tenement; hotel' (neologism, [kuno] 'guest' + [kwɑ] (archaic) 'house, cultic building, summer kitchen') etc. There is only one exception, [kwiɲ] '3', in which stem-initial [kw] is followed by [i].

Theoretically, the sound [w] might be a realisation of an already supposed phoneme as well. Nonetheless, this possibility is not mentioned in the literature. There are several reasons for the lack of such analyses, but the most important might be that the relevant sources do not apply theories distinguishing underlying and surface representations. Another important factor is that [w] does not take part in any (morpho)phonological alternation, which would suggest an allophonic analysis.

Some of the descriptions analyse [w] as the realisation of the approximant (semivowel, glide) /w/, that is, as a segment belonging to the consonant system; and, consequently, [kw] is analysed as a consonant cluster /kw/ (cf. Csúcs 1990, 24; Csúcs 1998, 279; Csúcs 2005, 111; Kel'makov 1998, 79, 84; Bartens 2000, 51–52 etc.). All these descriptions also address the question of the distribution of /w/ in various dialects (see below). However, the presentation of the facts is not consistent. E.g. Csúcs (1990, 24) states that /w/ occurs only in some dialects, while Csúcs (1998, 279) claims that /w/ following stem-initial /k/ "is characteristic of the entire language", which may mean that the stem-initial cluster /kw/ occurs in all the dialects.[3] The table of the consonant system in Csúcs (1990, 24) does not contain /w/, and it is neither represented among consonants without palatalised and voiceless correspondents nor in the frequency order of the consonants. On the contrary, /w/ appears in the table of the consonant system in Csúcs (1998, 279), although in parentheses. Meanwhile, it is missing from the list of the consonants remaining outside of both palatalisation and voicing correlations Csúcs (1998, 280). This suggests that Csúcs does not consider /w/ a consonant of full value.

The same phenomenon is also described in another way by other sources. According to this second approach (cf. Tarakanov 1964, 75; Winkler 2001, 8–10; Edygarova 2022, 509; Suihkonen 2023, 578), [wɑ] is analysed as the diphthong /u̯ɑ/ (in the case of '3', [wi] is analysed as /u̯i/).

[1]Throughout this paper, IPA is used. All data taken from other sources using various transcriptions are transcribed to IPA. The labial articulatory gesture is transcribed as [w], while the phonemic transcription corresponds to the phonological analysis.

[2]Although many examples are clearly of onomatopoeic origin, the pattern also occurs in words that are definitely not. Historically, it seems that the pattern emerged in neutral words, but its rarity made it suitable for forming onomatopoeic items.

[3]Although /kw/ really appears in the overwhelming majority of the dialects, it changed into /kv/ e.g. in the Lower Cheptsa dialect (Kel'makov 1998, 85, 169).

Table 1. Words beginning with [kwɑ-] in Standard Udmurt

kwɑberkɑ	pantry in the kwɑłɑ
kwɑdɑ-	to strip, to peel (tr.); to wilt, to rot (intr.)
kwɑj-	to gain weight, to fatten
kwɑjeç	farmstead, estate (neologism)
kwɑk[1]	bush, shrub
kwɑk[2]	oakum
kwɑkɑ	carrion crow
kwɑkket-	to croak
kwɑł-kwɑł	plentifully, abundantly, copiously
kwɑłɑ	domestic cultic bulding; summer kitchen
kwɑłd-	to break, to crack, to rip, to tear (intr.)
kwɑłtɨrt-	to crackle, to rasp (intr.)
kwɑʌeg	shy, timid, panicky, unnerved
kwɑʌɑ-	to tremble with fear
kwɑʌɑʌuʌɨ	snail, slug
kwɑʌɑc͡çɑ	1. rash, heedless 2. panicmonger, fearmonger 3. rattle (Rhinanthus)
kwɑʌem ~ kwɑʌɨm	bivalve, cockle, mussel, shell
kwɑʌkket-	to wolf, to gobble
kwɑʌtɨrɨ ~ kwɑʌtɑturin	rattle (Rinanthus) (turɨn ‘grass, hay’)
kwɑʌtres	vulgar, rude
kwɑmɨn	30
kwɑn-	1. be enthusiastic, be obsessed 2. to have a wish granted
kwɑɲer	poor
kwɑɲok ~ kwɑɲgi	common buzzard
kwɑpəçkɨ	barn swallow
kwɑr	leaf
kwɑrɑ	sound, voice
kwɑrçɑ-	wither, dry up
kwɑs	ski
kwɑsɑ-	to bend, to crook (tr.)
kwɑʃet-	to clamour, to make noise

(continued)

Table 1. Continued

kwaʃka-	to collapse, to crumble, to fall
kwaɕ ~ kwaɕeg	shallow, flat
kwaɕi	drake (male duck)
kwataʌi ~ kwatargi	rash, heedless
kwataɕk-	get angry, get mad
kwa͡tʃam	fieldfare
kwa͡ɕ͡ɕirja-	to beat, to cane, to drive (a horse)
kwac	6
kwac-kwac	quail
kwaʒgat-	to destroy, to demolish
kwaʒɨ	corncrake
kwaʒɨm	cartilage, gristle
kwaʒɨr	crackle, rasp (onomatopoeic adverb)
kwaʑ	weather

Although these sources never include the alleged diphthongs in the table of vowels, this is likely the result of the description method (which only includes simple vowels), rather than the analysis. It should be noted that these descriptions are not based on well-developed, sufficiently elaborated phonological theories. Nonetheless, the statement that Udmurt has diphthongal phonemes must be interpreted in a way that the two vocalic elements are linked to the same nucleus underlyingly.

Interestingly, the two types of analysis interfere with each other. Suihkonen (2023, 51) (referring to Itkonen 1953, 282–284 and Rédei 1988, 352) considers it possible that the approximant /w/ developed by diphthongisation of rounded vowels. As in some Udmurt dialects (and many times also in Komi) [w] developed into [v], it is logical to assume that /v/ developed from /w/, which developed from the initial element of a diphthong. However, it remains unclear what the criteria are to distinguish the initial part of the diphthong from the approximant. Winkler (2001, 8), who analyses [w] as belonging to the diphthong /u̯a/, expressly claims that "u is pronounced as a bilabial semivowel" – however, it remains unclear why it should not be analysed as an approximant if it is pronounced so. Additionally, it remains obscure how the two cases could be differentiated on phonetic grounds. It is worth highlighting that there is no known phonetic research of the phenomenon; consequently, everything claimed about the pronunciation is based on the impressions of the various researchers (including native speakers).

There is also an additional possible analysis: the supposition of a labialised velar plosive /k^w/. Strangely enough, it is not mentioned in the literature, with the exception of Antal (2020, 10), who includes /k^w/ in the table demonstrating the consonant system. However, later he refers to the same phenomenon as a cluster (Antal 2020, 12). The lack of such an analysis is particularly

surprising given that such an analysis is generally accepted for a similar sequence in the distantly related and areally close[4] Northern Mansi (at least the Sygva and Sosva dialects, cf. e.g. Kálmán 1976, 22–23 or Riese 2001, 14): /k^{w}/ occurs stem-initially only preceding /ɑ:/. The distribution of [kw] in Mansi is wider; it also occurs word-finally. This is a good argument to analyse it as a labialised stop, as the cluster /kw/ would be a very ill-formed coda. Additionally, in the absence of a following vocalic element, [w] cannot be analysed as a part of a diphthong. Although there are no such strong arguments in the case of Udmurt, there is nothing that could exclude this analysis.

The three cases (independent approximant, diphthong and labialised stop) cannot be distinguished phonetically: in all three cases, following the stop's release, F1 is expected to be low and then rise quickly and steadily until it reaches the typical value for [ɑ]. (In the case of '3', a similar process is also expected with F2 until it reaches the value typical for [i]). If more phonemic structures are assumed, the formant transition is expected to be steeper in the case of the labialised stop than in the case of the approximant; while in the case of the diphthong, it might be even more prolonged. When there are no contrasted phonemic structures, phonetic data are insufficient for the identification of the phonemic background. In order to determine which analysis is the proper one, only phonological arguments have to be presented. However, due to the restricted environments in which these segments can occur, no strong arguments can support any of these analyses. However, using Occam's razor, an order of preference for the possible analyses can be presented.

The methodology is quite simple: the "cheapest" analysis is always preferred. The baseline is established by excluding forms that contain [w] from the analysis. Every segment or structural property which has to be added to the system in order to analyse forms containing [w] is considered to be the "price" of the analysis. The higher this price is, the less economically efficient the given solution is. The most economic analysis is preferred. However, it is not easy to compare the introduction of new elements on different levels of structure, e.g. the introduction of a new segment and the introduction of a new property in the syllable structure. Therefore, the total price cannot be calculated, although in most cases, the prices of the two analyses can be compared.

As it has been mentioned above, [w] has a wider distribution in some dialects. Certain dialects also have [w] in about 30 stems stem-initially (Kel'makov 1998, 83–84), but always preceding [ɑ], e.g. [wɑŋ] (Standard [vɑŋ]) 'be:PRS:3SG'. Additionally, there are dialects in which [ɬ] developed into [w] in coda and intervocalic positions.[5] (Cf. Tarakanov 1964; Csúcs 1990, 24; Csúcs 1998, 279; Kel'makov 1998, 83–86, 97–99; Bartens 2000, 51–52 etc.) For simplicity and unambiguity, coda and intervocalic [w]s will be referred to as *postvocalic* [w]s. Similar elements can be analysed differently in different systems, including different dialects of a language. Nonetheless, a uniform analysis is desirable: if two different kinds of analysis are equally

[4]Although Udmurt and Mansi have not contacted each other in recent centuries, they might have contacted earlier on the European side of the Urals.

[5]According to Tarakanov (1964, 80), the intervocalic sound is different from the others: it sounds like the English "bilabial" *w* (his example is *wen*) [sic], otherwise it sounds as a non-syllabic [u]. However, this sound is longer following a vowel than preceding it. On the contrary, Kel'makov (1998, 98) states that intervocalic [w] differs only in some central subdialects, and it is "less labialised" there. These phonetic differences, if they exist at all, do not seem to play any role in the phonemic analysis.

appropriate for one dialect but one of them is more appropriate for another dialect, it is reasonable to choose the analysis fitting both dialects rather than to choose two different analyses for the different dialects. However, it is conceivable that various dialects need different analyses, two or more of which would apply equally well to certain other dialect. In any case, when analysing a variant of a language, it is always worth taking other variants into consideration. In this paper, dialects with all kinds of distribution of [w] will be considered.

Irrespective of whether a phoneme /w/, /u̯ɑ/ (and /u̯i/) or /kʷ/ is supposed, both their rarity and the fact that they occur in a restricted phonemic environment are reasons for classifying them as marginal phonemes. This situation is unusual. In general, the problem of marginal morphemes emerges when a certain phoneme has to be analysed in a restricted set of environments, but it is straightforward what phoneme it is. In the case of Udmurt, the phonological analysis of a rare phonetic pattern is ambiguous.

This study compares the possible analyses for the Udmurt [w] across dialects, observing the "price" and the theoretical implications of each analysis. Section 2 analyses language variants in which [w] occurs only following a stem-initial [k]. Section 3 discusses the dialects in which [w] also occurs stem-initially. Section 4 examines the dialects in which postvocalic [ɬ] has developed into [w]. Section 5 considers what the historical changes can say about the analyses of [w]. Section 6 summarises the results.

2. THE ANALYSIS OF [W] FOLLOWING STEM-INITIAL [K]

Before examining what new phoneme should be introduced into the phoneme system for the analysis of the word-initial [kw], and if so, what phoneme it should be, it should be considered whether an analysis based on the phonemes supposed up to this point is possible.

The most obvious assumption is that [w] is an allophone of /u/: it appears when /u/ gets desyllabified before vowels. However, as the different forms of the verb /ku-/ 'weave' show, this is not the case: /ku-ɨnɨ/ [ku.ɨ.nɨ] 'weave-INF', /ku-e/ [ku.e] 'weave-PRS.3SG', /ku-oz/ [ku.oz] 'weave-FUT.3SG', /ku-iz/ [ku.iz] 'weave-PRT.3SG' etc. The latter is a quasi-minimal pair of [kwiɲ] '3'. Although there is no /ɑ/-initial verbal suffix, similar forms are present in declination: /ku-ɑz/ [ku.ɑz] 'fur-POSS.3SG.INE/ILL (a quasi-minimal pair of [kwɑʑ] 'weather')'. Thus, the rule must be completed with the term that desyllabification happens only in non-derived contexts; that is, when /u/ is not separated from the following vowel by a morphological boundary.

However, there are some words which do not support this analysis. In these, [u] is followed by a vowel in monomorphemic words (stems): [duɑ] 'blessing', [duɑk] 'suddenly', [duɑ-] 'get angry, lose temper', [nuɑcjɑ-] 'ridicule, mock, laugh at', [tuɑłɑ] 'contemporary, modern', [tuɑʌet] 'toilette', [c͡ɕuɑk] 'immediately, quickly', [ɕuɑk] 'suddenly, hurriedly'; [tuik] 'the rounded half of an egg'; [due] 'camel', [pued] 'flu', [tue] 'this year' etc. As a consequence, the allophonic rule of desyllabification must be expanded with a new condition besides monomorphemicity, namely that it happens only after a (word-initial) /k/. However, such a rule would be very arbitrary and phonologically unmotivated. Additionally, monomorphemic vowel sequences are quite rare in Udmurt, and the sequence [wɑ] is more frequent (at least in the lexicon, but as it also occurs in frequent words, by all probability, in texts as well) than monomorphemic vowel sequences. As a consequence, such an analysis must be rejected.

Another obvious assumption is that [w] is an allophone of /v/: however, as word-initial consonant clusters are untypical for Udmurt, it would be very arbitrary to suppose that there is an underlying, but never surfacing, consonant cluster in these cases (see below). Additionally, there are a handful of Russian loanwords beginning with [kvɑ-]: [kvɑdrɑt] 'square', [kvɑrtɑł] 'district', [kvɑrcirɑ] 'apartment, flat', etc. Thus, this assumption should also be rejected.

The analysis, which calculates with the approximant /w/ only requires the introduction of this segment into the consonant system. Additionally, it also assumes the existence of branching onsets. In contemporary Udmurt, the existence of branching onsets must be accepted because of the Russian loanwords. However, in native words, branching onsets are extremely rare. Moreover, when they exist, as in the case of Standard Udmurt /skɑł/ 'cow', different strategies for the elimination of the stem-initial cluster are attested in dialects: /iskɑł/, /ɨskɑł/, /sɨkɑł/ etc. (Wichmann 1987, 67). Similar elimination strategies are not attested in the case of the supposed /kw/ onsets.

Even though branching onsets are common in contemporary Udmurt, it is clear that they were absent for a long time after [kw]-initial words emerged. Consequently, the price includes the introduction of branching onsets at least when analysing the stage of linguistic development before the massive borrowing of Russian words. Even in this case, this price is not necessarily high. If the regularities of syllable-forming are not interpreted as categorical differences between allowing or prohibiting branching structures but as a gradual limitation of acceptable and non-acceptable structures based on their well-formedness, a stop + approximant cluster is the best-formed branching onset. That is, the acceptance of such onsets is just a minimal concession to the rigour of the regularities of syllable-formation.[6]

Up to this point, it seems that the price of analysing the phone [w] following the word-initial [k] is not much higher than that of introducing a phoneme corresponding to it, /w/. However, the fact that a consonant occurs only in a cluster, and even there only stem-initially, where clusters usually do not occur, is very suspicious, and it must be calculated in the price.

The analysis with diphthongs requires the introduction of two new segments, /u̯ɑ/ and /u̯i/. Moreover, the price of the latter is especially high, as it must be introduced due to a single word, /ku̯iŋ/ '3'. Additionally, the introduction of these diphthongs must be accompanied by the introduction of a new structure, namely the branching nucleus.[7] Furthermore, it is difficult to explain why diphthongs occur only after a stem-initial /k/. Even more, although the initial syllable has a kind of prominence in Udmurt (e.g. the vowels /u/ and /ə/ occur only exceptionally in non-initial syllables), usually the ultimate syllable is stressed. It is more likely that if diphthongs are restricted in position, they appear in the stressed syllable. In Udmurt, these

[6]According to Maddieson (2013), in Darai, only the onset can be branching, and only /w/ can occur as the second consonant there. However, according to Kotapish and Kotapish (1975), there are only a handful of words beginning with a cluster: in addition to *bwaa* 'father', mentioned by Maddieson, *Dhwaak* ~ *Thwaak* 'tap', *swaa karike* 'to hiss', *swila* 'knitting needle', *swiya karike* 'to squeak'. Maybe Darai data can also be interpreted differently, e.g. with diphthongs.

[7]One could argue that the diphthongs are not new segments, they are just combinations of segments in the nucleus. However, diphthongs do not normally arise as a free combination of the monophthongs of a language. This restriction does not hold only for Udmurt, but cross-linguistically: there is hardly any language in which all the vowels occurring in simple nuclei can be combined into diphthongs.

supposed diphthongs occur in unstressed syllables only if the stem is monosyllabic and unsuffixed.

Supposing a phoneme /kʷ/ seems to be a very economical solution. It needs the introduction of only one phoneme, and it does not require the assumption of a branching onset or nucleus. However, it needs the introduction of a consonant with secondary articulation: such consonants are otherwise unknown in Udmurt. (Except for some dialects, where palatalised sibilants are used instead of palatal ones, cf. Kel'makov 1998, 80–81). Even in this case, an explanation for why /kʷ/ occurs only stem-initially and preceding /ɑ/ or /i/ is required.

Before comparing the prices of the different solutions, another issue must be considered. Sources supporting the diphthong analysis sometimes mention a third type of diphthong, /ɑu̯/, occurring in the word /tɑu̯/ 'thanks' (cf. Winkler 2001, 8; Suihkonen 2023, 578). However, it seems that the only argument that can support such an analysis is that there is not a stressed [u] in the word. However, if the existence of /w/ is supposed, it can be analysed as /tɑw/; if the existence of /kʷ/ is supposed, it can be still analysed as /ˈtɑ.u/ (the latter analysis is also possible if /w/ is supposed). The unusual stress pattern of /ˈtɑ.u/ can be explained by its foreign origin (< Chuvash /tɑw/ 'gratitude, thanks'). As there are no morphophonological tests to distinguish simple and branching nuclei in Udmurt (if the latter exist at all), and 'thanks' is unsuffixable anyway, there is no possibility to decide on this problem.

Additionally, even if the phonological representation for 'thanks' /tɑu̯/ is accepted and a branching nucleus is assumed for this case, it does not help much with the analysis of the other relevant cases with diphthongs. In this case, the existence of three diphthongs, /u̯ɑ/, /u̯i/ and /ɑu̯/ must be supposed, of which the latter two occur only in one stem each. It seems to be a very high price compared to the other two possibilities.

Comparing the three possibilities, the introduction of one new segment, the consonant /w/ or /kʷ/, is much better than the introduction of two diphthongs, one of which should be supposed for the sake of only one stem. The advantage of the introduction of /kʷ/ over the introduction of /w/ or diphthongs is that no branching onsets or nuclei must be assumed. However, the assumption of /kʷ/ needs the introduction of consonants with a secondary articulation. There seems to be no strong arguments to decide whether the introduction of branching onsets or the introduction of consonants with a secondary articulation should be considered as a higher price. Nonetheless, the analysis with a phonemic /w/ has the disadvantage that /w/ occurs only in a very marked position, namely as the second part of a stem-initial cluster (in a language otherwise dispreferring branching onsets).

Consequently, the analysis with /kʷ/ seems to be the most proper one, simply because the analyses both with /w/ and with diphthongs are quite problematic, while the analysis with /kʷ/ needs just the introduction of one, although new type of consonant. Although the distribution of this consonant is restricted, similar restrictions are also present if one supposes a phoneme /w/ or diphthongs.

3. THE ANALYSIS OF STEM-INITIAL [W]

In certain dialects of Udmurt, [w] can also occur stem-initially, and it is always followed by /ɑ/. As word-initial vowel sequences are not attested in Udmurt, the analysis of [w] as an allophone of /u/ must be excluded. The analysis of [w] as an allophone of /v/ must also be excluded, as stems beginning with [vɑ] (even native ones) occur.

Some factors clearly favour the analysis with /w/. On the one hand, it does not need an introduction of a new phoneme, and all the attested words can be analysed with /w/. On the other hand, although it does not solve the problem of why /w/ occurs in a second position of an onset while the language disprefers branching onsets, at least it does not appear only in that position in these dialects. This fact strongly reduces the price of this analysis.

At first sight, the fact that stem-initial [w] does exist completely excludes the analysis of stem-initial with [kw] as the realisation of a phoneme /k^{w}/. However, it is not the case: one can suppose that [kw] is the realisation of /k^{w}/, while stem-initial [w] is the realisation of /w/. Self-evidently, as this analysis requires the introduction of two consonants, it is more costly than the analysis with just one /w/. Even so, if it is considered that the analysis with a stem-initial /kw/ assumes an otherwise unusual onset structure, while the analysis with a stem-initial /k^{w}/ does not, the difference between the two is not so significant. Additionally, the introduction of two consonants is not as pricey as the introduction of two new diphthongs, since both consonants occur in several stems, while /u̯i/ occurs only in one stem. Moreover, the similar articulation during the realisation of /w/ and /k^{w}/ can be an explanation for their similar distribution.

The presence of the stem-initial [w] does not influence the cost of the analysis with diphthongs. As word-initial [wi] does not occur, the main drawback of this analysis remains. The fact that the supposed diphthongs can also occur stem-initially, i.e. in syllables with an empty onset, not just after /k/, does not make the analysis more acceptable.

Summing it up, the analysis with /w/ seems to be the most appropriate one for the dialects exhibiting both word-initial [kw] and [w]. However, the analysis with two consonant phonemes, /w/ and /k^{w}/, does not seem to be much worse. The analysis with diphthongs, although it cannot be excluded, is much more costly; therefore, much less convincing compared to the other two possibilities.

4. THE ANALYSIS OF POSTVOCALIC [W]

The [w] appearing outside the stem-initial onset is historically distinct from [w] in the stem-initial onset. While [w] in the stem-initial onset is always a relic from Proto-Udmurt (and at least in some cases from Proto-Permic, cf. Csúcs 2005, 111–112, 351, 392–398), [w] outside the stem-initial onset is always the result of a relatively recent development from /ɬ/.

In most dialects, the realisation of /ɬ/ as [w] is optional (cf. Kel'makov 1998, 96–99), which means that there is a [ɬ] ~ [w] vacillation in the given position. These variants of Udmurt do not cause further difficulties for the analysis, as any vacillating realisation can be analysed as the realisation of the phoneme /ɬ/.

The problem arises if in a dialect with [ɬ] ~ [w] vacillation, there are words which are always realised as [w] in the same position as vacillation occurs. In this case, an explanation is needed for the impossibility of the realisation as [ɬ]. The analysis of [w] as the realisation of /u/ should be rejected since vowel sequences are dispreferred in Udmurt: intervocalic [w] would be analysed as a vowel between two vowels. That is, sequences consisting of three vowels would be assumed underlyingly. The analysis of [w] as the realisation of /v/ is absolutely excluded, as [v] occurs in postvocalic positions as well.

The most straightforward analysis is that the non-vacillating [w] is the realisation of the phoneme /w/ or of the second element of a diphthong with /u̯/ as its second component. (The problem is even more complicated if the realisation [ɬ] is always acceptable instead of a [w] outside the stem-initial onset, but there are words which are consistently pronounced with an [ɬ] in the same positions. These [ɬ]s must be analysed as the realisations of /ɬ/, but it is not clear how to analyse the vacillating ones, as the analysis of an [ɬ] as a realisation of /w/ is not convincing. Although such cases are not reported, it seems to be highly probable that while otherwise vacillation is general, at least some recent Russian loanwords are consistently pronounced with /ɬ/, and the use of these words cannot always be interpreted as code-switching).

Another possibility worth considering is when the [ɬ] > [w] change is complete in postvocalic positions. In this case, [ɬ] is never realised in the given position.[8] Due to the complementary distribution, it is still possible to analyse these as the realisations of the phoneme /ɬ/: it can be supposed that /ɬ/ is realised as [ɬ] in onsets following a word boundary or a consonant, but as [w] otherwise. This kind of analysis is possible until loanwords with [ɬ] in the latter position are not borrowed. However, although nothing excludes such an analysis, it would hardly occur to any phonologists without observing parallel patterns in other dialects or in historical data. (If the change is not complete in both positions, stems will occur with a final [w] : [ɬ] alternation, which supports the idea that one phoneme has two realisations). It is much more evident that if /w/ is assumed in the phoneme system, then every instance of [w] is analysed as the realisation of /w/ and not of any other phoneme.

The situation is a bit different if diphthongs are supposed. In this case, it is possible to accept only the existence of falling diphthongs and to analyse [w] followed by a consonant or a word-boundary as the realisation of /ɬ/. However, the case of intervocalic [w] is more problematic. On the one hand, although words like [kwɒwɑ] – cf. Wichmann (1987, 139) *kṷåṷa* – can be analysed as /kṷɑɬɑ/ instead of /kṷɑṷɑ/, the different analysis of the two [wɑ] sequences can hardly be justified. (The realisation [ɒ] does not play any role here, [ɒ] appears instead of [ɑ] due to the following [w]). On the other hand, the different analysis of [w]s developed from [ɬ] in different positions (and not alternating with [ɬ] anymore) is hardly justifiable. Instead, it is more consistent to analyse them in the same way.

Before comparing the different possibilities for analysis, it must be clarified that stem-initial [w] and [w] outside the stem-initial onset do not seem to occur in the same dialect (cf. Figure 1). According to Kel'makov (1998, 83–84), stem-initial [w] occurs in the Lower and Middle Cheptsa subdialects of the Northern dialect, in the Beserman dialect, in a part of the Lower Izh subdialect of the central southern dialect and the Tatyshly and Buy-Tanyp subdialects of the peripheral southern dialect. Additionally, it sporadically occurs in the transitional central subdialects. According to Kel'makov (1998, 99), the [ɬ] > [w] change occurred in most of the transitional central subdialects, in some central southern subdialects, and in the Shoshma and Kukmor subdialects of the peripheral southern dialects. Among the central southern subdialects, it is mentioned that the phenomenon also occurs in a part of the Alnash Rayon. The Lower Izh subdialect can be identified more or less with the territory of the Alnash Rayon. (Notice that

[8]It is unclear whether such variants exist at all. According to Kel'makov (1998, 99), the change [ɬ] > [w] was most consistent in the eastern central transitional dialects and in the peripheral southern Shoshma subdialect. However, in the texts published by him from these variants (Kel'makov 1998, 212–214, 244–248) [ɬ]s are sometimes preserved at least in intervocalic positions (in the Shoshma texts also in the coda).

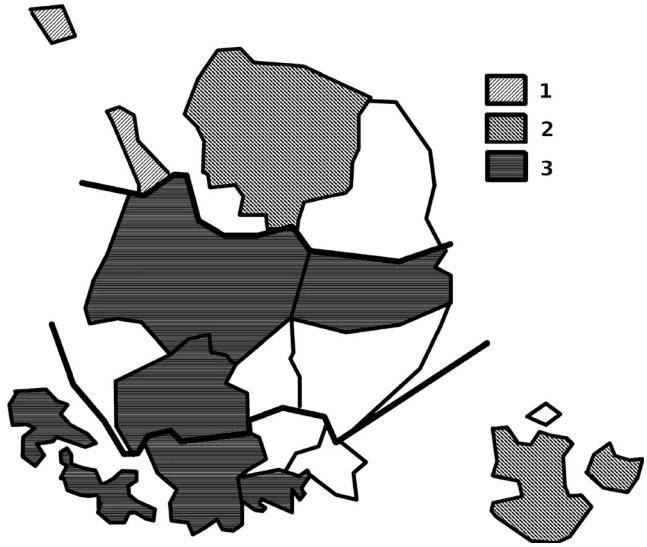

Figure 1. The approximate geographical distribution of dialectal features concerning [w]. 1: only word-initial [w]s; 2: onset [w]s both word-initially and following stem-initial [k]s; 3. [w]s both following stem-initial [k]s and outside the stem-initial onset (regardless of the distribution and frequency of the latter). The situation on the territories marked white is the same as in Standard Udmurt. Based on Kel'makov (1998, 83–85, 99)

although Kel'makov uses the names of various southern central subdialects, he expresses his doubts that the traditional division of the central southern dialects is grounded; cf. Kel'makov 1998, 216). It is emphasised that the change did not occur in the northern and the Beserman dialect and most of the peripheral southern subdialects, including the Tatyshly and Buy-Tanyp subdialects. If dialects both with stem-initial and coda [w] were available, the existence or lack of [wɑw]-like words should be taken into consideration. The existence of such patterns would be a challenge for the analysis with diphthongs, as triphthongs should also be considered. On the contrary, if the pattern [wɑw] did not appear where it is expected, it would support the analysis with diphthongs.

Similarly to the case of the dialects with a stem-initial [w], the existence of postvocalic [wɑw] strongly supports the analysis with a phonemic /w/. The analysis with both /k^{w}/ and /w/ is less favourable because of the supposition of two additional phonemes instead of one; however, it gives an explanation why [w] always occurs after [k] in the stem-initial onset.

The price of the analysis with diphthongs depends on whether [w] occurs in a coda or intervocally. If it occurs only in the coda, a range of rising diphthongs must be added (practically any vowel + /u̯/). (Even the rising type of diphthong can be considered as a new structural element, if [tɑw] 'thanks' is not analysed as /tɑu̯/). The case is even more complicated if also intervocalic [w]s occur. The problem is not just that in the case of patterns like [ɑwɑ] it would be necessary to determine the syllable boundary (whether it is analysed as /ɑu̯.ɑ/ or /ɑ.u̯ɑ/), but it also should be explained why diphthongs so often occur after or before a hiatus (that is, in

syllables without an onset or a coda). In any case, the analysis with diphthongs is costlier than the analysis with /w/ with or without the assumption of an additional /k^{w}/.

5. THE TESTIMONY OF HISTORICAL CHANGES

Although historical data should be ignored in the synchronic analysis, they may nonetheless offer new insights into the understanding of the synchronic state. Therefore, in this section, the ways of emergence and loss of [w] are surveyed.

According to Csúcs (2005, 340, 351), Udmurt stem-initial [kwɑ-] usually goes back to Proto-Permic *[ko-]. In these cases, Komi also has a stem-initial [ko-]. (However, for some examples, no related Komi word is shown. In these instances, a stem reconstructed for Proto-Finno-Permic, Proto-Finno-Ugric or Proto-Uralic supports the reconstruction for Proto-Permic). In one case, Csúcs reconstructs a stem-initial *[kwɑ-] even for Proto-Permic: *[kwɑc] ‘6’, contemporary Udmurt [kwɑc], Komi [kvɑjt], dial. [kvɑjc]. Stem-initial *[kw-] is also reconstructed for Udmurt stem-initial [kwi-]: *[kwiɬme] or *[kwiʎme] (Udmurt [kwiɲ], Komi [kujim], dial. [kvim]).[9] In one case, a vowel sequence is reconstructed for Proto-Permic: *[kuɑs] ‘ski’ (Udmurt [kwɑs], Komi [kɨəs]). If Proto-Finno-Ugric or Proto-Uralic reconstructions exist, usually they also begin with *[ko-], rarely *[kɑ-] or *[ku-]. Consequently, the most probable explanation for the emergence of the stem-initial [kwɑ-] is that it developed from *[ko-]: the articulatory phase of lip rounding became separated from the phase of lowering. In addition, lowering did not stop at [o] but continued, resulting in [ɑ]. The change could begin before the split of Proto-Udmurt and Proto-Komi, and continued only in Proto-Udmurt. However, the change was not consistent even there, as several stems reconstructed to Proto-Permic and beginning with *[ko-] do not begin with [kwɑ-] in contemporary Udmurt (generally, they begin with [kwɑ-] – Csúcs 2005, 348–351).

While only two stems beginning with *[kw-] are reconstructed, there are considerably more stems, exactly 12, which are /vɑ/-initial in contemporary Standard Udmurt and are reconstructed with stem-initial *[w-], more specifically *[wo-] or *[wɔ-] (Csúcs 2005, 392–393).[10] These are mostly reconstructed based on the Udmurt dialectal data beginning with [wɑ-]. In these cases, Standard Komi equivalents usually begin with [vo-] (exceptionally [u-] or [ə-], but equivalents in certain dialects with [o-] or [ʊ-] (exceptionally [u-]). When Proto-Finno-Permic or Proto-Finno-Ugric

[9] Csúcs (2005, 351) reconstructs *[kwiʎme] or *[kwinme] for Proto-Permic. The phonemic development of this word is quite complicated. On the one hand, the Proto-Uralic word is reconstructed with /o/, which should result in word-initial [kwɑ] in Udmurt and [ko] in Komi. The fronting and raising of the vowel could be explained by the palatality of the following consonant, but the change is not regular (cf. Udmurt [kwɑc], Komi [kvɑjt] ‘6’). On the other hand, /ɲ/ is also an irregular reflexion of Proto-Uralic *[lm]. The palatalisation of the nasal could be explained by the preceding [i], the appearance of which, in that case, cannot be explained by the influence of the following palatal consonant. An alternative explanation for that is the analogical influence of the preceding numeral [kɨk] ‘2’. However, once again, this is equally true for [kwɑc] ‘6’ (cf. [vic] ‘5’).

[10] The only stem reconstructed beginning with *[wɑ-] is *[wɑʑɨ-] ‘to descend, to come/go down, to let oneself down’, cf. Standard Udmurt [vɑʑɨ-], dial. also [wɑɕkɨ-], which has no equivalent in Komi. In all probability, the reconstruction of *[woʑɨ-] or *[wɔʑɨ-] would be more appropriate here.

forms are also reconstructed, they begin with */o-/ or */ɑ-/.[11] However, according to Csúcs (2005, 320–321, 364, 389–392), several stems reconstructed for Pre-Permic with an initial */o-/ or */ɑ-/ did not develop into */wɑ-/ initial words in Proto-Permic.

To sum up, the change [o] > [wɑ] happened mostly word-initially in the Permic period. The same change also began after [k] before the split of Proto-Permic, but it continued only in Udmurt (and the emerging patterns developed further in Komi). As the consonantal environment does not seem to play any role in this change, the process can be most adequately described as diphthongisation. These facts support an analysis with diphthongs.

However, the loss of [w] shows a different picture. In general, the typical change is [w] > [v]: it occurs in a stem-initial position in most of the dialects, and even following a stem-initial [k] in some of them. These facts suggest a change /w/ > /v/, that is, it supports the analysis with an approximant.

Sporadically, [w] was completely lost, as in the compound [korkɑ] 'house' (originally 'log house', cf. [kor] 'log, beam' + [kwɑ] (archaic) 'house, cultic building, summer kitchen'). This development can be analysed as the delabialisation of /k^{w}/, the simplification of the cluster /rkw/ or the monophthongisation of /u̯ɑ/. In some dialects, [kwiŋ] '3' changed into [kuŋ] or [kɯŋ]: in the latter case, either the following palatal consonant caused the fronting, or the labiality of [w] and the frontness of [i] were merged into one vowel (cf. Wichmann 1987, 142; Kel'makov 1998, 57 etc.). Additionally, stem-initial *[w] reconstructed for Proto-Permic was lost in some Komi dialects, which can be analysed both as the deletion of /w/ or the monophthongisation of /u̯ɑ/. However, there is not a single case of change where the supposed diphthong changed into a long vowel, that is, the nucleus remained branching but the quality of its elements flattened out.

The considerations above suggest that the new pattern emerged as a diphthong, but at some point it was reanalysed as a sequence of an approximant and a simple vowel. The approximant later changed into a labiodental fricative (or was lost). However, it is not clear at what point the reanalysis happened. The time of the reanalysis should be determined by the synchronic analysis of the intermediate stages. However, as it was demonstrated in the previous sections, the synchronic analysis is always ambiguous.

Additionally, the historical approach above is based on the assumption that a phonological structure always changes minimally, that is, its result is a phonological structure minimally differing from the old one. It is not necessarily the case. Speakers have no immediate access to each other's phonological representation; they just interpret the sound flow they hear. Suppose someone begins to articulate a vowel in a diphthongal way. In that case, the listener can immediately reinterpret the initial [u̯] element as an approximant, a labialisation of the preceding consonant, or even as a labiodental fricative. As a consequence, the attested changes cannot support the attempt at synchronic analysis.

6. CONCLUSION

This study surveyed the possible analyses of [w] in Udmurt dialects. As it was presented in Sections 2–4, the analysis without supposing branching nuclei always seems to be better than the

[11] wɑʑi-/ 'to descend, to come/go down, to let oneself down' is exceptional from this point of view as well, as it is reconstructed to go back to Proto-Finno-Permic */wɑc͡ɕ-V/ (where /V/ stands for an unknown vowel).

analysis with diphthongs. When [w] occurs just after [k], the analysis with a labialised stop /k^{w}/ seems to be the most economical. However, when [w] occurs also in other positions (and not as an allophone of [ɬ]), the approximant phoneme /w/ must be assumed. In this case, [kw] can also be interpreted as the cluster /kw/. However, although the analysis with diphthongs is less economical as it requires the assumption of more phonemic segments than any of the analyses with consonants, it cannot be considered totally mistaken. The only problem with the analysis involving diphthongs is that it unnecessarily complicates the analysis, although not excessively. Consequently, just a preference order of the possible analyses can be established, and a single proper analysis cannot be chosen. From this it also follows that any description of Udmurt mentioning just one possible analysis and ignoring the others is inevitably misleading.

As a further result, it is practically impossible to answer unambiguously such basic questions of phonological typology like whether Udmurt has branching nuclei or onsets (or at least in the latter case, what kind of branching onsets it has), whether it has labialised consonants (or consonants with secondary articulation at all), etc. The situation in Udmurt rather raises the question of whether the phoneme system of a language can always be determined unambiguously. If the answer is no, it also calls into question whether the concept of phoneme is suitable for linguistic analysis.

Nonetheless, it is also important to keep in mind that the main problem for the analysis is the restrictedness of the environments in which [w] occurs. No matter what phoneme is realised this way, its behaviour cannot be attested in a wide range of contexts, and this makes it impossible to determine its behaviour. That is, the marginality of the phoneme is closely related to its unaccountability.

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ABBREVIATIONS

3	third person
PRS	present
SG	singular

REFERENCES

Antal, Gergej [Antal, Gergely]. 2020. Fonetičeskaja realizacija zaimstvovanij anglijskogo proisxoždenie v udmurtskom jazyke [A phonetic analysis of words of English origin in Udmurt]. In O. B. Strelkova (ed.) Permistica 18 [Permistics 18]. Izdatel'skij centr «Udmurtskij universitet». 7–21.

Bartens, Raija. 2000. Permiläisten kielten rakenne ja kehitys [The structure and the history of the Permic languages]. Helsinki: Suomalais-Ugrilainen Seura.

Csúcs, Sándor. 1990. Chrestomathia votiacica. Budapest: Tankönyvkiadó.

Csúcs, Sándor. 1998. Udmurt. In D. Abondolo (ed.) The Uralic languages. London & New York: Routledge. 276–304.

Csúcs, Sándor. 2005. Die Rekonstruktion der permischen Grundsprache [The reconstrucion of the Permic proto-language]. Budapest: Akadémiai Kiadó.

Edygarova, Svetlana. 2022. Udmurt. In M. Bakró-Nagy, J. Laakso and E. Skribnik (eds.) The Oxford guide to the Uralic languages. Oxford: Oxford University Press. 507–522. https://doi.org/10.1093/oso/9780198767664.003.0023

Itkonen, Erkki. 1953. Zur Geschichte des Vokalismus der ersten Silbe im Tscheremissischen und in den permischen Sprachen [To the history of the vowel system of the first syllable in Mari and in the Permic languages]. Finnisch-Ugrische Forschungen 1953. 149–345. https://journal.fi/fuf/article/view/112678.

Kel'makov, V. K. 1998. Kratkij kurs udmurtskoj dialektologii [A short course of Udmurt dialectology]. Iževsk: Izdatel'stvo Udmurtskogo universiteta.

Kálmán, Béla (ed.). 1976. Wogulische Texte mit einem Glossar [Mansi texts with a glossary]. Budapest: Akadémiai Kiadó.

Kotapish, Carl and Sharon Kotapish. 1975. A Darai–English, English–Darai glossary. Kathmandu: Tribhuvan University.

Maddieson, Ian. 2013. Syllable structure (v2020.3). In M. S. Dryer and M. Haspelmath (eds.) The world atlas of language structures online. Leipzig: Max Planck Institute for Evolutionary Anthropology. https://wals.info/chapter/12.

Rédei, Károly. 1988. Geschichte der permischen Sprachen [A history of the Permic languages]. In D. Sinor (ed.) The Uralic languages. Leiden: Brill. 351–394.

Riese, Timothy (ed.). 2001. Vogul. München: Lincom Europa.

Suihkonen, Pirkko. 2023. Udmurt. In D. Abondolo and R.-L. Valijärvi (eds.) The Uralic languages. London & New York: Routledge. 576–613.

Tarakanov, I. V. 1964. K voprosu istorii is razvitija neslogovogo u̯ v udmurtskom jazyke [to the issue of the non-syllabic u̯ in the Udmurt language]. In Vorposy finno-ugorskogo jazykoznanija. Grammatika i leksikologija [issues of Finno-Ugric linguistics. Grammar and lexicology]. Moskva – Leningrad: Nauka. 75–82.

Wichmann, Yrjö. 1987. Wotjakischer Wortsatz Udmurt vocabulary. Helsinki: Suomalais-ugrilainen Seura.

Winkler, Eberhard. 2001. Udmurt. Muenchen: Lincom Europa.