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QUANTITY IN MOKSHA-MORDVIN

Abstract. This article provides empirical data concerning the prosody of the Moksha language: it evaluates the effect of the position of stress, the characteristics of word structure, and the position of a word in an utterance upon the temporal relationship between the syllable nuclei. Acoustical analyses were carried out using a set of target words embedded in frame sentences, which were read by eight speakers of Central Moksha. As an extension to the main part of the analysis, a comparison of the data for Moksha and results obtained earlier in an analogous study of the temporal characteristics of vowels in Erzya is offered.

Keywords: the Moksha and Erzya languages, stress, intrinsic duration, syllable, vowel reduction.

1. Introduction

It has been noted in earlier works on the phonetics of the Mordvin languages, especially following the observations of Heikki Paasonen (1903), that the manifestations of stress and the system of vowels in Erzya and Moksha diverge to a considerable extent. Systematic research on the prosodic features of the Mordvin languages in the framework of acoustic phonetics has begun only since the turn of this century (e.g. Lehiste, Aasmäe, Meister, Pajusalu, Teras, Viitso 2003; Estill 2004; Aasmäe 2006; 2009; Aasmäe, Ross 2008; Zirnask 2010; Aasmäe, Pajusalu, Zirnask 2011). Empirical data are hitherto available mostly on Erzya. It should be noted that the first acoustic data of Moksha were published in the 1960–1970s (Sovijärvi 1963; Деваев, Цыганкин 1970 : 16–19; Деваев 1975). A. Sovijärvi has examined the formant structure of the schwa vowel (*ə*); the theme has been lately treated in Estill 2011. In S. Z. Devayev's works the conditioning role of stress upon vowel durations has been demonstrated in a small set of words read by one informant. Vowel duration data based on a fairly large-sized set of words have been provided of late (Zirnask 2010); observations have been made on a South-Western variety of Moksha spoken in Novo-Badikovo, a locality in the Zubova Polyana region of the Republic of Mordovia. As material, target words embedded in a frame-sentence were used. Vowel durations in the test words read by two informants showed dependence on the position of stress.

In the case of Moksha, duration can be, *a priori*, regarded a cue to stressedness for two reasons. Firstly, the length of the segments is not contrastive in the language — there are neither long vowels and diphthongs nor geminates; hence, duration “is available for serving as a phonetic cue to stressedness” (Lehiste, Aasmäe, Meister, Pajusalu, Teras, Viitso 2003 : 85). Secondly, Moksha is characterized by the presence of vowel reduction, which is considered to be a phenomenon conditioned by duration-based stress (Bybee, Chakraborti, Jung, Scheibman 1998; Crosswhite 2004; Barnes 2006). In view of these typological maxims, the aim of the present paper consists in providing evidence to attest to the conditioning role of stress for vowel durations in Moksha. Analyses presented in the paper are based on the core variety of Moksha, namely, sub-dialects of the Central dialect group, which is the prototype of the literary language (see, for example Feoktistov 1990 : LXXI–LXXXVI). As an extension to the main part of the analysis, a comparison of data obtained by now on the temporal characteristics of stressed and unstressed vowels for both Moksha and Erzya is offered.

2. Data analysis

2.1. Material and procedures

Taking into account the scarcity of acoustical data for Moksha, measurements of controlled speech were only used in this research. Recordings were made of 104 target words of varied structure (composed of 1 to 6 syllables) embedded in the phrase- and sentence-final positions of a frame sentence as follows:

- a) *Märgəl'ín m a k s ä, af ś i j ä* 'I would say liver, not silver'
b) *Märgəl'ín ś i j ä, af m a k s ä* 'I would say silver, not liver'

The sentences read by 8 informants yielded a total of 1664 tokens. The material was recorded in 2008 by Tatiana Zirnask. For the acoustic measurements the PRAAT software (Boersma, Weenik 2007) was used. The informants were residents of the localities indicated below (in the list, the initial letters of the informants' names are given):

- Mordovskaja Kozlovka (*Kargońžaj*) of the Atjurjevo region: JM, a female aged 50; NN, a female aged 39; IS, a male aged 56; NM, a male aged 54
- Pol'skoje Tsybajevo (*Pakśań Porańa*) of the Temnikov region: JS, a female aged 53
- Mordovskije Parki (*Mokšeń Parka*) of the Krasnoslobodsk region: ST, a female aged 41
- Zaitsevo of the Kovytkino region: TR, a female aged 40; VT, a female aged 34

Prior to the measurement procedures, the location of stress in the test-words was assigned (through repeated listening by T. Zirnask, a native Moksha and N. Aasmäe, a native Erzya). In the majority of cases (nearly 90 percent of the words), stress was marked on first syllables. Cases of non-initial stress included words like *śijä* 'silver', *kundasamak* 'you will catch

me' having a high vowel (*i, u*) in the first syllable and a low vowel (*a, ä*) in a subsequent syllable. There was, however, some variation in the placement of stress in such words. A same speaker could pronounce them with initial stress in one utterance and non-initial stress in another utterance. In words with more than two syllables, e.g.: *ajd'amajt'* 'you chased me', *ajd'asajně* 'I chase them', *kundańd'erásamak* 'if you catch me', additional stress was present — the words tended to be uttered with stress on either odd- or even-numbered syllables. Some authors find it possible to define stress in Moksha as relatively free. Alternation in the placement of stress has been noticed in folksongs as well as in speech, particularly in certain dialects (Деваев, Цыганкин 1970 : 16–19; Ломакина 1966 : 308; Азрапкин 1966 : 264–265; Феоктистов 1979 : 148). Herein, stress will be indicated as a dot following the symbol of a vowel, like in *šijä·/šijä·*.

The set of vowels identified in the speakers' productions (*a, o, u, i, e, ä, ə*) corresponds to the inventory of seven vowels used in the majority of the dialects of Central Moksha (see Иванова 2006 : 35–36). In unstressed syllables reduced variants of the vowels (for example *ǎ, ě*) occurred, alongside the schwa (*ə*) vowel. It is to be noted that a syllable with *ə* in Moksha can receive stress; the schwa vowel in such cases is produced as a mid vowel of full-formation (there is no special symbol for the schwa vowel in orthography — letters used to mark the other vowels also stand for *ə*).

There was a considerable amount of inter- and intra-speaker variability observed in the quality of vowels, especially in the word-final position. See some of the examples of the inconsistent use of *ä, e*: *käd'/ked'* 'a hand', *eji/äji* 'icy', *kemǎń/kimǎń* 'ten', *pil'e/pil'ě/pil'ə/pil'i/pil'ä* 'an ear' and the diphthongization of *o*: *nokan/nuokan* 'I want', *lomań/luomań* 'a person'. The question of vowel quality is not treated in the present analysis (some data on the quality of vowels for Northern Moksha have been given in Fournet 2010).

Variation in vowel durations may be conditioned, in addition to stress, by factors including "... the phonetic nature of the segment itself (intrinsic duration), preceding and following sounds, other suprasegmental features, and position of the segment within a higher-level phonological unit" (Lehiste 1996 : 226–229). The relevance of the morpho-phonological aspect for vowel duration variability has been shown on a set of data for some Erzya dialects considered to have been influenced by Moksha (Aasmäe, Ross 2007).

In the present analysis, the effect of several phonetic factors has been taken into account. To check the influence of the prosody of an utterance upon the relationship between vowel durations in a word, the target words were embedded in two positions within the frame sentence, as mentioned above. Though the conditioning role of consonant environment upon vowel duration in Moksha was not examined, it could be envisaged; to avoid bias in the results of measurement, the word corpus used for analysis was compiled so that varied consonant segments appeared in different positions within the words. As an important factor conditioning the duration of vowels within a word, the position of stress in a word was considered. In addition, the effect of the intrinsic duration of vowels as well as the number and types of syllables constituting the words were tested.

2.2. Results

2.2.1. Duration of vowels in stressed and unstressed syllables

Data for disyllabic and trisyllabic words (see Table 1), in which stress was marked on first syllables (with additional stress marked on third syllables) displayed an asymmetry between the duration of the stressed and unstressed syllable vowels (V1 and V2): longer vowel duration was observed in the stressed syllables. Disyllabic words showed a very highly significant difference between the values of vowel duration ($p = 1\text{E-}23$, $F = 106.3$, $F_{\text{crit.}} = 3.85$) in the phrase-final position. In the sentence-final position, where pre-boundary vowel lengthening is likely to occur, vowel durations did not significantly differ ($p = 0.358$, $F = 0.85$, $F_{\text{crit.}} = 3.85$). As it could be expected, the ratios of duration (V1/V2) across the observations in the phrase- and sentence-final positions significantly differed ($p = 1\text{E-}16$, $F = 71.23$, $F_{\text{crit.}} = 3.85$).

Table 1

Mean values of vowel durations (V1, V2, V3), in *ms*, and mean duration ratios between stressed and unstressed syllable nuclei (V1/V2), with values of standard deviation (st.d.): di- and trisyllabic words with stress on odd-numbered syllables occurring in a phrase- and sentence-final position.

Statistically significant differences between the values are starred:

*($p = 0.05$), **($p = 0.01$), ***($p = 0.001$)

disyllabic words		V1 (ms)	V2 (ms)	V1/V2	V3 (ms)
phrase-final	mean	116.0***	97.5***	1.2	
n = 438	st.d.	28.7	24.3	0.4	
sentence-final	mean	114.2	112.5	1.1	
n = 433	st.d.	27.6	25.6	0.3	
trisyllabic words					
phrase-final	mean	106.1***	74.7***	1.5	85.9
n = 110	st.d.	22.4	19.6	0.5	25.1
sentence-final	mean	105.8***	80.4***	1.4	104.6
n = 117	st.d.	25.5	22.8	0.4	24.4

In trisyllabic words, asymmetry between the vowel durations of the stressed and unstressed syllables (V1 and V2) was salient in both phrase- and sentence-final positions ($p = 6\text{E-}23$, $F = 123$, $F_{\text{crit.}} = 3.88$ for the phrase-final position; $p = 4\text{E-}14$, $F = 64.76$, $F_{\text{crit.}} = 3.88$ for the sentence-final position). The mean ratio of duration between the stressed and unstressed syllable nuclei (V1/V2) in trisyllabic words was much higher than in disyllabic words both in the phrase- and sentence-final positions.

Values of duration ratios across the observations of disyllabic words significantly differed from those of trisyllabic words both in the phrase- and sentence-final positions ($p = 5\text{E-}10$, $F = 40.03$, $F_{\text{crit.}} = 3.86$ for the phrase-final position; $p = 2\text{E-}21$, $F = 98.26$, $F_{\text{crit.}} = 3.86$ for the sentence-final position). Vowels in the third syllable of trisyllabic words, as seen from Table 1, are longer than those of the preceding syllable in both the phrase- and

sentence-final position. This observation supports the suggestion that trisyllabic words are likely to receive additional stress. In view of the data presented above stress can be qualified as duration-based. Consequently, syllables within a word tend to constitute trochaic feet; in trisyllabic words, there is a disyllabic foot followed by a degenerate foot (the latter having the potential of developing into a di-syllabic foot, compare, for example: *a:jd'äma:jt'* 'you chased me' and *a:jd'äsa:jhá* 'I chase them'). In the sentence-final position, due to the effect of pre-boundary lengthening, the duration of third syllable vowels is comparable to that of first syllable vowels, while in the phrase-final position it is, on the average, somewhat lower.

In words with stress on even-numbered syllables, e.g. *kunda-lit'* 'you would catch it/him/her', the relation between the duration of vowels in the second and third syllables was found to be analogous to that observed in the cases of stress on odd-numbered syllables (see Table 2). The length asymmetry between the nuclei of the two syllables was very highly significant in both phrase- and sentence-final positions ($p = 2.19E-15$, $F = 132.09$, $F_{crit} = 4.04$; $p = 1.32E-14$, $F = 112.43$, $F_{crit} = 4.03$, respectively). Mean duration ratios were much higher (1.9 in the phrase- and 1.7 in the sentence-final position) than in the case of stress on odd-numbered syllables. As to the initial unstressed syllable in *kunda-lit'*, it can have constituted a foot with the final syllable of the preceding word that was part of the carrier sentence, namely: *mä-rgəli-ń kunda-lit'*.

Table 2

Mean values of vowel durations (V1, V2, V3), in ms, and mean duration ratios between stressed and unstressed syllable nuclei (V2/V3), with values of standard deviation (st.d.): trisyllabic words with stress on the second syllable occurring in a phrase- and sentence-final position.

Statistically significant differences between the values are starred:

*($p = 0.05$), **($p = 0.01$), ***($p = 0.001$)

Trisyllabic words		V1 (ms)	V2 (ms)	V3 (ms)	V2/V3
phrase-final	mean	50.7	138.3***	77.0***	1.9
n = 25	st.d.	11.5	21.7	15.6	0.6
sentence-final	mean	50.4	143.3***	86.0***	1.7
n = 27	st.d.	10.7	22.5	16.8	0.4

The effect of additional stress upon the relationship between vowel durations within a word was further examined in a subset of words with 4 to 6 syllables (total number of observations — 35 for the phrase-final and 29 for the sentence-final position), in which the odd-numbered syllables were marked as stressed. For the phrase-final position, statistically significant differences were found between vowel durations of first and second syllables: ($p = 0.01$, $F = 6.69$, $F_{crit} = 3.98$), as well as of the third and fourth syllables ($p = 0.02$, $F = 6.13$, $F_{crit} = 3.98$). As polysyllabic words were under-represented in the corpus, this issue will have to be revisited on a broader material.

According to the results considered above, the place of stress in a word, the number of syllables constituting a word, and the position of a word in

an utterance can be considered to be factors conditioning the relationship between vowel durations in a word.

2.2.2. The effect of the intrinsic duration of vowels and of syllable structure upon the temporal relationship between the syllable nuclei

Vowel durations in subsets of mono-, di-, and trisyllabic words with high and low vowels (*i*, *u*; *ä*, *a*) were compared to find out the possible effect of the intrinsic characteristics of the segments upon the relationship between vowel durations. Mean durations of *a* and *i* in monosyllabic words (*ši* 'a day', *šit'* 'in the day-time', number of observations — 35 and *va* 'you see', *vaj* 'oh', number of observations — 38) are shown in Figure 1. Low *a* was longer than high *i* in both the phrase- and sentence-final positions, the mean durations of *a* being 156.8 *ms* and 165.9 *ms*, while those of *i* — 124.1 *ms* and 135.7 *ms*, respectively. The difference between the values of duration for *a* and *i* is statistically significant ($p = 0.001$, $F = 12.45$, $F_{crit.} = 4.14$ for the phrase-final position; $p = 0.002$, $F = 11.64$, $F_{crit.} = 4.11$ for the sentence-final position).

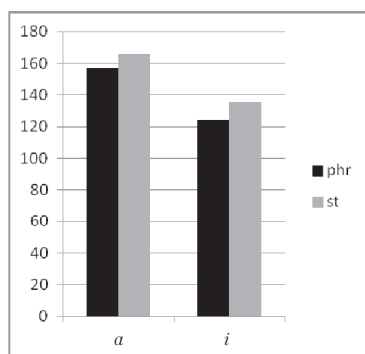


Figure 1. Vowel durations for low *a* and high *i* measured in monosyllabic words (phr = phrase-final position, st = sentence-final position).

Such a difference between the vowel durations implies that a high vowel occurring in a stressed syllable might not be longer than a low vowel in an unstressed syllable. The values of vowel durations in the disyllabic word *šijä* 'silver', in which stress was alternatively assigned to the first syllable (*ši·jä*) in some utterances (number of observations — 4) and to the second syllable (*ši·jä·*) in other utterances (number of observations — 9), are well in accordance with this assumption. In *ši·jä·*, the high vowel *i* of the stressed syllable was found to be shorter than low *ä* of the unstressed syllable (mean durations for the phrase-final position: 114.5 *ms* vs 120.5 *ms*). The duration of *ä* in the stressed syllable of *ši·jä·* by far exceeded that of *i* (mean durations for the phrase-final position: 101.4 *ms* vs 172.0 *ms*). Analogous to this, in the trisyllabic word *kundal'it'* 'you wanted to catch it/him/her', high *u* of the stressed syllable (*ku·nda'l'i·t'*, 1 observation) was shorter than low *a* of the unstressed syllable (71.0 *ms* vs 82.0 *ms*). The duration of *i* (99.0 *ms*) in the third syllable receiving additional stress and constituting a degenerate

foot slightly exceeded that of low *a* in the preceding unstressed syllable. In *kunda-l'it'* (number of observations — 7), the vowels *u*, *a*, *i* were, respectively: 57.6 ms, 132.7 ms, 84.7 ms long; *a* in the stressed syllable was considerably longer than *u* and *i* in the unstressed syllables. Thus, the intrinsic duration of vowels occurring in the stressed and unstressed syllables of a word is a factor conditioning the temporal relationship between the vowels.

Less transparent in this respect is the effect of syllable structure. Moksha is characterized by the occurrence of two or more intervocalic consonants at morpheme boundaries (as well as word-initial combinations of consonants) — a circumstance that posits the question of syllabification, unstudied for Moksha. It was noticed in the process of analysis that an epenthetic vowel can occur between consonants in such cases as, e.g.: *e'gě/e'(i)gě* 'a bead', *šel'mə/šel'(ə)mə* 'an eye', *käd'ga/käd'(i)ga* 'from hand to hand'; see also: *v'rgas/v'(ə)rgas* 'a wolf', *rdas/(ə)rdas* 'mud'; as a result, an extra syllable gets produced. The intricate question of syllable boundary is not treated in this paper; to evaluate the effect of syllable composition upon vowel durations, data for monosyllabic words ending in a vowel, CV, and a consonant or a combination of consonants, CVC(C), are first considered. Subsequently, vowel durations in series of disyllabic words will be analysed.

Figure 2 shows that vowels were longer in the CV series (number of observations — 57) compared to those in the CVC(C) series (number of observations — 156), mean durations being 154.0 ms vs 141.5 ms in the phrase-final position and 161.0 ms vs 149.5 ms in the sentence-final position, respectively. Statistically significant difference between vowel durations in the two series of words was observed in the data for the phrase-final position ($p = 0.04$, $F = 4.19$, $F_{crit.} = 3.93$).

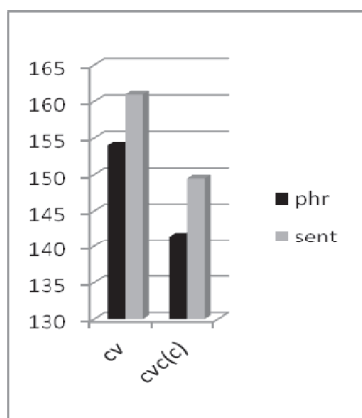


Figure 2. Vowel durations, in ms, for monosyllabic words ending in a vowel and a consonant (or a combination of consonants): CV vs CVC(C).

In the case of disyllabic tokens, the total number of which in the analysis was over 430, several subsets representing different types of word structure were selected to compare the relationship between vowel durations (see Table 3). Data for the whole subset of tokens represents an average pattern of vowel durations characteristic of disyllabic words.

Mean vowel durations (V1, V2) and duration ratios (V1/V2) with values of standard deviation (st.d.) in series of disyllabic words (stress on first syllable)

Series of words		Phrase-final:			Sentence-final:		
		V1 (ms)	V2 (ms)	V1/V2	V1 (ms)	V2 (ms)	V1/V2
all n = 438/433	mean	116.0	97.5	1.2	114.2	112.5	1.1
	st.d.	28.7	24.3	0.4	27.6	25.6	0.3
CVCV n = 76/78	mean	132.3	103.3	1.3	128.6	117.2	1.1
	st.d.	27.3	24.0	0.4	24.2	23.7	0.3
CVCVC n = 102/102	mean	117.1	94.1	1.3	116.2	104.9	1.1
	st.d.	30.3	22.7	0.3	28.4	24.0	0.3
CVCCVC n = 28/28	mean	105.3	89.5	1.3	98.3	91.1	1.1
	st.d.	22.9	27.0	0.4	20.9	22.6	0.3
CVCCV n = 197/197	mean	110.0	99.3	1.2	109.6	118.6	0.9
	st.d.	25.1	23.9	0.3	25.5	23.6	0.2
CVCCCV n = 15/15	mean	112.2	97.0	1.2	100.7	114.6	0.9
	st.d.	29.1	23.0	0.4	28.2	25.9	0.2

Compared to these, values of vowel durations (V1, V2; V1/V2) for the CVCV series are higher, while those for the other series are somewhat lower or differ very little. In the data for different series of words produced in the phrase-final position, a more salient difference between the durations of vowels in the first syllable, compared to the second syllable, can be seen. The difference between vowel durations in the first syllable of words in the CVCV series and each of the other word series was statistically significant (at values of $p < 0,001$). It might imply that in some of the series, like CVCCV, first syllables were produced as closed ones. There is another detail to be mentioned – vowels of the first syllable preceding combinations of consonants are shorter than those preceding a single consonant. It can be assumed that the first syllable in these cases is realized as a closed one. Lower variability of vowel durations in the second (unstressed) syllable might be due to the effect of vowel reduction, which tends to neutralize differences in vowel durations. Besides, three of the series – CVCV, CVCCV, CVCCCV – end with vowels. There was a statistically significant difference between the vowel durations in the second syllable found for the series CVCV and CVCVC ($p = 0,012$); second syllables in these series, to all appearances, can be identified as open *vs* closed. With respect to the ratios of vowel durations (V1/V2), also featured in figure 3, a statistically significant difference (at $p < 0,001$) was found between the values for the series CVCV and CVCCV, in which first syllables might be open *vs* closed.

In the sentence-final position, where pre-boundary vowel lengthening affects the vowel durations of the second syllable more than those of the first syllable, duration ratios for all the series are lower than those in the phrase-final position. In the series with internal combinations of consonants and ending with vowels, the values of duration ratios are below 1.0.

The data show a certain amount of variation conditioned by the closedness or openness of a syllable in disyllabic words.

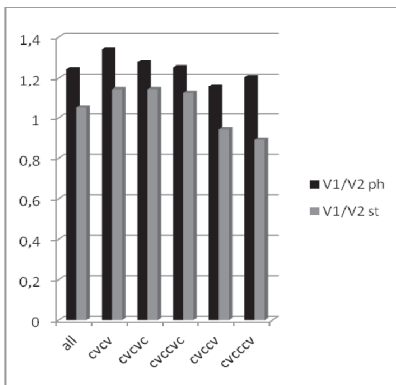


Figure 3. Vowel duration ratios (V1/V2) in series of words of varied structure produced in the phrase-final (ph) and sentence-final (st) position.

2.3. Interim conclusions

The subsets of data for the Central dialects of Moksha considered above show that stress is a factor that influences the temporal relationship between the syllable nuclei in a word; namely, stressed syllable nuclei tend to be longer than unstressed syllable nuclei. Under the influence of the position of a word in an utterance and due to a difference between the intrinsic duration of high and low vowels, in the stressed and unstressed syllables, asymmetry between the duration of the stressed and unstressed syllable nuclei in a disyllabic foot can be reverse, or vowel durations can be equalized. Trisyllabic words with stress on the first syllable are likely to receive additional stress on the third syllable, which contributes to the rhythmic patterning of a word as a sequence of a disyllabic and a degenerate foot. Length asymmetry between the vowels of a first (stressed) and a second (unstressed) syllable in trisyllabic words is more salient than in disyllabic words. The current analysis also showed a certain amount of variation conditioned by the openness *vs* closedness of a syllable; however, possible effects of syllable composition require further examination.

3. Comparison of vowel duration data: dialects of Moksha and Erzya

Vowel duration data of Moksha available at present on the Central dialect (8 speakers) and a South-Western sub-dialect (2 speakers; see Zirnask 2010) have been obtained on a same word corpus and proved to be compatible in all the parts of analyses. For this reason, only the results presented above will be referred to in the comparison of data for Moksha and Erzya. As far as evidence on Erzya is concerned, the results of research based on inter-dialect data (Aasmäe 2006) will be used. The previous work (Lehiste, Aasmäe, Meister, Pajusalu, Teras, Viitso 2003) did not pursue the aim of comparing inter-dialect data. Regarding the relatedness of duration to the manifestations of stress the authors' conclusion was: "The results concerning

stress are the most interesting — perhaps partly so because they are somewhat ambiguous and point toward directions that future research might take. Neither duration nor pitch serve as reliable stress cues” (Lehiste, Aasmäe, Meister, Pajusalu, Teras, Viitso 2003 : 85).

In further research, data of controlled and spontaneous speech were used. The two parts of analyses have produced compatible results. Table 4 (see Aasmäe 2006) shows data of vowel durations measured on samples of spontaneous speech, which also served for the comparison of the assignment of stress in the dialect varieties of Erzya.

Table 4

Erzya dialect groups: data of mean vowel durations (V1, V2, V3), ms, V1/V2) with values of standard deviation in di- and trisyllabic words (stress on first syllable). Significant differences between v1 and v2 are starred: *($p = 0.05$), **($p = 0.01$), *($p = 0.001$)**

Series: disyllabic		trisyllabic							
Dialect group	$n =$	V1 (ms)	V2 (ms)	V1/V2	$n =$	V1 (ms)	V2 (ms)	V3 (ms)	V1/V2
1	107	108.7	109.3	1.0	57	89.8	86.5	90.9	1.1
		15.9	15.6	0.2		17.1	13.3	16.9	0.3
2	93	107.9***	97.4***	1.1	38	97.5***	76.8***	83.1	1.3
		18.9	16.7	0.2		21.8	12.7	23.0	0.3
3	54	121.9**	110.6**	1.2	40	91.7**	75.6**	88.4	1.3
		21.1	27.4	0.3		22.4	19.1	25.7	0.3
4	56	111.6***	94.7***	1.2	30	93.7***	70.3***	82.3	1.4
		22.5	17.0	0.3		20.7	13.7	23.1	0.4

Two types of temporal relationship between stressed and unstressed syllable nuclei have been distinguished for the dialect groups marked in the table as groups 1 to 4 (the total number of informants — 33). In the dialects of group 1 (the prototype of the written language) characterized by alternation in the position of stress and lack of vowel reduction, vowel durations showed no dependence on the position of stress in a word. Stressed and unstressed syllable nuclei tended to be equal. Mean duration ratios V1/V2 for di- and trisyllabic words did not reveal significant differences. Data for dialect groups 2, 3, 4, which are characterized by the dominance of stress on the first syllable and different patterns of vowel reduction, are analogous to the data of Moksha. Stressed syllable vowels were found to be significantly longer than unstressed syllable vowels in both di- and tri-syllabic words. In tri-syllabic words, asymmetry between vowel durations in the stressed and unstressed syllables was greater than in di-syllabic ones.

4. Conclusion

As far as the vowel duration data for stressed and unstressed syllables are concerned, Moksha and Erzya display a continuum of temporal characteristics. On one side are the dialects of Erzya that display no dependence of

vowel durations on the position of stress, on the other side are the sub-dialects of Central Moksha observed here, showing a significant length asymmetry between the vowels of stressed and unstressed syllables. Within this continuum are dialects of Erzya possessing a mixture of characteristics distinguished in the core types of Erzya and Moksha dialects.

Findings presented in this paper attest to some of the well known ideas discussed over time in literature in connection with the features of prosody in the Mordvin languages; at the same time the data are novel as they allow treating the theme in terms of empirical evidence.

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ДЛИТЕЛЬНОСТЬ ГЛАСНЫХ В МОКША-МОРДОВСКОМ ЯЗЫКЕ

В статье представлены результаты анализа длительности гласных в мокшанском языке, которые свидетельствуют о влиянии ударения, открытости/закрытости слога, а также позиции слова в предложении на соотношение между длительностью гласных в слогах слова. Сравнение этих данных с результатами аналогичного исследования, проведенного ранее на материале диалектов эрзянского языка, показывает определенный диапазон количественных характеристик гласных, присущих просодии диалектов эрзянского и мокшанского языков.