

# Near-merger of vowels in Estonian dialects

Pire Teras

Department of Estonian and Finno-Ugric Languages, University of Tartu

## Abstract

The present article presents a study of the raising of overlong mid vowels in Estonian dialects. Long mid vowels of South Estonian dialects (Mulgi, Tartu and Võru) have split into full-long mid vowels (Q2) and into overlong raised mid vowels (Q3). Raising of mid vowels also characterises West Estonian dialects. The formant values of raised mid vowels of Võru and Mulgi show that they are much higher than mid vowels and very close to high vowels. The degree of raising of mid vowels is not as large in the Western dialect. The raising of overlong mid vowels in South Estonian has led to their near-merger with overlong high vowels.

## Introduction

Labov (1994) has pointed to the raising of long vowels as one of the three general principles of vowel shifting. Raising of vowels can cause a chain shift as it has happened in the history of English, but Labov has maintained that mergers of vowels are much more common in the history of languages than chain shifts (Labov, 1994). In the case of a merger two vowels fall together. Labov (1994) has also described the case of near-merger as a situation where speakers make slight differences in the quality of sounds that the listeners cannot hear.

## Raising of mid vowels in Estonian dialects

Estonian has nine vowels that can have either a short (Q1) or a long quantity degree (Q2 and Q3). It has been suggested, however, that Estonians do not perceive small changes in vowel quality that are related to quantity alternation (Eek, Meister, 1994, 1998). These changes are more noticeable in Estonian dialects.

The changes have occurred mostly in two directions: long and overlong vowels have either become diphthongized, or overlong mid vowels are raised (see Figure 1). The diphthongization of long vowels (with the exception of [i] and [u]) has taken place mainly in the area of North Estonia. Raising can be found mainly in South Estonia, West Estonia, and on the islands. Because of contacts between dialects one can find raising in other areas, too. The more to

the South-East of Estonia, the more extensive is the raising. If [e], [o], and [ø] are raised in all the South Estonian dialects (Mulgi, Tartu and Võru), in the Western, and Insular dialect, then [ɤ] is raised in the Võru and Tartu dialect but only occasionally in the Mulgi dialect (e.g. *keel* [kɛ:ɫ] : *keele* [ke:le] ‘language (sg.n. and sg.g.)’, *kool* [kɔ:ɫ] : *kooli* [ko:li] ‘school (sg.n. and sg.g.)’, *rõõm* [rɤ:m] : *rõõmu* [rɤ:mu] ‘joy (sg.n. and sg.g.)’, *söök* [sy:kʲ] : *söögi* [sø:ki] ‘food (sg.n. and sg.g.)’). Nor are [e] and [o] raised under certain conditions in South Estonian dialects. To avoid merger with raised mid vowels, the high vowels have started to diphthongize in South-East of Estonia: e.g. *piim* [peim] instead of [pi:m] ‘milk’, *suur* [sour] instead of [su:r] ‘big’ etc. (Vaba, 1997).

The raising or diphthongization of long vowels is not a phenomenon characteristic only of Estonian dialects. These changes are characteristic of other languages of the Baltic Sea area, too. (For more see Teras, 2003a.)

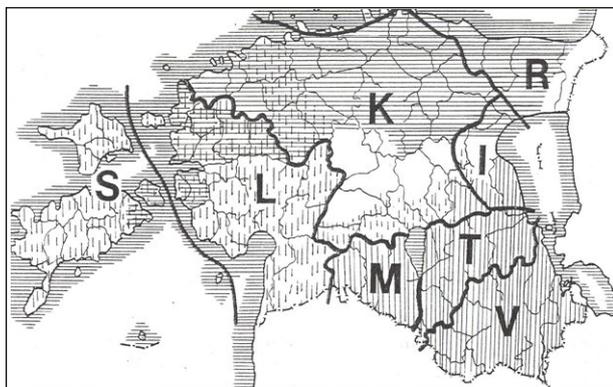


Figure 1. Full-long and overlong mid vowels [e, o, ø] in Estonian dialects (▨ – diphthongization, ▤ – stronger raising, ▥ – weaker raising; North Estonian dialects: K – Mid dialect, I – Eastern dialect, L – Western dialect, S – Insular dialect, R – North-Eastern Coastal dialect; South Estonian dialects: M – Mulgi dialect, T – Tartu dialect, V – Võru dialect).

## Material and Method

Acoustic measurements are based on words that contained mid vowels, raised mid vowels and high vowels (and also low vowels). The words were taken from the recordings of spontaneous speech. The vowels of 4 speakers of Võru were analysed. Here the results of 2 male speakers of

Võru (EK born in 1954 and JP born in 1947) are presented (for more see Teras 2003a, 2001). The words were processed by Kay Elemetrics CSL 4300B. Speech segments were digitized at the sampling rate of 10 kHz. Spectrograms were prepared with the help of a filter with a bandwidth of 293 Hz.

The paper also includes preliminary results about the Mulgi dialect. The spontaneous speech of one male speaker (JV, born in 1885) was analysed using Praat 4.2. Spectrograms were prepared with the help of a filter with a bandwidth of 200 Hz.

Formant frequencies (F1, F2, F3) were measured at the end of the first half of the vowel. The formant values in Herz were converted into Bark (see e.g. Traunmüller, 1990).

Table 2. Average formant values of overlong vowels in Hz and Bark (informant JP).

Vowel (N)	F1		F2		F3	
	Herz	Bark	Herz	Bark	Herz	Bark
ɑ (16)	650	6.14	1164	9.46	2593	14.74
e (7)	392	3.94	1790	12.27	2533	14.58
ē (18)	305	3.08	2134	13.44	2648	14.88
i (15)	269	2.71	2181	13.59	2778	15.19
o (2)	380	3.82	786	7.14	2264	13.84
õ (20)	312	3.15	742	6.83	2296	13.93
u (15)	282	2.84	683	6.40	2237	13.76
ȳ (5)	297	3.53	1281	10.07	2139	13.46
æ (15)	602	5.77	1537	11.25	2498	14.49
ø (23)	306	3.09	1669	11.80	2155	13.51
y (16)	276	2.78	1708	11.95	2157	13.52

## The quality of mid, raised mid and high vowels

### Võru dialect

The average formant values of overlong vowels of two speakers are given in Table 1 and Table 2 (see also Figures 2 and 3 where both full-long (Q2) and overlong (Q3) vowels are presented).

In the speech of both speakers, the overlong raised mid vowel [ē] is slightly lower than the high vowel [i]. In comparison with the full-long and exceptionally overlong mid vowel [e], the overlong vowel [ē] is higher and much more front. In the speech of EK the distance between the F1 of the raised mid vowel and high vowel is 0.33 Bark and between the raised mid vowel and exceptionally overlong mid vowel 0.75 Bark. In the speech of JP the same distances are 0.37 and 0.86 Bark.

Table 1. Average formant values of overlong vowels in Hz and Bark (informant EK).

Vowel (N)	F1		F2		F3	
	Herz	Bark	Herz	Bark	Herz	Bark
ɑ (23)	628	5.98	1261	9.97	2596	14.75
e (10)	453	4.50	1954	12.85	2752	15.13
ē (21)	372	3.75	2168	13.55	2816	15.28
i (16)	339	3.42	2153	13.50	2862	15.38
o (7)	419	4.20	830	7.43	2575	14.63
õ (23)	367	3.70	792	7.19	2073	13.25
u (19)	334	3.37	730	7.28	2031	13.11
ȳ (10)	391	3.93	1514	11.15	2684	14.96
æ (15)	579	5.58	1650	11.72	2643	14.86
ø (19)	369	3.72	1805	12.32	2370	14.14
y (6)	364	3.67	1799	12.30	2403	14.24

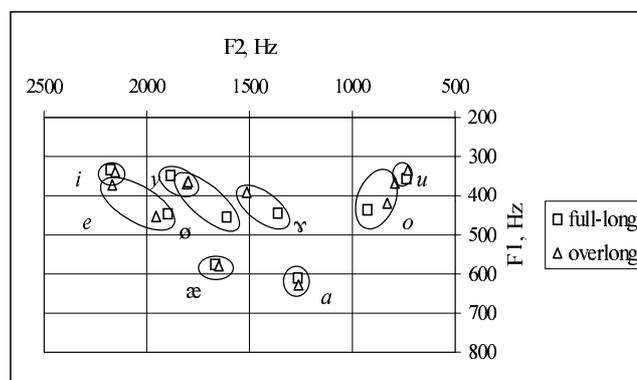


Figure 2. Average formant values of full-long and overlong vowels (speaker EK).

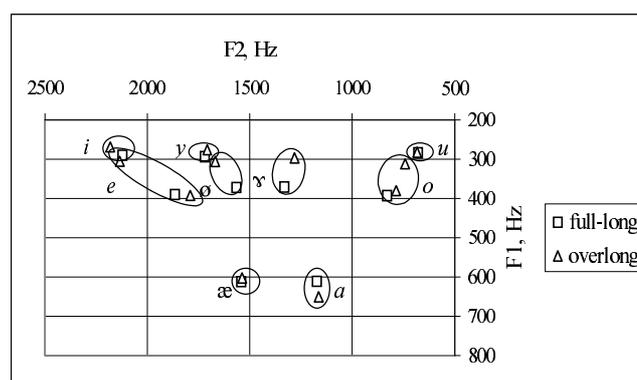


Figure 3. Average formant values of full-long and overlong vowels (speaker JP).

The rounded overlong raised mid vowel [ø] is also slightly lower and more back than the high vowel [y]. In the speech of EK there is actually almost no difference between these two vowels (distance between values of F1 0.05 Bark). In the speech of JP the corresponding distance is 0.31 Bark. At the same time, the raised mid vowel is higher and more front than the full-long mid vowel [ø]. The distance between the

F1 of the raised mid vowel and mid vowel is accordingly 0.79 Bark (speaker EK) and 0.66 Bark (Speaker JP).

The rounded overlong raised mid vowel [ɔ] is lower and more front than the high vowel [u]. In comparison with the full-long and exceptionally overlong mid vowel [o], the overlong raised mid vowel has moved higher and backwards. In the speech of EK the distance between the F1 of the raised mid vowel and high vowel is 0.33 Bark and between the raised mid vowel and exceptionally overlong mid vowel 0.5 Bark. In the speech of JP the same distances are 0.31 and 0.67 Bark.

In the Võru dialect, the unrounded mid back vowel [ɤ] is acoustically relatively more front than in Standard Estonian (see Eek, Meister, 1998). However, phonologically (e.g. in the case of vowel harmony), [ɤ] behaves like a back vowel. There are some differences between speakers in the production of [ɤ] and [ɤ̯]. In the speech of EK this overlong raised mid vowel is a little higher and more front than the mid vowel. In the speech of JP the overlong raised mid vowel is also higher but more back than the mid vowel. In the speech of EK the distance between the F1 of the raised mid vowel and mid vowel is 0.49 Bark. In the speech of JP the same distance is 0.74 Bark.

### Mulgi dialect

The average formant values of overlong vowels of the Mulgi speaker are given in Table 3 (see also Figure 4).

As it can be seen, in the Mulgi dialect like in the Võru dialect, the raised mid vowels are also very close to the high ones.

Table 3. Average formant values of overlong vowels in Hz and Bark (speaker JV).

Vowel (N)	F1		F2		F3	
	Herz	Bark	Herz	Bark	Herz	Bark
ɑ (14)	710	6.60	1292	10.12	2515	14.54
e (6)	572	5.53	1906	12.69	2492	14.48
ē (15)	418	4.18	2195	13.63	2884	15.43
i (8)	404	4.05	2263	13.84	2832	15.31
o (1)	523	5.12	865	7.68	2114	13.38
õ (10)	462	4.58	776	7.07	2183	13.60
u (12)	427	4.27	732	6.76	2176	13.58
ɤ (1)	489	4.82	1532	11.23	2199	13.65
æ (9)	706	6.57	1656	11.75	2399	14.23
ø (11)	439	4.38	1707	11.95	2322	14.01
y (6)	405	4.06	1634	11.66	2242	13.77

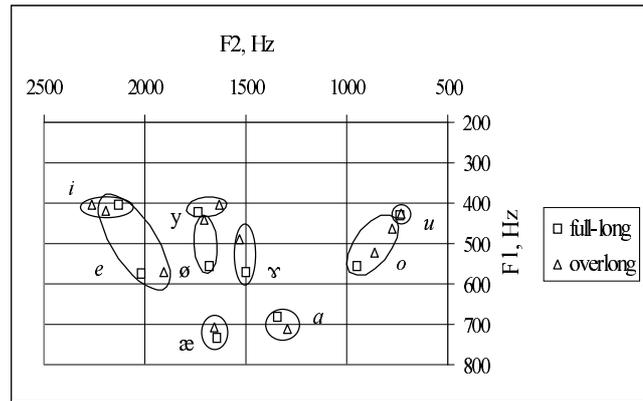


Figure 4. Average formant values of full-long and overlong vowels (speaker JV).

The overlong raised mid vowel [ē] is a little lower and more back than the high vowel [i]. In comparison with the full-long and exceptionally overlong mid vowel [e], the overlong vowel [ē] is much higher and more front. The distance between the F1 of the raised mid vowel and high vowel is 0.13 Bark. The same distance between the raised mid vowel and exceptionally overlong mid vowel is 1.35 Bark (the distance between the raised mid vowel and full-long mid vowel is same).

The rounded overlong raised mid vowel [ø] is slightly lower and more front than the high vowel [y]. At the same time it is much higher than the full-long mid vowel [ø]. The distance between the values of F1 of the raised mid vowel and high vowel is 0.32 Bark, and between the raised mid vowel and mid vowel it is 1.02 Bark.

The rounded overlong raised mid vowel [ɔ] is lower and more front than the high vowel [u]. In comparison with the full-long and exceptionally overlong mid vowel [o] (there was only one word with overlong [o]), the overlong raised mid vowel has moved higher and backwards. The distance between the F1 of the raised mid vowel and high vowel is 0.31 Bark, and between the raised mid vowel and exceptionally overlong mid vowel 0.44 Bark. The distance between the F1 of the raised mid vowel and full-long vowel is 0.82 Bark.

In the analysed text there were only some words that contained [ɤ] and [ɤ̯]. It has been already said that overlong [ɤ] is raised only occasionally in the Mulgi dialect. As there was only one pronunciation case of [ɤ̯] it cannot be stated that [ɤ] would be raised in other words, too.

## Discussion

As it can be seen, both in the Võru and Mulgi dialects the raised mid vowels are very close to high vowels in their quality. In the psychoacoustical vowel space, the distances between these vowels are less than 1 Bark. The distance between the F1 of mid vowels and raised mid vowels is bigger but still remains under 1 Bark. However, in the speech of the Mulgi speaker, the distance between [e] and [e̝] is over 1 Bark (1.35 Bark). While the distance between raised mid vowels and high vowels on the psychoacoustic scale is very small, it can be assumed that listeners do not perceive difference in the quality of these vowels. Perception tests where words forming minimal pairs were used as stimuli have affirmed this assumption (see Teras, 2003a, b).

Leemet (2003) reports preliminary results on the quality of long vowels of the Western dialect. Formant values of long vowels of one male speaker (born in 1904) of Varbla were analyzed. Varbla is one of main sub-dialects of the Western dialect. The analysis showed that in that sub-dialect there are also mid vowels in Q2 words but in Q3 words these mid vowels [e], [ø], and [o] are raised. The distance between the F1 of the raised front mid vowel [e̝] and high vowel [i] is 0.71 Bark. As compared to the full-long mid vowel [e], the raised mid vowel [e̝] is higher (distance between values of F1 0.78 Bark). The rounded raised mid vowel [ø̝] is higher than the full-long mid vowel [ø] (distance between values of F1 0.85 Bark). The high vowel [y] has diphthongized in Q3 words in the Western dialect. The raised mid vowel [o̝] is higher than the mid vowel [o] (distance between values of F1 0.7 Bark) and lower than the high vowel [u] (distance between values of F1 0.75 Bark).

It can be seen that the raising of mid vowels in Varbla is not as extensive as in South Estonian dialects. Raised mid vowels remain between high vowels of Q3 words and mid vowels of Q2 words.

## Conclusion

There are little differences in the range of raising among the speakers but the tendencies of raising are same in the speech of all speakers of South Estonian. The raising of mid vowels is extensive both in the Võru and Mulgi dialect (to say more about Mulgi dialect, the vowels of more speakers have to be analysed). In both dialects raised mid vowels are very close to

high vowels, although they remain a little lower. On the psychoacoustic scale, the distance between raised mid vowels and high vowels is very small. This situation resembles those described as near-mergers. As a result of raising, mid vowels alternate with raised mid vowels that acoustically differ a little from high vowels, but are eventually not distinguishable from them by listeners.

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