FEDOR ROZHANSKIY (Tartu—Moscow)

THE LENGTH OF FINAL VOWELS WITH RESPECT TO CASE SYNCRETISM IN LUUDITSA VOTIC*

Abstract. The paper presents experimental phonetic research on the contemporary Votic language. The data were recorded by the author from the last speakers of the Liivtšüla-Luuditsa variety. The main question addressed in the paper is whether the length of the final vowel distinguishes the case forms that do not have case markers and do not differ through grade alternations. The acoustic analysis has proved that: the vowel length is considerably reduced in non-initial syllables; there is no opposition of the originally long and half-long vowels in the CVCV structure; the final short *-a/-ä* vowels have reduced their quantity and changed their quality, and the reduction of the final short vowels other than *-a/-ä* is only quantitative and not consistent. Based on the experimental results the paper further discusses syncretism in nominal paradigms, possible variants of transcription for the contemporary Liivtšüla-Luuditsa variety, and the dynamics of quantitative and qualitative phonological contrasts in the Votic language.

Keywords: Votic, experimental phonetics, phonology, reduction, case syncretism.

1. Background

The opposition of Votic case forms is provided both by case markers and consonant alternations in the stem. However, not all nouns have alternations in the stem, and four of the grammatical cases — the nominative, genitive, partitive and illative — do not have clearly distinctive case markers in the singular. The nominative does not have a marker in general; the genitive has lost the final *-*n* and presents a bare stem; one of the variants of the partitive marker (*-a/-ä*) merges with the final *a/ä* vowel of the stem; and the illative can have an unmarked short form (except in monosyllabic nouns).[1] As a result, the paradigms of many Votic nouns contain several forms that look very similar. The feature that could distinguish these forms

* The research was supported by the Estonian Research Council grant IUT2-37, and the Russian Foundation for Humanities, project 12-04-00168a.

[1] Monosyllabic nouns have a specific marker of the short illative form: *sō* 'marsh:NOM'— *sohho* 'marsh:ILL', *tū̆* 'work:NOM' — *tühhe* 'work:ILL'. The long Illative form is marked with *-se/-sę*. In Luuditsa Votic, long and short illative forms vary without any evident restrictions. In spontaneous speech, the short form is more frequent.

is the length of the final vowel,[2] but the existing sources on Votic give confusingly varying opinions on this matter.

In the first Votic grammar, written by Ahlqvist (1856 : 32), the nominative singular forms usually end in a short vowel (e.g. *kattila* 'cauldron:NOM', *silta* 'bridge:NOM'), while in the genitive and partitive, the final vowel is long[3] (*kattilā* 'cauldron:GEN', *sillā* 'bridge:GEN'; *kattilā* 'cauldron:PART', *siltā* 'bridge:PART'). The illative forms, which are presented in Ahlqvist (1856) in the long variant (i.e. with the marker -(*s*)*se*) have a long vowel before this marker (*kattilāse* 'cauldron:ILL', *siltāsse* 'bridge:ILL').

The same tendency is found in the grammar by Ariste (1968 : 43): cf. *einä* 'hay:NOM', *einǟ* 'hay:GEN/PART', *einǟ*(*sē*) 'hay:ILL'; *sęna* 'word:NOM', *sęnā* 'word:GEN/PART', *senā*(*sę̄*) 'word:ILL'.

In the dictionary by Tsvetkov (1995), written at the beginning of the 20th century, the nominative has a short final vowel or no final vowel at all, the partitive usually ends in a short vowel (with some exceptions), and the genitive and illative show variation (sometimes rather confusing) in the length of the final vowel between different lexemes: *ein* 'hay:NOM', *einä̆* 'hay:GEN/ILL', *einä* 'hay:PART'; *кала* 'fish:NOM/GEN/PART', *калазę* 'fish:ILL'; *tara* 'garden:NOM/GEN', *tarà* 'garden:PART', *tarasę* 'garden:ILL'; *vasar* 'hammer:NOM', *vasarà* 'hammer:GEN', *vasara* 'hammer:PART', *vasara*(*sę̆*) 'hammer:ILL'.

A grammar by Агранат (2007 : 45) states that the genitive and illative have a prolonged final vowel, the partitive forms with the *-a* marker end in a long vowel (the author gives the example *калаа* 'fish:PART', but elsewhere in the same grammar only the form *калла* is found), and the nominative has a short final vowel.

In Маркус, Рожанский 2011 nouns with stem-final *a*/*ä* have nominative forms ending in a reduced vowel (except for words of CVCV[4] structure, where the final vowel is short but not reduced). The genitive, partitive and illative forms have a short but not reduced final vowel: *tšülä* 'village:NOM/GEN', *tšüllä* 'village:PART/ILL', *seinə* 'wall:NOM', *seinä* 'wall:GEN/PART/ILL'. Nouns with stem-final vowels other than *a*/*ä* have a short final vowel in the nominative, genitive and illative forms: *ohtogo* 'evening:NOM/GEN/ILL' (Маркус, Рожанский 2011 : 277, 285, 295, 320—321).

Viitso's doctoral thesis contains a chapter on phonetics and phonology of the Vaipooli Votic varieties[5] based on data collected in 1958—1961 and

[2] Apart from the vowel length, in Section 5.2 I discuss intensity and formant structure as potential additional cues to the opposition of cases. Hypothetically, there might be some other suprasegmental features that distinguish the case forms under discussion; however, nothing like this was mentioned by previous researchers, and thus the presence of such features is unlikely.

[3] Excluding the partitive forms, which have the marker *-ta* or end in a diphthong formed by the final vowel of the stem and the partitive marker *-ä*/*-a*.

[4] Here and below the following system of symbols is used to describe the phonetic structure of a form: C — consonant, C̄ — geminate, CC or CCC — consonant cluster, V — vowel, V̄ — long vowel, VV — diphthong.

[5] Vaipooli varieties, or the Western Votic dialect, were spoken in Jõgõperä, Liivtšülä, Luuditsa and Rajo villages. Tsvetkov 1995, Агранат 2007 and Маркус, Рожанский 2011 are based on data from this dialect. The grammar (Ahlqvist 1856) uses data from the Kattila variety (Cental Votic dialect). Ariste' grammar (1968) is based on material from the Central Votic dialect (Kattila and neighbouring villages), though some data from the Jõgõperä variety are also presented. For more about the revised system of Votic dialects see Муслимов 2005, Ernits 2005 : 77—79 and Маркус, Рожанский 2011 : 17—19.

1976 (see Вийтсо 1982 : 228—230). It argues that there is an opposition of short and long vowels both in initial and non-initial syllables, but notes that in words with a long first syllable the non-initial long vowel is usually pronounced as half-long. The research also states that Votic short vowels in the second syllable become half-short or quantitatively and qualitatively reduced after a long initial syllable.[6]

One may try to explain such variation in interpretations by dialectal features, recent changes in phonetics and correspondingly morphology, peculiarities of the transcription, and other reasons. In most cases verification of the data is impossible or highly problematic (there are no recordings from the 19th century, and recordings from the first half of the 20th century are of poor quality). However, the recent data presented in Агранат 2007 and Маркус, Рожанский 2011 can be verified.

It should be noted that until recently there were no experimental phonetic studies based on the Votic material. The only exception is the paper by Ariste (1942), where he measured the length of segments in some words. The research was based on the data recorded in 1934 from a Votic male speaker (the Central Votic dialect, Pummala village). The main results concerning the length of vowels in non-initial syllables are (Ariste 1942 : 45—47): a) in disyllabic words with a short initial syllable the second vowel is longer than the first;[7] the vowel of the second syllable is longer in open syllables than in closed (the average length is 146.9 ms[8] and 106.2 ms, respectively); b) the vowel in the second syllable is shorter if the initial syllable is long (the average length is 104.6 ms); the second syllable vowel is shorter after a long vowel or diphthong in the initial syllable than after a combination of a short vowel and a consonant; c) non-initial syllables can contain long vowels; in disyllabic words the average length of a second syllable long vowel is 197.5 ms; d) short vowels in word-final position can be longer than short vowels in the initial syllable; in words like *siga* the second vowel is actually half-long; e) the average length of short final vowels in tri-syllabic words is 78.9 ms. I will compare Ariste's results with my own in Section 5.6.

The main aim of my research is to determine whether the length of the final vowel distinguishes the case forms of nouns in contemporary Votic, and if it does, what is the correlation between the length and the case form. The research deals also with a morphological problem, namely the syncretism in Votic nominal paradigms. I will analyse four case forms that

[6] Reduction is not a recent phenomenon in the westernmost Votic varieties. Mustonen (1883 : 165) already described the reduction of the final vowel in fast speech as a specific feature of these varieties that makes them similar to Estonian and southern Finnic dialects. He also noted that unlike in the Kattila variety, there is no lengthening of the final vowel in the genitive form in Jõgõperä and Luuditsa. However, Mustonen's transcription of Luuditsa texts does not suggest definite conclusion on the degree of reduction and on the comparative length of vowels in different forms. Along with homonymous forms *vana* 'old:NOM' and *vana* 'old:GEN' that fully correspond to the contemporary pronunciation, we find, for example, identical forms like *Jumala* 'God:NOM' and *Jumala* 'God:GEN'. If such forms had been truly homonymous in the end of the 19th century, they could not have given different reflexes (*Jumalə* vs *Jumala*) in the contemporary language.

[7] It is not clear why *leḑhgon* 'I chop' is listed among words of this type.

[8] Ariste (1942) indicated the length of segments in hundredths of a second, but for this paper all the data were converted into milliseconds.

are most inclined to merge: the nominative, genitive, partitive and illative singular.[9]

The paper is organized as follows. Section 2 describes the experiments. In Section 3 nouns with stems ending in *a*/*ä* are analysed. Section 4 presents a similar analysis for nouns with other stem-final vowels. Section 5 discusses quantitative and qualitative differences of forms, syncretism of cases, specific characteristics of the illative, foot isochrony and the impact of the research results on the transcriptional conventions. Section 6 contains general conclusions.

2. Data and methods

The material used in the paper was recorded from three speakers of Luuditsa Votic[10] in 2011—2013: a male born in 1928 (Speaker 1); a female born in 1928 (Speaker 2) and a male born in 1921 (Speaker 3). The first two speakers were born in the Liivtšülä village (which is currently a part of Luuditsa). The Liivtšülä variety possibly had slightly less Ingrian influence than the proper Luuditsa variety. Speaker 3 was born in Luuditsa. After World War II he lived mostly in St. Petersburg but visited his native village regularly.

The age of the native speakers affects their ability to work as informants, and consequently there was no possibility to conduct a comprehensive phonetic investigation of different vowels in various types of nouns. Thus, the object of research was significantly limited.

1. Only nouns without grade alternations were analysed (grade alternation distinguishes the genitive from other cases: *poiga*?*ā*[11] 'boy:GEN' — *poika*?*ā* 'boy:PART/ILL').
2. A significant part of the research considers nouns with stem-final *a*/*ä* (Section 3), because other stem-final vowels do not merge with the partitive marker (*-a*/*-ä*), cf. *калла*?*ā* 'fish:PART/ILL', but *pöllüä* 'dust:PART' — *pöllü*?*ӣ* 'dust:ILL'. However, a number of nouns with other stem-final vowels are also analysed in the paper as they seem not to oppose the nominative to the other forms via the qualitative reduction (*лелло*?*ō* 'toy:NOM/GEN/ILL', but *виллə* 'wool:NOM' — *вилла*?*ā* 'wool:GEN/PART/ILL').
3. Only several morphophonological structures were analysed. For the nouns with stem-final *a*/*ä* there are four disyllabic structures and one trisyllabic: CVCV (type *кала-*[12] 'fish'), CVCCV (type *нагла-* 'nail'), CVVCV (type *лаiva-* 'ship'), CVCV (type *pīmä-* 'milk') and CVCVCV (type *vasara-* 'hammer').[13] For the nouns with stem-final vowels other than *a*/*ä* the analysed structures were: CVCV (type *тало-* 'house'), CV$\bar{C}$V (type *pöllü-* 'dust'), CVVCV (type *kaivo-* 'well'), CVCCCV (type *kirstu-* 'chest') and CVCVCV (type *pikari-*

[9] There are other examples of syncretism in Luuditsa Votic: merging of the allative and adessive singular and the homonymy of the genitive and illative plural. As these cases do not involve the problem of vowel length directly, they are not discussed in this paper.

[10] This variety belongs to the Western Votic dialect.

[11] Here and below the question mark is used to denote the ambiguous length of the final vowel.

[12] I name the structures according to the vocalic stem of a noun.

[13] I assume that if a polysyllabic word distinguishes some phonetic opposition, this opposition should also exist in disyllabic words while the opposite is not true: an opposition existing in dissyllabic words is not necessarily present in words consisting of more than two syllables.

'shot glass'). There is some difference between the sets of structures for *a/ä* and non *a/ä* words, because for some structures it was problematic to find words with the target final vowel that were known by the speakers.

The questionnaire with the test words for recording was composed in the following way:
(a) it consisted of simple sentences in Russian to be translated into Votic by native speakers;
(b) the test words were always in the sentence final position;
(c) each sentence provided a context that unambiguously defined the case of the noun: for example, *This is a big fish* (NOM), *He ate one fish* (GEN), *I do not have fish* (PART), *Add some salt to the fish* (ILL). An agreeing adjective with clearly distinguished case forms was an additional key that guaranteed that there was no confusion of forms.[14] Cf. *sē on s ū r kaлa?ā* 'This is a big:NOM fish:NOM' — *miä sein s ū r ę kaлa?ā* 'I ate a big:GEN fish:GEN'.

The generally accepted methodology of phonetic experiments recommends recording several pronunciations of every sentence/word. My experience shows that old people often forget to repeat the sentence, and if the researcher keeps on demanding such repetition, the repeated sentence will be pronounced too fast or, inversely, in an unnatural manner.[15] Thus, if the speaker did not repeat the sentence, it appeared more productive to change the context in a way that did not affect the test words, e.g. *I ate one fish — He ate one fish — We ate one fish*, etc. In this case, the speech tempo and naturalness were preserved.

The recordings were made with an Edirol R-09HR digital recorder and a stereo microphone (Edirol CS-15 or Sony ECM-MS907) at a 16 bit 48000 Hz sampling rate. More than 1500 pronunciations were segmented and analysed in Praat (Boersma, Weenink 2014).

3. Nouns with stem-final *a/ä*

This section presents the results of acoustic measurements for several types of word structures. Five subsections correspond to the five analysed structures. Each subsection contains two tables and a figure.

Tables 1, 3, 5, 7 and 9 show the average length (Average), standard deviations (StDev) of the segments in the foot, and the number of tokens (N). The last two lines give:
a) the overall average, i.e. (Average (Speaker 1) + Average (Speaker 2) + Average (Speaker 3)) / 3;
b) standard deviation of averages, i.e. StDev (Average (Speaker 1), Average (Speaker 2), Average (Speaker 3)).

Figures 1—5 compare the average length of the final vowel in each case form for every speaker.

Tables 2, 4, 6, 8 and 10 present the results of a statistical analysis testing the effect of the case form on the length of the final vowel. The single-factor ANOVA was calculated for every possible pair of case forms (i.e. nominative vs genitive, nominative vs partitive, genitive vs partitive, etc.). The tables are divided into two parts. The left part (separated with a bold

[14] Mistakes in agreement are very rare in the speech of the Votic speakers and do not appear in such simple constructions.
[15] See discussion of this problem in Chelliah, de Reuse 2011 : 255.

line) contains pairs of case forms with the same segmental structure. It means that the length of the final vowel might be the only feature that distinguishes the two forms in a pair. The right part of every table contains pairs of case forms that have other differences (the quality of the final vowel or the gemination of the second consonant), and therefore the length of the final vowel cannot be the only feature distinguishing the forms in a pair. Every cell in a table shows the statistical significance of the difference between the two case forms: "+++" stands for $p < 0.001$ (very significant), "+" stands for $p < 0.01$ (significant), "+?" for $0.01 \le p \le 0.05$ (possibly significant; the exact p-value is given in parentheses), and "—" for $p > 0.05$ (not significant).

A short discussion of the results of the measurements is given in each subsection after the tables.

3.1. Structure CVCV (type *кала-*)

In this structure, the nominative and the genitive forms have the same CVCV structure (*кала*ʔ*ā* 'fish:NOM/GEN'), while the partitive and illative forms both have a geminated second consonant (*калла*ʔ*ā* 'fish:PART/ILL').

Table 1

The average length and standard deviation (in ms) of segments (CVCV type)

		NOM			GEN			PART			ILL		
		V_1	C	V_2	V_1	C	V_2	V_1	C	V_2	V_1	C	V_2
Speaker 1	Average	**93**	**65**	**132**	**85**	**65**	**124**	**108**	**200**	**117**	**103**	**193**	**110**
	StDev	21	15	16	18	17	18	13	31	25	12	22	19
	N	30			24			26			17		
Speaker 2	Average	**73**	**74**	**143**	**78**	**70**	**131**	**85**	**213**	**123**	**78**	**176**	**98**
	StDev	16	16	23	18	17	32	24	41	29	16	33	17
	N	30			28			28			15		
Speaker 3	Average	**103**	**74**	**177**	**102**	**79**	**166**	**122**	**227**	**144**	**106**	**225**	**165**
	StDev	23	10	39	15	14	20	37	42	29	13	45	36
	N	16			10			25			16		
All	Average	**90**	**71**	**151**	**88**	**71**	**140**	**105**	**213**	**128**	**96**	**198**	**124**
	StDev	15	5	23	12	7	23	19	14	14	15	25	36

Table 2

The statistical significance of V2 variation between case forms (CVCV type)

	NOM-GEN	PART-ILL	NOM-PART	NOM-ILL	GEN-PART	GEN-ILL
Sp1	–	–	+	+++	–	+? (p = 0.023)
Sp2	–	+	+	+++	–	+++
Sp3	–	+? (p = 0.048)	+	–	+? (p = 0.034)	–

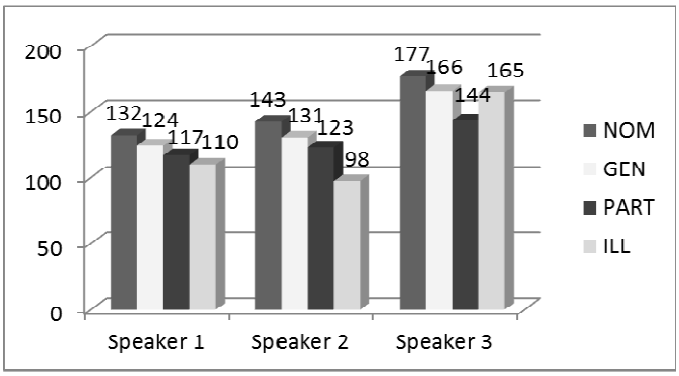

Figure 1
The average length of V2 (in ms) in nouns of the CVCV type.

Several observations can be made on the basis of the data from Table 1 and Table 2.
1. The average length of the final vowel decreases in the direction NOM > GEN > PART > ILL (the only exception is the illative form from Speaker 3).
2. There is no statistically significant difference between the length of final vowels (V2) in the nominative and genitive forms.
3. There is no statistically significant difference between the length of V2 in the partitive and illative for Speakers 1, but for Speaker 2 the final vowel in the illative is significantly shorter than in the partitive. Speaker 3 (unlike two other speakers) has a longer V2 in the illative (statistically, this difference is possibly significant).
4. The length of the final vowel demonstrates a significant difference between the nominative and partitive (for all speakers) and between the nominative and illative (for Speakers 1 and 2).
5. The length of the final vowel in the genitive and partitive is not significantly different for Speakers 1 and 2 and is possibly significant for Speaker 3. This means that the length of V2 does not depend crucially on the structure of the form (CVCV vs CV̄CV).[16]
6. The difference between the length of V2 in the genitive and illative forms depends on the speaker: there is no statistically significant difference for Speaker 3, a very significant difference for Speaker 2 and a possibly significant difference for Speaker 1.
7. V1 and C are always shorter in the illative than in the partitive (for all speakers).
8. Speaker 3 has longer vowels than Speakers 1 and 2. This tendency is general (i.e. it concerns nouns of all structures) so I will not mention it in further discussion.
9. The illative form shows the strongest divergence in the length of the final vowel between the speakers.

3.2. Structure CVCCV (type *nagла-*)

In this structure, the nominative form differs from the three other forms in the quality of the final vowel: *nagлə* 'nail:NOM' vs *nagла*?*ā* 'nail:GEN/PART/ILL'.[17]

[16] In the neighbouring Ingrian language the situation is completely different (see Markus 2011).
[17] The same applies to all other structures analysed in sections 3.3—3.5.

Table 3

The average length and standard deviation (in ms) of segments (CVCCV type)

		NOM			GEN			PART			ILL		
		V_1	CC	V_2	V_1	CC	V_2	V_1	CC	V_2	V_1	CC	V_2
Speaker 1	Average	**95**	**198**	**65**	**99**	**197**	**113**	**97**	**182**	**120**	**93**	**160**	**119**
	StDev	17	23	18	24	30	16	21	27	20	12	23	17
	N	17			20			18			40		
Speaker 2	Average	**96**	**194**	**71**	**83**	**183**	**119**	**86**	**182**	**115**	**81**	**157**	**105**
	StDev	17	29	16	14	28	24	18	29	22	17	24	18
	N	18			18			21			19		
Speaker 3	Average	**151**	**222**	**95**	**113**	**221**	**131**	**125**	**201**	**156**	**121**	**227**	**146**
	StDev	44	31	31	19	36	26	33	39	30	29	27	23
	N	18			8			18			11		
All	Average	**114**	**205**	**77**	**98**	**200**	**121**	**103**	**188**	**130**	**98**	**181**	**123**
	StDev	32	15	16	15	19	9	20	11	22	21	40	21

Table 4

The statistical significance of V2 variation between case forms (CVCCV type)

	GEN-PART	PART-ILL	GEN-ILL	NOM-GEN	NOM-PART	NOM-ILL
Sp1	–	–	–	+++	+++	+++
Sp2	–	–	–	+++	+++	+++
Sp3	–	–	–	+	+++	+++

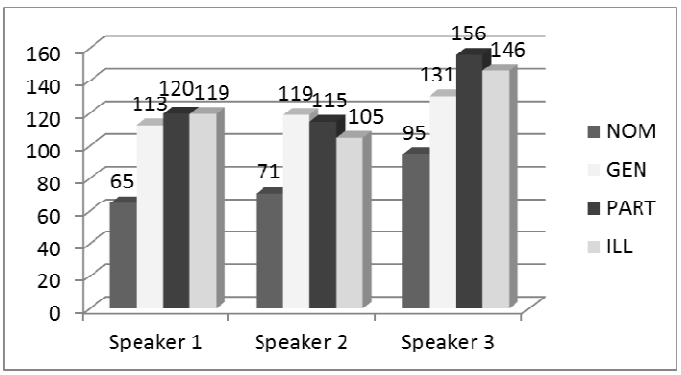

Figure 2

The average length of V2 (in ms) in nouns of the CVCCV type.

1. Here, unlike in the CVCV structures, V2 in the nominative forms is considerably shorter than in all other case forms.
2. There is no statistically significant difference between the lengths of final vowels in case forms other than the nominative.
3. In the illative, Speakers 1 and 2 have shorter V1 and CC than in other cases. This difference is very significant for CC ($p < 0.001$), but not for V1.

It is worth mentioning that the length of V2 in the partitive and illative forms of the *nagла-* type is rather close to the length of V2 in the partitive and illative forms of the *kала-* type (i.e. the forms with the CVC̄V structure). For the genitive forms (that have very different structures: CVCV in the *kала-* type vs CVCCV in the *nagла-* type) the results depend on the speaker: there is a statistically significant difference for Speaker 3 (166 vs 131 ms, $p < 0.01$), possibly significant difference for Speaker 1 (124 vs 113 ms, $p = 0.036$) and no difference for Speaker 2 (131 vs 119 ms, $p > 0.05$). Cf. also section 5.5 on foot isochrony.

3.3. Structure CVVCV (type *лаiva-*)

In this structure the first vowel is a diphthong. All the test words in the dataset contain diphthongs ending in *i*. Other types of diphthongs can be slightly longer, so I did not use them in the experiments in order not to increase the degree of variation in the length of the initial vowels.

Table 5

The average length and standard deviation (in ms) of segments (CVVCV type)

		NOM			GEN			PART			ILL		
		V_1	C	V_2	V_1	C	V_2	V_1	C	V_2	V_1	C	V_2
Speaker 1	Average	**202**	**76**	**56**	**195**	**79**	**116**	**190**	**80**	**113**	**183**	**78**	**111**
	StDev	24	11	18	28	11	27	39	16	20	19	13	21
	N	16			16			21			20		
Speaker 2	Average	**202**	**83**	**73**	**179**	**77**	**107**	**185**	**88**	**123**	**170**	**80**	**110**
	StDev	40	14	13	30	19	27	37	13	17	23	17	27
	N	15			13			22			29		
Speaker 3	Average	**310**	**118**	**101**	**237**	**97**	**147**	**248**	**91**	**150**	**275**	**97**	**218**
	StDev	26	26	18	30	27	30	43	19	32	45	15	37
		10			10			14			9		
All	Average	**238**	**92**	**77**	**204**	**84**	**123**	**208**	**86**	**129**	**209**	**85**	**146**
	StDev	62	23	23	30	11	21	35	6	19	57	10	62

Table 6

The statistical significance of V2 variation between case forms (CVVCV type)

	GEN-PART	PART-ILL	GEN-ILL	NOM-GEN	NOM-PART	NOM-ILL
Sp1	–	–	–	+++	+++	+++
Sp2	+? (p = 0.043)	+? (p = 0.043)	–	+++	+++	+++
Sp3	–	+++	+++	+++	+++	+++

1. In this structure the final vowel in the nominative is again significantly shorter than in other cases.

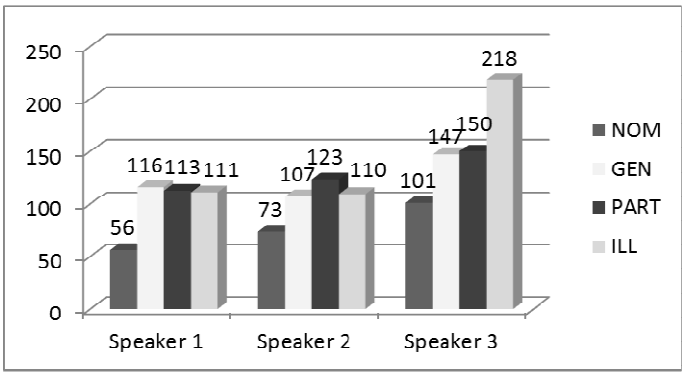

Figure 3
The average length of V2 (in ms) in nouns of the CVVCV type.

2. The length of the final vowel in other cases depends on the speaker. Speaker 1 has almost the same length of V2 in the genitive, partitive and illative forms. Speaker 2 has a longer V2 in the partitive, which has a possibly significant difference from V2 in the genitive and illative. For Speaker 3, V2 in the illative is significantly longer than in the genitive and partitive.
3. The diphthong is always longer in the nominative than in other case forms. For Speakers 1 and 2 this difference is statistically significant only between V1 in the nominative and illative (202 vs 183 ms, $p = 0.012$; 202 vs 170 ms, $p < 0.01$). For Speaker 3, a significant difference is observed between V1 in the nominative and genitive/partitive forms (310 vs 237 ms, $p < 0.001$ for the NOM-GEN pair; 310 vs 248 ms, $p < 0.01$ for the NOM-PART pair).[18]
4. There is no noticeable shortening of V1 or C in the illative forms of all speakers.

3.4. Structure CV̄CV (type *pīmä-*)

Table 7
The average length and standard deviation (in ms) of segments (CV̄CV type)

		NOM			GEN			PART			ILL		
		V_1	C	V_2	V_1	C	V_2	V_1	C	V_2	V_1	C	V_2
Speaker 1	Average	**164**	**72**	**72**	**156**	**82**	**118**	**150**	**71**	**119**	**142**	**72**	**121**
	StDev	21	12	17	24	14	14	17	17	18	25	8	16
	N	19			15			14			14		
Speaker 2	Average	**169**	**90**	**75**	**139**	**85**	**126**	**138**	**84**	**119**	**116**	**74**	**108**
	StDev	27	17	16	21	20	24	31	9	23	17	12	20
	N	16			16			14			15		
Speaker 3	Average	**266**	**99**	**117**	**209**	**87**	**183**	**241**	**98**	**186**	**237**	**99**	**205**
	StDev	46	13	17	55	9	35	62	19	42	32	13	23
	N	8			9			15			9		
All	Average	**200**	**87**	**88**	**168**	**85**	**142**	**176**	**84**	**141**	**165**	**82**	**145**
	StDev	58	14	25	37	3	35	56	14	39	64	15	53

[18] See section 5.5 for the additional analysis of V1 length.

Table 8

The statistical significance of V2 variation between case forms (CV̄CV type)

	GEN-PART	PART-ILL	GEN-ILL	NOM-GEN	NOM-PART	NOM-ILL
Sp1	–	–	–	+++	+++	+++
Sp2	–	–	+? (p = 0.035)	+++	+++	+++
Sp3	–	–	–	+++	+++	+++

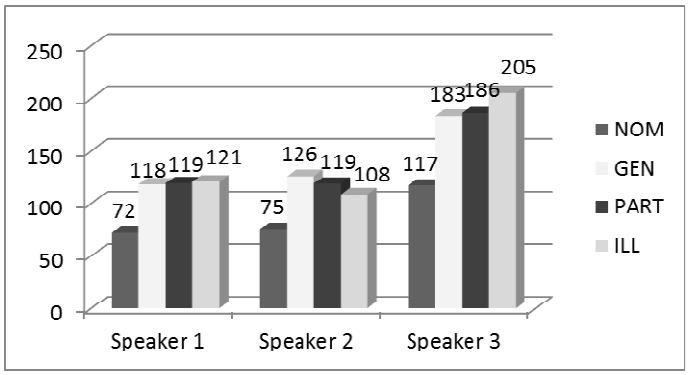

Figure 4
The average length of V2 (in ms) in nouns of the CVCV type.

1. In this structure the final vowel in the nominative is also significantly shorter is than in other cases.
2. The final vowels in other cases do not demonstrate any significant difference in their length. The only exception is the possibly significant difference between V2 in the genitive and illative for Speaker 2, as there is a shortening of the vowel in the illative.
3. In the illative forms of Speaker 2 there is also a shortening of V1 and C. They are significantly shorter than those in the nominative ($p < 0.001$ and $p < 0.01$ correspondingly). The difference with the partitive is possibly significant ($p = 0.026$ and $p = 0.020$ correspondingly) and the difference with the genitive is significant only for V1 ($p < 0.01$).

3.5. Structure CVCVCV (type *vasara-*)

1. In trisyllabic words the final vowel in the nominative is shorter than in other cases, and this difference is always highly significant ($p < 0.001$).
2. The difference between the final vowels in other case forms depends on the speaker. For Speaker 1, there is no statistically significant difference. For Speaker 2, there is a statistically significant difference between the genitive and illative and a possibly significant difference between the partitive and illative (due to the shorter vowel in the illative). For Speaker 3, there is a possibly significant difference between the partitive and illative (due to the longer vowel in the illative).
3. The penultimate vowel in the nominative is always longer than in other forms. However, only for Speaker 2 is this difference statistically significant.
4. The final vowel in the nominative is always shorter in this trisyllabic structure than it is in disyllabic structures discussed above.

Table 9

The average length and standard deviation (in ms) of segments (CVCVCV type)

		NOM			GEN			PART			ILL		
		V_2	C	V_3	V_2	C	V_3	V_2	C	V_3	V_2	C	V_3
Speaker 1	Average	**104**	**76**	**54**	**95**	**77**	**104**	**92**	**77**	**111**	**95**	**84**	**103**
	StDev	16	13	12	12	9	14	11	10	17	8	14	17
	N	16			14			15			11		
Speaker 2	Average	**95**	**80**	**62**	**83**	**83**	**107**	**78**	**80**	**105**	**74**	**76**	**94**
	StDev	12	10	15	9	15	14	12	14	14	10	10	14
	N	18			18			20			21		
Speaker 3	Average	**144**	**98**	**89**	**122**	**115**	**159**	**134**	**121**	**174**	**112**	**102**	**183**
	StDev	35	30	15	9	35	20	16	11	19	21	15	7
	N	14			7			7			5		
All	Average	**114**	**85**	**68**	**100**	**92**	**123**	**101**	**93**	**130**	**94**	**87**	**126**
	StDev	26	12	18	20	20	31	29	25	38	19	13	49

Table 10

The statistical significance of V3 variation between case forms (CVCVCV type)

	GEN-PART	PART-ILL	GEN-ILL	NOM-GEN	NOM-PART	NOM-ILL
Sp1	–	–	–	+++	+++	+++
Sp2	–	+? (p = 0.014)	+	+++	+++	+++
Sp3	–	–	+? (p = 0.031)	+++	+++	+++

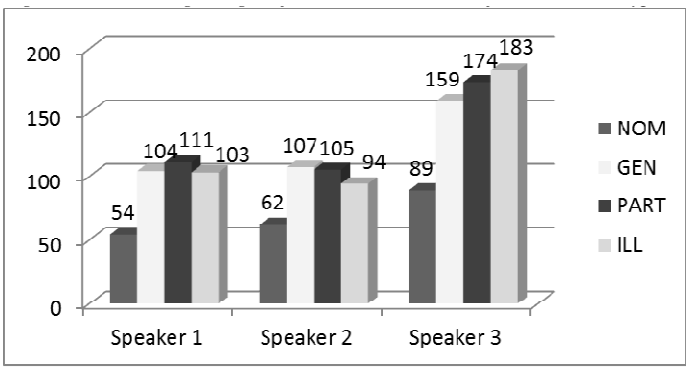

Figure 5
The average length of V3 (in ms) in nouns of the CVCVCV type.

3.6. Nouns with stem-final *a/ä*: summary

For nouns with stem-final *a/ä* the main results of the analysis are the following: 1. There is a reduction of the final vowel in the nominative forms in all structures except CVCV, and this reduction is not only qualitative (see

Section 5.2) but also quantitative: the difference in the length is always statistically significant.
2. In CVCV structure, there is no opposition of a prolonged (half-long) vowel in the nominative and originally long vowels in other case forms.
3. There is individual variation in the system of oppositions of case forms that depends both on the structure and the particular speaker. Such variations are not typical for Speaker 1 but are very common for Speaker 2 (she opposes the partitive vs illative in the *кала-* type and the genitive vs illative in the *vasara-* type, and possibly distinguishes the partitive from genitive and illative in the *лаiva-* type, genitive from illative in the *pīmä-* type and the partitive from illative in the *vasara-* type). The "purest" type, which does not display variation between speakers, is the *нагла-* type. Speaker 3 has less individual variation than Speaker 2.
4. Speaker 3 has a slower speech rate, so in his data all segments are longer. Thus, the comparison of absolute lengths of the final vowels between Speaker 3 and other speakers is not very informative.
5. Apart from CVCV, the analysed structures do not demonstrate a consistent correlation between the structure and the length of the final vowel. The only exception is the CV̄CV structure of Speaker 3, where the final vowel is in most cases longer than in other structures. But even with this structure there is no consistency: the illative in CVVCV is longer than in CV̄CV.

4. Nouns with stem-final vowels other than *a/ä*

In this section nouns with the stem ending in a vowel other than *a/ä* are analysed. This study is preliminary as the length of the vowel can depend on its quality, and nouns that differ either by the structure or by the quality of the stem-final vowel should be analysed separately. However, it is impossible to find Votic nouns with all stem-final vowels for every structure that do not have degree alternations and are present in the limited vocabulary of contemporary native speakers. Thus, in the current paper only several types of nouns were analysed. These types are listed in Table 11. One of the types (*pöllü-*) combines nouns with different stem vowels (*ü* and *o*), while others are homogeneous from the point of view of the final vowel quality. Types *kaivo-* and *kirstu-* contain only one lexeme (i.e. many pronunciations of the same word were recorded).

Table 11

Types of analyzed nouns ending in a vowel other than *a/ä*

Type	Structure	Stem vowel
тало- 'house'	CVCV	*o*
pöllü- 'dust'	CV̄CV	*ü/o*
kaivo- 'well'	CVVCV	*o*
kirstu- 'chest'	CVCCCV	*u*
pikari- 'shot glass'	CVCVCV	*i*

These data were collected from two speakers (Speaker 1 and Speaker 2). As was mentioned in Section 2, nouns with a stem-final vowel other than *a/ä* always distinguish the partitive singular from other case forms (the partitive marker *a/ä* forms a diphthong with the stem vowel, e.g. *pöllüä* 'dust:PART', *kaivoa* 'well:PART'). Thus, only three case forms are considered in this section: the nominative, genitive and illative singular.

The data are presented in the same way as in Section 3: Tables 12, 14, 16, 18 and 20 show the average length and standard deviation of the segments; Figures 6, 7, 8, 9 and 10 compare the average length of the final vowels; Tables 13, 15, 17, 19 and 20 present the results of the statistical analysis.

4.1. Structure CVCV (type *тало-*)

In this structure, the illative form differs from the two others in the gemination of the second consonant: *тало*?*ō* 'house:NOM/GEN' vs *талло*?*ō* 'house:ILL'.

Table 12

The average length and standard deviation (in ms) of segments (CVCV type)

		NOM			GEN			ILL		
		V_1	C	V_2	V_1	C	V_2	V_1	$\bar{C}$	V_2
Speaker 1	Average	**94**	**76**	**129**	**81**	**73**	**123**	**94**	**197**	**109**
	StDev	29	19	23	17	13	19	17	32	20
	N	24			21			22		
Speaker 2	Average	**79**	**72**	**129**	**74**	**71**	**116**	**69**	**219**	**95**
	StDev	23	12	22	20	16	27	14	51	22
	N	24			24			23		
All	Average	**87**	**74**	**129**	**78**	**72**	**120**	**82**	**208**	**102**
	StDev	11	3	0	5	1	5	18	16	10

Table 13

The statistical significance of V2 variation between case forms (CVCV type)

	NOM-GEN	NOM-ILL	GEN-ILL
Sp1	–	+	+? (p = 0.026)
Sp2	–	+++	+

It is easy to notice that the main tendencies found for the CVCV type of nouns with the stem-final *a/ä* (Section 3.1) are also valid for the *тало-* type:

— there is a decrease of V2 length in the direction NOM > GEN > ILL;
— there is no statistically significant difference between the length of V2 in the nominative and genitive;
— for both speakers there is a statistically significant difference between the length of V2 in the nominative and illative (which are structurally different due to gemination in the illative).
— the difference between the length of V2 in the genitive and illative is possibly significant for Speaker 1 and significant for Speaker 2.

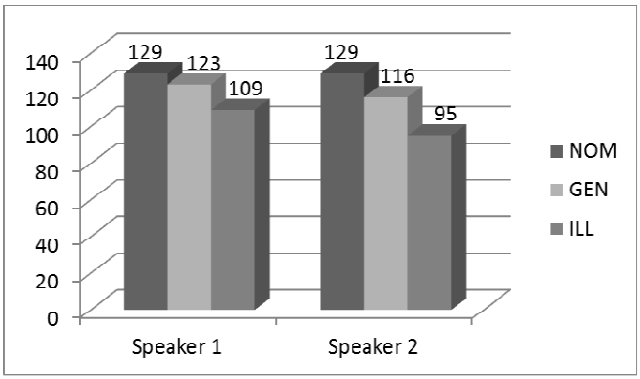

Figure 6
The average length of V2 (in ms) in nouns of the CVCV type.

4.2. Structure CVC̄V (type *pöllü-*)

Unlike the *тало-* type, this and the following types (sections 4.3.—4.5.) have the same structure in the nominative, genitive and partitive: *pöllü*?*ǖ* 'dust:NOM/GEN/ILL'.

Table 14
The average length and standard deviation (in ms) of segments (CVC̄V type)

		NOM			GEN			ILL		
		V_1	C̄	V_2	V_1	C̄	V_2	V_1	C̄	V_2
Speaker 1	Average	**100**	**194**	**80**	**103**	**181**	**115**	**97**	**188**	**111**
	StDev	10	15	15	21	16	11	17	16	17
	N	17			14			15		
Speaker 2	Average	**87**	**186**	**76**	**77**	**163**	**105**	**81**	**158**	**111**
	StDev	18	39	21	13	19	9	15	30	19
	N	18			14			14		
All	Average	**94**	**190**	**78**	**90**	**172**	**110**	**89**	**173**	**111**
	StDev	9	6	3	18	13	7	11	21	0

Table 15
The statistical significance of V2 variation between case forms (CVC̄V type)

	NOM-GEN	NOM-ILL	GEN-ILL
Sp1	+++	+++	–
Sp2	+++	+++	–

1. It can be clearly seen that the length of the final vowel in the nominative is significantly smaller than that in the genitive and illative. The average length of the V2 in the nominative is practically the same as in the *нагла-* type (Section 3.2) for Speaker 2 (76 ms vs 71 ms), while Speaker 1 has a longer vowel in the *pöllü-* type (80 ms vs 65 ms). Thus, the presence of the final vowel reduction in the nominative is certain, but the degree of this reduction can vary.

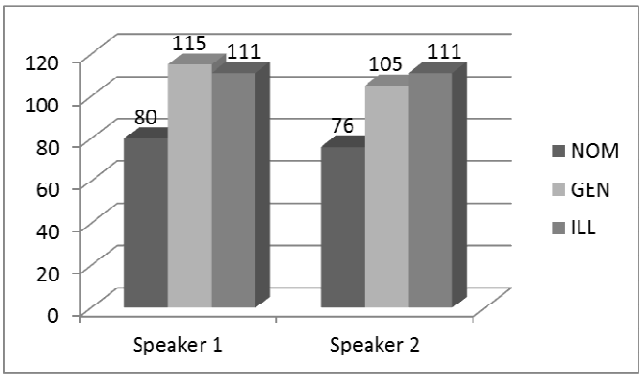

Figure 7
The average length of V2 (in ms) in nouns of the CVC̄V type.

2. Final vowels in the genitive and illative do not demonstrate any significant differences in length.
3. There is no shortening of V1 or C̄ in the illative (unlike in the *нагла*-type).
4. In the illative forms, the geminate is much shorter for Speaker 2 than for Speaker 1, and Speaker 2 has a considerable variation in the length of the geminate.
5. The geminate in the nominative is longer than in the genitive or illative. This difference is possibly significant for Speaker 2 but for Speaker 1 a possibly significant difference is attested only between the nominative and genitive.

4.3. Structure CVVCV (type *kaivo*-)

Table 16
The average length and standard deviation (in ms) of segments (CVVCV type)

		NOM			GEN			ILL		
		V_1	C	V_2	V_1	C	V_2	V_1	CC	V_2
Speaker 1	Average	**187**	**67**	**96**	**172**	**84**	**111**	**173**	**65**	**105**
	StDev	16	12	15	13	9	12	11	9	7
	N	16			16			12		
Speaker 2	Average	**168**	**70**	**77**	**154**	**68**	**111**	**146**	**69**	**99**
	StDev	19	12	7	20	9	20	25	8	14
	N	18			15			16		
All	Average	**178**	**69**	**87**	**163**	**76**	**111**	**160**	**67**	**102**
	StDev	13	2	13	13	11	0	19	3	4

Table 17
The statistical significance of V2 variation between case forms (CVVCV type)

	NOM-GEN	NOM-ILL	GEN-ILL
Sp1	+	–	–
Sp2	+++	+++	–

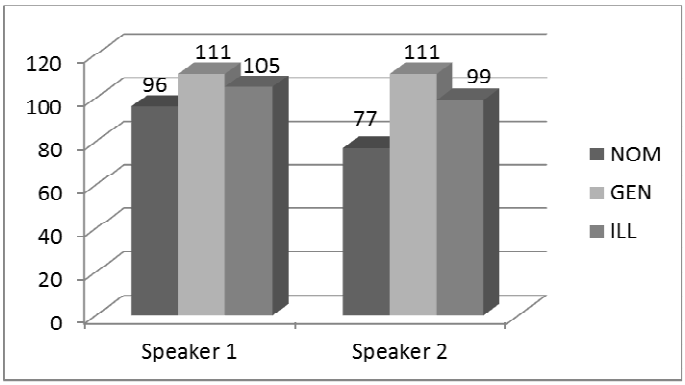

Figure 8
The average length of V2 (in ms) in nouns of the CVVCV type.

1. In this type Speaker 2 has an obvious reduction of the final vowel in the nominative. However, for Speaker 1 this reduction is not so evident. The difference is significant between the nominative and genitive, but not between the nominative and illative. The average length of V2 in the nominative is much bigger in this type than in the *лаiva-* type (96 ms vs 56 ms).
2. For both speakers, there is no statistically significant difference between the length of V2 in the genitive and illative.

4.4. Structure CVCCCV (type *kirstu-*)

Table 18
The average length and standard deviation (in ms) of segments (CVCCCV type)

		NOM			GEN			ILL		
		V_1	C	V_2	V_1	C	V_2	V_1	CC	V_2
Speaker 1	Average	**77**	**298**	**79**	**66**	**281**	**88**	**68**	**289**	**92**
	StDev	15	22	26	7	15	14	7	17	14
	N	12			14			12		
Speaker 2	Average	**69**	**288**	**62**	**59**	**259**	**97**	**56**	**250**	**94**
	StDev	15	38	11	10	35	18	12	26	16
	N	17			17			17		
All	Average	**73**	**293**	**71**	**63**	**270**	**93**	**62**	**270**	**93**
	StDev	6	7	12	5	16	6	8	28	1

Table 19
The statistical significance of V2 variation between case forms (CVCCCV type)

	NOM-GEN	NOM-ILL	GEN-ILL
Sp1	–	–	–
Sp2	+++	+++	–

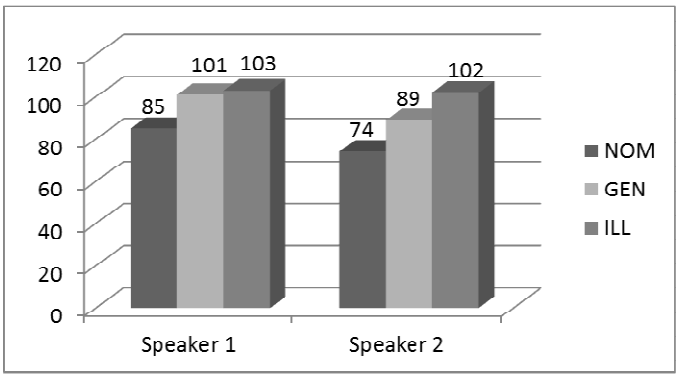

Figure 9
The average length of V2 (in ms) in nouns of the CVCCCV type.

1. Speaker 2 has a reduced final vowel in the nominative. Although Speaker 1 also has a shorter vowel in the nominative compared to the other cases, this difference is very small and is not statistically significant. The length of V2 in the nominative (Speaker 2) is not very stable (the standard deviation is 26 ms).
2. For both speakers there is no significant difference between the length of final vowels in the genitive and illative.

4.5. Structure CVCVCV (type *pikari-*)

Table 20
The average length and standard deviation (in ms) of segments (CVCVCV type)

		NOM			GEN			ILL		
		V_2	C	V_3	V_2	C	V_3	V_2	CC	V_3
Speaker 1	Average	**84**	**87**	**85**	**77**	**89**	**101**	**83**	**87**	**103**
	StDev	11	14	17	14	18	15	10	10	17
	N	18			15			20		
Speaker 2	Average	**79**	**83**	**74**	**68**	**83**	**89**	**81**	**87**	**102**
	StDev	17	19	12	16	19	22	14	11	20
	N	28			21			28		
All	Average	**82**	**85**	**80**	**73**	**86**	**95**	**82**	**87**	**103**
	StDev	4	3	8	6	4	8	1	0	1

Table 21
The statistical significance of V2 variation between case forms (CVCVCV type)

	NOM-GEN	NOM-ILL	GEN-ILL
Sp1	+	+	–
Sp2	+	+++	+? (p = 0.033)

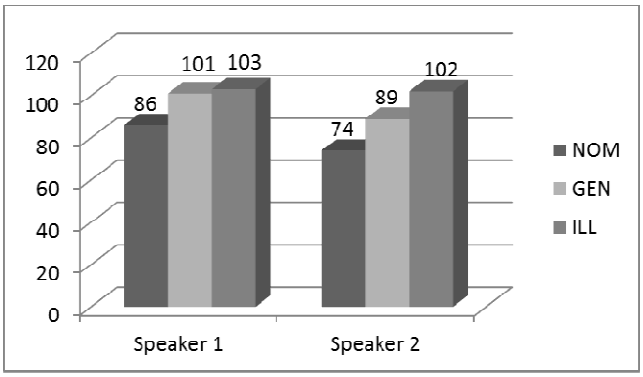

Figure 10
The average length of V2 (in ms) in nouns of the CVCVCV type.

1. The final vowel in the nominative is shorter than in the genitive and illative. This difference is statistically significant but only marginally: for Speaker 1 it is 16 ms (nominative vs genitive) and 18 ms (nominative vs illative), for Speaker 2 it is 15 ms (nominative vs genitive) and 28 ms (nominative vs illative).
2. There is no significant difference between the lengths of V3 in the genitive and illative for Speaker 1, while for Speaker 2 this difference is possibly significant (the final vowel in the illative is slightly longer than in the genitive).

4.6. Nouns with stem-final vowels other than *a/ä*: summary

In general, both categories of nouns — with stem-final *a/ä* and with other stem-final vowels — demonstrate the same tendency: in the nominative the final vowel is shorter than in other case forms. The exception is the CVCV structure where the distinction between the genitive forms with the originally long vowel and the nominative forms with the originally half-long vowel is completely lost.

However, nouns with stem-final vowels other than *a/ä* have some specific characteristics:
— the reduced vowel in the nominative is longer than *ə* (a detailed discussion follows in Section 5.1);
— often the difference between the reduced and non-reduced vowels is small (CVCVCV structure), vague (Speaker 1, CVVCV structure) or even lost (Speaker 1, CVCCCV structure);
— there is no obvious correlation between the structure and the length of the final vowel (apart from CVCV).

Summing up, I can say that in nouns with stem-final vowels other than *a/ä* the reduction of final vowels in the nominative is not fully consistent. This might reflect the tendency to avoid the distinction between reduced and full vowels, as is observed in the Jõgõperä variety of Votic, see Kuznetsova, Fedotov 2013.

5. Discussion

5.1. Reduction of final vowels: a quantitative aspect

Figure 11 presents the comparative length of the final vowel in the nominative for all analysed structures, and Table 22 compares the length of the final vowel in the nominative, genitive and illative forms in same three structures (CVCV, CVVCV and CVCVCV) for *a*/*ä* and *non-a*/*ä* stems. The rightmost part of the table shows the difference between each value of *a*/*ä* stem and a corresponding value of *non-a*/*ä* stem (a negative value means that the final vowel in the *non-a*/*ä* stem is longer than that in the *a*/*ä* stem).

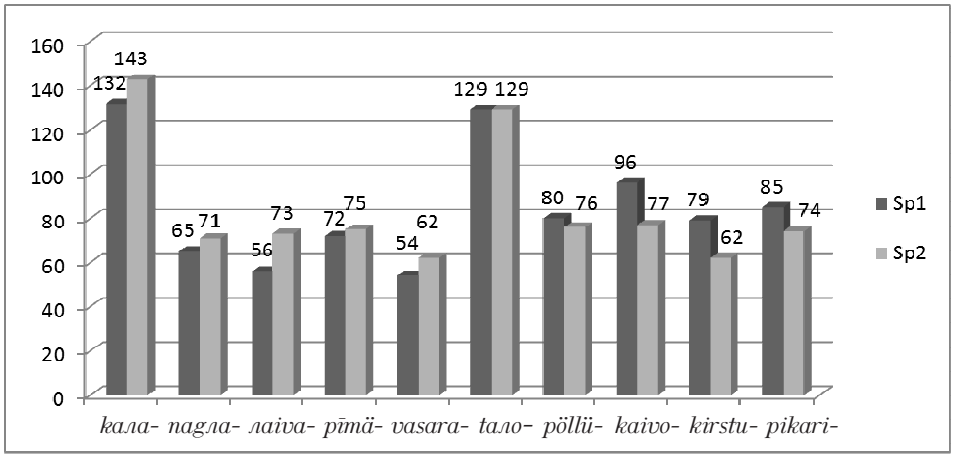

Figure 11. **The length of the final vowel in nouns of different structures in the nominative.**

Table 22

Nouns with *a*/*ä* stem and with non-*a*/*ä* stem: comparison of the final vowel length

Structure		*a*/*ä* stem			non-*a*/*ä* stem			Difference		
		NOM	GEN	ILL	NOM	GEN	ILL	NOM	GEN	ILL
CVCV	Speaker 1	132	124	110	129	123	109	3	1	1
	Speaker 2	143	131	98	129	116	95	14	15	3
	Average	**138**	**128**	**104**	**129**	**120**	**102**	**9**	**8**	**2**
CVVCV	Speaker 1	56	116	111	96	111	105	-40	5	6
	Speaker 2	73	107	110	77	114	99	-4	-7	11
	Average	**65**	**112**	**111**	**87**	**113**	**102**	**-22**	**-1**	**9**
CVCVCV	Speaker 1	54	104	103	85	101	103	-31	3	0
	Speaker 2	62	107	94	74	89	102	-12	18	-8
	Average	**58**	**106**	**99**	**80**	**95**	**103**	**-22**	**11**	**-4**

As mentioned above, the tendency to reduce the final vowel in the nominative forms is observed in both *a*/*ä* and non-*a*/*ä* stems. However,

Figure 11 and Table 22 show that the length of the final vowel is different in these two stem types: the reduction in *a/ä* stems is greater than in non-*a/ä* stems (cf. the nominatives of the CVVCV and CVCVCV structures in Table 22). There is also a difference between the speakers: Speaker 1 demonstrates a bigger reduction in *a/ä* stems than Speaker 2, but in non-*a/ä* stems the situation is the opposite.

Thus, two main parameters that influence the degree of length reduction in the nominative are the quality of the final vowel (*a/ä* or non-*a/ä* stem) and the speaker. The structure of the word also plays a part, but its influence is not crucial (excluding the CVCV structure where the reduction does not happen). Speaker 1 is slightly more sensitive to the structure of the word than Speaker 2.

5.2. Reduction of final vowels: a qualitative aspect

Although the analysis presented in this paper is mainly aimed at the quantitative characteristics of vowels in four case forms, the distinctions of cases are not necessarily based on the quantity of the final vowel only.

For this reason I give a brief overview of the qualitative characteristics of final vowels in Votic: the intensity and formant structure. My main findings in this field are the following.

1. In the nominative forms, the reduced final vowel that originates from *a* is qualitatively different from *a*.

Table 23 compares the first three formants[19] of four groups of sounds:
- *a* in the initial syllable (i.e. a short stressed vowel);
- *a* in the second syllable of the genitive form (i.e. originally a long unstressed vowel);
- *a* in the second syllable of the nominative form in CVCV nouns (i.e. originally a half-long unstressed vowel)
- *ə* in the second syllable of the nominative form in non-CVCV nouns (i.e. originally a short unstressed vowel).

Only back-vocalic nouns were used in the experiment. All data were recorded from Speaker 1.

Table 23

Formant structure of *a* and *ə* vowels

Vowel	Example	N		F1	F2	F3
a in 1st syllable	*vasarə*	165	Average	**632**	**1219**	**2480**
			StDev	46	115	138
a in 2nd syllable, GEN, non-CVCV, final position	*лaiva*	17	Average	**628**	**1173**	**2487**
			StDev	64	76	127
a in 2nd syllable, NOM, CVCV, final position	*kaлa*	23	Average	**657**	**1156**	**2472**
			StDev	25	93	131
ə in 2nd syllable, NOM, non-CVCV, final position	*лaivə*	13	Average	**507**	**1232**	**2479**
			StDev	80	189	158

[19] The formant values were measured in the middle of the vowel duration.

The only statistically significant difference observed in these data is the difference between F1 of *ə* and of all other groups ($p < 0.001$). There is no statistically significant difference either between any formants of the first three groups or between F2 and F3 of *ə* and of other groups.

F1 of *ə* is lower than that of *a*, i.e. *ə* is a more closed vowel than *a*.

Table 23 also shows that *ə* demonstrates a bigger standard deviation of formant values (especially for F2) than *a*. It means that *ə* has a less stable quality than *a*.

2. Vowels other than *a*/*ä* do not demonstrate any evident differences in the formant values between the nominative and other case forms. As a test experiment I analysed the formant structure of two vowels in different positions: (a) *o* in the second open syllable (e.g. *kaivo* 'well:GEN/ILL' vs *kaivŏ* 'well:NOM') and (b) *i* in the third open syllable (e.g. *pikari* 'shot glass:GEN/ILL' vs *pikarĭ* 'shot glass:NOM'). The data for Speaker 1 are presented in Table 24. No statistically significant difference between the vowel formant values in the nominative form (originally short; subjected to reduction) and those in the genitive or illative form (originally long; not subjected to reduction) was found.[20]

Table 24

Formant structure of *o* and *i* vowels in different positions

Vowel	Example	N		F1	F2	F3
i in the 3rd syllable (GEN or ILL)	*pikari*	35	Average	**302**	**1881**	**2649**
			StDev	33	154	203
i in the 3rd syllable (NOM)	*pikarĭ*	18	Average	**321**	**1856**	**2569**
			StDev	37	97	114
o in the 2nd syllable (GEN or ILL)	*kaivo*	29	Average	**471**	**909**	**2608**
			StDev	40	126	154
o in the 2nd syllable (NOM)	*kaivŏ*	20	Average	**475**	**894**	**2516**
			StDev	41	95	114

3. Another characteristic that hypothetically might be important for distinguishing reduced and non-reduced vowels is intensity. It should be noted that analysing intensity is more complicated if compared with the formant structure or length, because intensity depends both on the vowel quality and the pronunciation (a louder or quieter pronunciation will crucially affect the intensity value). For that reason I calculated the ratio "Mean intensity of the final vowel / Mean intensity of the previous vowel * 100" in several pronunciations of the same form. Table 25 lists intensity values for the nominative, genitive and illative forms of several words (data for Speaker 2). The last two columns present the results of the statistical analysis testing the difference in the intensity values between the nominative and genitive forms and the nominative and illative forms.

[20] It should be mentioned that a recent experimental study (Brodskaya 2014) based on my Votic dataset showed a significant difference in the quality of long and short *i* in the initial syllable.

Table 25

The relative intensity of the final vowel in different case forms

Form	Gloss		NOM	GEN	ILL	NOM-GEN	NOM-ILL
erne	pea	Average	**89.59**	**91.71**	**93.88**	–	+
		StDev	2.85	4.69	1.06		
		N	9	5	7		
kirstu	chest	Average	**82.59**	**90.05**	**90.45**	+?	+
		StDev	8.09	3.60	3.31		
		N	12	9	12		
pöllü	dust	Average	**87.47**	**92.22**	**91.58**	+	+?
		StDev	3.96	2.98	3.47		
		N	11	9	10		
kaivo	well	Average	**89.79**	**95.05**	**92.16**	–	–
		StDev	6.10	4.79	2.62		
		N	8	5	5		
paperi	paper	Average	**94.12**	**91.33**	**93.30**	–	–
		StDev	2.10	3.18	2.59		
		N	5	9	7		
pikari	shot glass	Average	**93.66**	**91.84**	**91.15**	–	–
		StDev	5.40	2.68	2.64		
		N	10	5	11		
vagoni	coach	Average	**89.42**	**92.24**	**92.84**	–	–
		StDev	6.28	4.20	3.58		
		N	9	5	10		

As the data in Table 25 show:

— three words demonstrate statistically significant difference between the intensity values, while four words do not;[21]
— the difference is blurred, i.e. the p-value is never less than 0.001 and sometimes one pair of case forms has the difference while the other does not;
— in some words the nominative form has a less intensive final vowel than the genitive and illative forms, but in some words it does not;
— the standard deviation of intensity values is usually higher in the nominative than in other forms.

From these results I conclude that intensity is an accessory but by no means the main feature that distinguishes reduced and non-reduced vowels in Votic.

[21] I do not have enough data to define why the last four words do not demonstrate the difference. It is not clear whether there is a correlation with the structure or with the quality of the final vowel (three of four words are trisyllabic with stem-final *i*) or whether it is just a coincidence.

5.3. Case syncretism

The data discussed above allow us to draw a picture of case syncretism in contemporary Votic.[22] The nominative, genitive, partitive and short illative singular can differ from each other through one of the following features:
— variation of vocalic vs consonant stems;
— consonant gradation in the vocalic stem;
— gemination in the vocalic stem;
— affixation (that distinguishes the partitive forms of nouns with non *ä*/*a* stems)[23];
— alternation of the stem-final *i* ~ *e*/*ę*.

Tables 26 and 27 list noun classes that are distinguished on the basis of these features. Every class is a unique combination of the features and corresponds to one line in the tables. Table 26 contains single-stem nouns (that do not have forms with the consonant stem) and Table 27 contains two-stem nouns (that have both vocalic and consonant stems). Combinations that are theoretically possible but not presented in our corpus of data are shaded grey. For every class of nouns homonymous forms are marked with an asterisk (if there are two homonymous pairs of forms in a class, they are marked with one and two asterisks correspondingly). If there are no asterisks in a row, it means that there are no homonymous forms in the class. As the reduction of stem-final vowels other than *a*/*ä* is not fully stable and sometimes there is no distinction of full and reduced vowels (see Section 4.6), I marked potentially syncretic forms with (*).[24]

Table 26

Syncretism of cases in single-stem words

Stem-final vowel	Consonant gradation	Secondary geminates	Example	NOM	GEN	PART	ILL
a/*ä*	–	–	*seinə* 'wall'		*	*	*
	–	+	*kaʌa* 'fish'	*	*	**	**
	+	–	*poikə* 'boy'			*	*
	+	+	*pata* 'pot'			*	*
non-*a*/*ä*	–	–	*kaivŏ* 'well'	(*)	*		*
	–	+	*taʌo* 'house'	*	*		
	+	–	*tüttŏ* 'girl'	(*)			(*)
	+	+	*koto* 'house, home'				

[22] As already mentioned, I analyse only the nominative, genitive, partitive and short illative singular.
[23] I do not discuss monosyllabic nouns here: cf. *ma* 'land:NOM/GEN', *mātə* 'land:PART' and *mahha* 'land:ILL'.
[24] It means that such forms would coincide with some other forms of the same noun, if the distinction between the reduced and full vowel (other than *a*/*ä*) was lost.

Table 27

Syncretism of cases in two-stem words

Type of stem in the nominative	Consonant gradation	Secondary geminates	Alternation *i ~ e/ę*	Example	NOM	GEN	PART	ILL
vocalic	–	–	–	*erne* 'pea'	(*)	*		*
vocalic	–	–	+	*tšēlĭ* 'language'		*		*
vocalic	–	+	–	*pere* 'family'	*	*		
vocalic	–	+	+	*meri* 'sea'				
vocalic	+	–	–					
vocalic	+	–	+	*irsĭ* 'log'				
vocalic	+	+	–					
vocalic	+	+	+	*tšäsi* 'hand'				
consonant	–	–	N/A	*ʌammęz* 'sheep'		*		*
consonant	–	+	N/A	*mēz* 'man'				
consonant	+	–	N/A	*jänez* 'hare'				
consonant	+	+	N/A					

As seen from Tables 26 and 27, 6 out of 8 classes of single-stem nouns and 4 out of 9 (or out of 12 theoretically possible) classes of two-stem nouns contain syncretic forms. Hence, Luuditsa Votic has a highly developed syncretism of case forms. It is obviously more pervasive than in Southern Estonian (Grünthal 2010 : 102), and is more or less comparable with Standard Estonian (Grünthal 2001). It is worth mentioning that the neighbouring Jõgõperä variety of Votic has a different system of syncretism. In Jõgõperä Votic, there is no reduction in the nominative forms of nouns ending in a vowel other than *a/ä* (i.e. types *erne-* and *kaivo-* have no difference between the nominative and genitive). On the other hand, our Jõgõperä speakers do not usually use short illative forms, so the illative does not merge with any other case forms, and this significantly decreases the degree of syncretism.

5.4. Illative

In this section I will briefly discuss specific behaviour of the illative forms.

As seen from Tables 26 and 27 a short illative takes part in syncretism more often than other case forms. In three classes of nouns the illative coincides with the partitive, in four classes with the genitive and in one class with both of them.

My measurements show much diversity in the behaviour of the illative form. Here I briefly repeat the findings about the illative mentioned above:

Type *кала-*: V1 and C are shorter in the illative than in the partitive (for all three speakers). This difference is not statistically significant.

The final vowel in the illative is shorter than in the genitive (it is statistically significant for Speaker 2 and possibly significant for Speaker 1).

Type *нагла-*: V1 and CC are shorter in the illative than in the nominative, genitive and partitive (for Speakers 1 and 2 but not 3). This difference is statistically significant for CC ($p < 0.001$).

Type *лaiva-*: For Speaker 3 the final vowel in the illative is much longer than in all other case forms.

Type *pīmä-*: V1 and C are shorter in the illative than in the nominative, genitive and partitive (for Speaker 2 but not for Speakers 1 and 3). Sometimes this difference is significant (V1 in the nominative and genitive, C in the nominative), sometimes possibly significant (V1 and C in the partitive), and sometimes not significant (C in the genitive).

The final vowel in the illative is shorter than in the genitive (Speaker 2). This difference is possibly significant.

Type *vasara-*: For Speaker 2 the final vowel in the illative is shorter than in the genitive (statistically significant) or the partitive (possibly significant). For Speaker 3 the final vowel in the illative is longer than in the genitive (possibly significant) and the partitive (not significant).

Type *ŧaлo-*: The final vowel in the illative is shorter than in the nominative and genitive (Speakers 1 and 2). This difference is statistically significant (for the nominative of both speakers and the genitive of Speaker 2) or possibly significant (for the genitive of Speaker 1).

Type *kaivo-*: The final vowel in the illative is shorter than in the genitive for both Speakers (this difference is not statistically significant).

Type *pikari-*: For Speaker 2 the final vowel in the illative is longer than in the genitive. This difference is possibly significant.

The resulting picture is rather difficult to interpret from the phonological point of view. On the one hand, there are too many deviations to be ignored. On the other hand, there is no consistency in these deviations, so the whole picture is rather blurred.

Still, several generalizations can be made.

The tendency to shorten some segments in the illative forms was observed for Speakers 1 and 2 but not for Speaker 3. There is possibly a correlation between this fact and the fact that in my corpus there are both short and long illative forms recorded from Speakers 1 and 2 but only short illative forms recorded from Speaker 3. It is likely that for Speakers 1 and 2 the short illative form is a shortened long form, i.e. it is a result of dropping the final *-sę/-se* marker. The average length of the stem-final vowel in long illative forms is 85 ms (standard deviation — 13 ms) for Speaker 1 and 77 ms (standard deviation = 12 ms) for Speaker 2. It means that this vowel is definitely short, unlike in the examples from Ariste 1968 where this vowel is always long.

Speaker 3 does not use long illative forms, and probably for him the short illative form is not a result of the shortening. I would rather suspect an Ingrian influence here: in Ingrian the short form is the main form[25] of the illative. This hypothesis is supported by the fact that Speaker 3 was born in the Luuditsa village while Speakers 1 and 2 were born in Liivtšülä (as mentioned above, the Ingrian influence was stronger in Luuditsa than in Liivtšülä). However, this hypothesis can explain only the shorter length of the final vowel but not that of the other segments in illative forms.

Another hypothesis concerning the illative is that the language is developing a mechanism to avoid too much syncretism in case forms. As was mentioned in Section 5.3, in many classes of nouns short illative forms coincide with some other case form. In such a situation an attempt to distinguish the short illative from other forms does not look surprising. If this

[25] It means that the short illative form is obligatory in most paradigmatic classes.

is the case, the process is in its initial stage, and thus we can observe only some inconsistent variation in the length of different segments.

5.5. Foot isochrony

The described variation in the illative obscures the question about foot isochrony in contemporary Votic. The CVCV words should be the most illustrative in this respect. They have a single consonant in the nominative and genitive and a geminate in the partitive and illative, so if the length of the final vowel is the same in all these forms, it means that there is no foot isochrony; but if the final vowel in the partitive and illative is shorter, one may speak about a tendency towards foot isochrony.

However, the data are contradictory: the *кала-* type does not demonstrate a statistically significant difference between the length of V2 in the genitive and partitive. Judging by this data, the foot is not isochronic. However, the difference between the length of V2 in the genitive and illative is statistically significant (Table 2).

In the *тало-* type (Table 13), the data show significant (Speaker 1) and possibly significant (Speaker 2) differences between the genitive and illative, while the partitive form cannot be compared as it has a final diphthong.

There are two possible interpretations of this situation:
a) there is a tendency towards foot isochrony in contemporary Votic but the partitive form is abnormal for some unknown reason (so the final vowel in the partitive is longer than it should be), or
b) there is no foot isochrony and the shorter final vowel is a specific feature of the illative forms.

In the structures other than CVCV foot isochrony can be manifested by the changes in the length of other segments: the penultimate vowel and/or the consonant. Since in the nominative the final vowel is shorter than in other case forms, we can expect that the preceding consonant and/or penultimate vowel are longer. The data show that there is no consistent lengthening of the consonant in the nominative vs other cases, but the situation with the penultimate vowel is rather tricky. Table 28 presents the difference between the lengths of this vowel in the nominative and other case forms (a positive value means that in the nominative the vowel is longer) and indicates its statistical significance.

It is clearly seen that in most cases (excluding the *кала-* type) the difference is positive. This means that the nominative has a longer penultimate vowel than the genitive, partitive or illative, and this shows a tendency towards foot isochrony. The negative values for the *кала-* type (where the final vowel in the nominative is longer than in other case forms) indicate the same tendency.[27] On the other hand, in most cases the difference is not statistically significant or just possibly significant. Pairs where the penultimate vowel is significantly longer in the nominative than in other cases are rare and specific for a particular speaker (e.g. types *pīmä-* and *vasara-* for Speaker 2). From that point of view, foot isochrony is more typical for Speaker 2 and less typical for Speaker 1. It also seems that disyllabic nouns that have a long vowel or a diphthong in the initial syllable demonstrate a higher tendency towards foot isochrony than other types.

[26] It is interesting that unlike in the *кала-* type there are no negative values in the *тало-* type.

However, the general picture is the same as shown by the length of final vowels in CVCV words (cf. the beginning of this section): there are only vague traces of foot isochrony in contemporary Votic.

Table 28

Difference in the length of penultimate vowel between the nominative and other case forms

Type	Speaker	Δ V NOM-GEN	Statistical signific.	Δ V NOM-PART	Statistical signific.	Δ V NOM-ILL	Statistical signific.
кала-	Sp1	**8**	–	**-15**	+	**-10**	+
	Sp2	**-5**	–	**-12**	p = 0.037	**-5**	–
	Sp3	**1**	–	**-19**	–	**-3**	–
нагла-	Sp1	**-4**	–	**-2**	–	**2**	–
	Sp2	**13**	p = 0.022	**10**	–	**15**	p = 0.015
	Sp3	**38**	p = 0.028	**26**	p = 0.049	**30**	–
лаiva-	Sp1	**7**	–	**12**	–	**19**	p = 0.012
	Sp2	**23**	–	**17**	–	**32**	+
	Sp3	**73**	+++	**62**	+	**35**	–
pīmä-	Sp1	**8**	–	**14**	–	**22**	p = 0.011
	Sp2	**30**	+	**31**	+	**53**	+++
	Sp3	**57**	p = 0.035	**25**	–	**29**	–
vasara-	Sp1	**9**	–	**12**	p = 0.019	**9**	–
	Sp2	**12**	**+**	**17**	+++	**21**	+++
	Sp3	**22**	–	**10**	–	**32**	–
тало-	Sp1	**13**	–			**0**	–
	Sp2	**5**	–			**10**	–
pöllü-	Sp1	**-3**	–			**3**	–
	Sp2	**10**	–			**6**	–
kaivo-	Sp1	**15**	p = 0.011			**14**	p = 0.023
	Sp2	**14**	p = 0.043			**24**	+
kirstu-	Sp1	**11**	p = 0.021			**9**	-
	Sp2	**10**	p = 0.036			**13**	p = 0.011
pikari-	Sp1	**7**	–			**1**	-
	Sp2	**11**	p = 0.024			**-2**	–

5.6. Transcription and orthography

The phonetic phenomena discussed above are tightly connected with the question of transcription and orthography.[27]

[27] I am grateful to Heinike Heinsoo for inspiring discussions on Votic orthography.

It is evident that the contemporary Votic language is different from the language described in Ariste (1968) (due to both dialectal variation and innovations). This poses a problem for the researchers used to the "classic" Votic transcription (i.e. as in Ariste's grammar), because this transcription does not suit the contemporary data very well.

Figure 12 plots the range of vowel lengths[28] depending on the position of the vowel (stressed in the initial syllable vs non-stressed final), the structure of the noun (CVCV or not) and the original length of the vowel (short vs long). The duration range (from the minimum to the maximum length) is indicated for six types of vowels:

— long stressed vowel of the initial syllable (e.g. *līvə* < *līva* 'sand:NOM');
— short stressed vowel of the initial syllable (e.g. *kaлa* < *kaлà* 'fish:NOM');
— originally long non-stressed vowel in the final position (e.g. *лaiva* < *лaivā* 'ship:GEN');
— originally half-long non-stressed vowel in the final position (e.g. *kaлa* < *kaлà* 'fish:NOM');
— originally short non-stressed vowel other than *a/ä* in the final position (e.g. *kaivŏ* < *kaivo* 'well:NOM');
— originally short non-stressed *a/ä* in the final position (e.g. *лaivə* < *лaiva* 'ship:NOM').

The vowels that are long according to Ariste's system of transcription are marked in black, and short vowels are marked in grey. It can be clearly seen that Ariste's system does not suit the contemporary Votic vowels very well. The main problem is that in the final position the originally half-long vowel has practically the same length as the originally long vowel.[29]

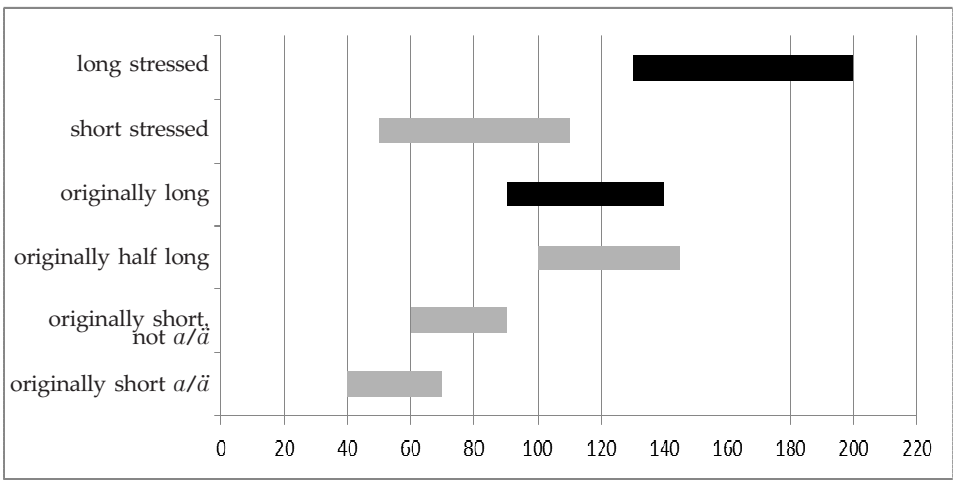

Figure 12. **Length of vowels (in ms) in different positions.**

I propose two variants by which one might adapt Ariste's system to contemporary Votic data. The first is to introduce the long final vowel instead

[28] In Figure 12 I used data from Speakers 1 and 2 for the reason mentioned in (4) in Section 3.6.

[29] This process is not unique to Votic. In neighbouring Soikkola Ingrian we observe a similar tendency, or even to a greater extent — the originally long vowels became shorter than the originally half-long vowels (Markus 2011 : 110).

of the originally half-long. This means that in words of CVCV structure the final vowel will be long in all four case forms, e.g. *kaлā* 'fish:NOM/GEN' and *kaллā* 'fish:PART/ILL'. This variant has minimal differences from Ariste's system but it has two serious weak points. First, the short *a/ä* in the final syllable has a completely different quality than the short *a/ä* in other positions (see Section 5.2). Second, a long vowel in the initial syllable and a long vowel in the last syllable have crucially different lengths. As a result, a transcription based on such phonological interpretation is not intuitive. It would also not be welcomed by the native speakers with whom I discussed possible variants to the Votic orthography.[30]

The second variant is to replace all the originally long vowels in non-initial syllables with short vowels, and introduce reduced vowels as a new phonological unit that has replaced originally short vowels. A positive side to this variant is that it corresponds to contemporary Votic phonetics much better. However, the phonological system becomes more complicated as a new row of reduced vowels is added.[31]

Table 29 illustrates both proposed variants.

Table 29

Two variants of contemporary Votic phonological transcription

Ariste's Votic		Contemporary Votic, variant 1		Contemporary Votic, variant 2		Gloss
Vowel	Sample	Vowel	Sample	Vowel	Sample	
long (stressed)	*līva*	long	*līva*	long	*līvə*	'sand:NOM'
short (stressed)	*kaла*	short	*kaлā*	short	*kaла*	'fish:NOM'
long final	*лaivā*	long	*лaivā*	short	*лaiva*	'ship:GEN'
half-long final	*kaлà*	long	*kaлā*	short	*kaла*	'fish:NOM'
short final *a/ä*	*лaiva*	short	*лaiva*	reduced	*лaivə*	'ship:NOM'
short final, not *a/ä*	*kaivo*	short	*kaivo*	reduced	*kaivŏ*	'well:NOM'

To make the picture more thorough it is worth comparing contemporary Votic data with experimental data presented in Ariste 1942. Unfortunately these sets of data are not fully comparable, as there are several differences between Ariste's and my experiment. In particular, most of Ariste's samples were recorded as separate words uttered as an answer to a question — in such utterances, it is likely that the absolute length of vowels is longer than if the word were uttered as a part of a sentence. There is also no exact correspondence between the structures analysed in Ariste 1942

[30] It is worth mentioning here an experiment made by Mehmed Muslimov with Lower Luga Ingrian speakers (the shortening of the final vowels in this Ingrian dialect is very similar to Votic). Among several suggested variants to the orthography the variant with long final vowels was completely rejected by the speakers (the only exception was a speaker of the Pärspää variety where the shortening of the final vowels did not take place).

[31] It does not mean that a possible Votic orthography should contain the whole set of the reduced vowels: the orthography can be simpler than the phonological transcription. I will not discuss this question in detail as development of a Votic orthography is a complicated problem that is beyond the scope of the current paper.

and in the current paper. Table 30 compares several nouns that were analysed in Ariste 1942 and sets of nouns with the corresponding structure from contemporary Votic. The length of the final vowel is given in milliseconds (in the contemporary Votic data I give the length separately for every speaker). The third column of the table contains comments concerning the length of the final vowel in contemporary Votic as compared with Ariste's data.

Table 30

Length of the final vowel: comparison of Ariste's and contemporary data

Ariste's data (words)	Contemporary Votic (types of structures)	Comments
χaisu '(bad) smell:NOM': 82.5	*kaivo* (NOM): 96 (Sp1) / 77 (Sp2)	No noticeable difference.
dūχa '(good) smell:NOM': 105	*pīmä* (NOM): 72 (Sp1) / 75 (Sp2) / 117 (Sp3)	Sp1 and Sp2 have shorter vowels, while Sp3 has a longer final vowel.
sika 'pig:NOM': 157.5 *pata* 'pot:NOM': 107.5 ~ 152.5 *d'eda* 'grandfather:NOM': 170 (Average = 146.9)	*kaла* (NOM): 132 (Sp1) / 143 (Sp2) / 177 (Sp3)	No noticeable differences.
mẹrta 'creel:NOM': 125 *tšülmä* 'cold:NOM': 112.5	*nagла* (NOM): 65 (Sp1) / 71 (Sp2) / 95 (Sp3)	Sp1, Sp2 and Sp3 have shorter final vowels, but for Sp3 this difference is rather small.
kakku 'sand:NOM': 102.5	*pöllü* (NOM): 80 (Sp1) / 76 (Sp2)	Sp1 and Sp2 have shorter final vowels.
sigā 'pig:GEN': 225	*kaла* (GEN): 124 (Sp1) / 131 (Sp2) / 166 (Sp3)	Sp1, Sp2 and Sp3 have shorter final vowels.

As seen form Table 30, Speaker 3 does not show any significant differences when compared with Ariste's speaker: the former has slightly longer final vowels in types *pīmä* (NOM) and *kaла* (NOM) but a shorter vowel in *nagла* (NOM). Speaker 1 and Speaker 2 have shorter final vowels than Ariste's speaker in most types (*nagла* (NOM), *pīmä* (NOM), *kaла* (GEN) and *pöllü* (NOM)) though not in types *kaivo* (NOM) and *kaла* (NOM). Thus, in general contemporary Luuditsa Votic demonstrates a stronger quantitative reduction of the short final vowel but with some exceptions.

The strongest difference is found in the genitive forms with a long final vowel. Unfortunately, *siga* is the only such form in Ariste's data and from my point of view it is not enough from which to draw definite conclusions about the length of the long final vowels. There is also a form *metsǟ* 'forest:GEN' in Ariste's data but it is not clear how it should be interpreted: in the test sentences it is presented as a genitive form in the word combination *metsǟ pū* 'forest:GEN tree' (Ariste 1942 : 37) while later Ariste considers a trisyllabic word *metsǟ pū* (Ariste 1942 : 46). In any case the length of *ǟ* in *metsǟ* is significantly shorter than *ā* in *sigā* (165 vs 225 ms).

There is one more example of a genitive form in Ariste's data, *naizikŭ̆o* 'woman:GEN' where the final diphthong length is 102.5 ms. This form was

recorded in the word combination *naizikŭo pǟ* 'woman's head'. According to Ariste's grammar, this form should contain a long final vowel: *naizikō* (compare with *ahvako* 'perch:GEN' (Ariste 1968 : 47)). As Ariste's samples contain also the nominative form of the same word (*naizikko*), it is possible to compare the lengths of the short and long vowels in a trisyllabic structure. The difference is only 20 ms: 102.5 ms in *naizikŭo* 'woman:GEN' and 82.5 ms *in naizikko* 'woman:NOM'.

In any case, Ariste 1942 has too few measurements to draw general conclusions. The example of *pata* 'pot:NOM' where Ariste carried out two experiments and got very different results (107.5 vs 152.5 ms) shows that the variation in the length of the final vowel can be very pronounced.[32]

6. Conclusions

The acoustic analysis of data has shown that contemporary Luuditsa Votic demonstrates a number of differences from the "classic" Votic described by Ariste. The most important difference that concerns not only phonetics but also phonology and morphology is the loss of the distinction between long and half-long vowels (the latter were traditionally considered as phonologically short). As a result the nominative and genitive forms of nouns with the CVCV structure are homonymous, while the partitive and short illative differ from them with respect to the longer consonant (but not the longer final vowel).

In other structures the opposition of long and short vowels is generally preserved but it can be lost in some forms of a particular idiolect. In any case, there are some deviations from the original system:

— in non-initial syllables the long vowels have become significantly shorter, while the decrease in length of short vowels is less consistent;
— originally short *a*/*ä* have changed in both quality and quantity, while other vowels have preserved their quality and decreased in quantity to a lesser extent.

There is a need to adapt the "classic" Votic transcription system to the contemporary data. However, there is no one variant which solves all the issues, because the Votic phonological system is in a state of flux. One of the proposed variants which might enhance the phonological system would be to introduce a number of reduced vowels.

The described changes in the phonetics and phonology also affect Votic morphology, namely the syncretism of cases. Contemporary Votic demonstrates a tendency towards developing more syncretism, which is quite typical for southern Finnic languages.

Address

Fedor Rozhanskiy
University of Tartu and Institute of Linguistics of the Russian Academy of Sciences
E-mail: handarey@yahoo.com

[32] Ariste does not explain the reason for conducting two experiments with *pata* and how these experiments were organized. Usually in each experiment every form was pronounced by the native speaker from 4 to 8 times (Ariste 1942 : 36).

Abbreviations

GEN — genitive, **ILL —** illative, **NOM —** nominative, **PART —** partitive.

REFERENCES

Ahlqvist, A. 1856, Wotisk grammatik jemte språkprof och ordförteckning, Helsingfors (Acta Societatis Scientiarum Fennicae V: I).

Ariste, P. 1942, Vadja häälikute kvantiteedest. — Ariste., P. Katselisfoneetilisi tähelepanekuid, Tartu (Acta Universitatis Tartuensis / Dorpatensis B $L._2$), 36—49.

—— 1968, A Grammar of the Votic Language, Bloomington—The Hague (UAS 68).

Boersma, P., Weenink, D. 2014, Praat: Doing Phonetics by Computer [Computer program]. http://www.praat.org/.

Brodskaya, I. 2014, The Interaction of Vowel Duration with Formant Structure and Pitch in the Votic Language. Term paper. Department of English language and Literature, San Francisco State University.

Chelliah, S. L., de Reuse, W. J. 2011, Handbook of Descriptive Linguistic Fieldwork, Dordrecht—Heidelberg—London—New York.

Ernits, E. 2005, Vadja keele varasemast murdeliigendusest ja hilisemast hääbumisest. — Piirikultuuriq ja -keeleq. Piirikultuurid ja -keeled, Võru (Võru Instituudi toimõndusõq 17), 76—90.

Grünthal, R. 2001, Homonymy and Systemacy in Estonian Inflection. — Keele kannul. Pühendusteos Mati Erelti 60. sünnipäevaks, Tartu (Tartu Ülikooli eesti keele õppetooli toimetised 17), 42—61.

—— 2010, Sijasynkretismi morfologian koetinkivenä. — Journal of Estonian and Finno-Ugric Linguistics 2, 91—113.

Kuznetsova, N., Fedotov M. 2013, Is There a Pure Quantitative Contrast of Non-Initial Vowels in Contemporary Votic? Paper presented at the conference on Finnic minority languages and cultures: "Finnic languages, cultures and genius loci. Dedicated to Tiit-Rein Viitso s 75th birthday." University of Tartu, March 7—8, 2013.

Markus, E. 2011, The Phonetics and Phonology of a Disyllabic Foot in Soikkola Ingrian. — LU XLVII, 103—119.

Mustonen, O. A. F. 1883, Muistoonpanoja Vatjan kielestä. — Virittäjä, kieli- ja kansatieteellisiä lehtiä, Porvoo (Kotikielen Seura I), 144—188.

Tsvetkov, D. 1995, Vatjan kielen Joenperän murteen sanasto. Toimittanut, käänteissanaston ja hakemiston laatinut J. Laakso, Helsinki (LSFU XXV. Kotimaisten kielten tutkimuskeskuksen julkaisuja 79).

Аграна т Т. Б. 2007, Западный диалект водского языка, Москва—Гронинген (Mitteilungen der Societas Uralo-Altaica 26. Einheitliche Beschreibung der Dialekte uralischer Sprachen. Begründet von Klára E. Majtinskaja und Wolfgang Veenker).

Вийтсо Т.-Р. 1982, Основные проблемы фонологической структуры прибалтийско-финских языков и ее истории. Диссертация на соискание ученой степени доктора филологических наук, Таллин.

Маркус Е. Б., Рожанский Ф. И. 2011, Современный водский язык. Тексты и грамматический очерк. Том I. Водские тексты, Санкт-Петербург.

Муслимов, М. З. 2005, Языковые контакты в Западной Ингерманландии (нижнее течение реки Луги). Диссертация на соискание ученой степени кандидата филологических наук, Санкт-Петербург.

Ф. И. РОЖАНСКИЙ (Тарту—Москва)

ДЛИТЕЛЬНОСТЬ КОНЕЧНЫХ ГЛАСНЫХ И ПАДЕЖНЫЙ СИНКРЕТИЗМ В ПЕСОЦКО-ЛУЖИЦКОМ ГОВОРЕ ВОДСКОГО ЯЗЫКА

В статье представлены результаты экспериментального фонетического исследования на материале современного водского языка. Материал был собран автором в процессе полевой работы с последними носителями языка, проживающими в деревне Лужицы Кингисеппского района. Основным вопросом, рассматриваемым в статье, является длительность конечного гласного как потенциальный дистинктивный признак, который различает падежные формы, не имеющие падежных маркеров и образующиеся от одной и той же основы. Результаты эксперимента свидетельствуют о сокращении длительности гласных непервого слога, потере оппозиции между исходно долгими и исходно полудолгими гласными в формах структуры CVCV, наличии качественной и количественной редукции конечного краткого *-a*/*-ä* и непоследовательной количественной редукции прочих кратких гласных. На основе проведенного анализа делаются выводы о синкретизме в именных парадигмах, о возможных подходах к системе транскрипции для современного водского материала и о динамике количественных и качественных фонологических оппозиций в водском языке.