

The influence of Swedish on prepausal lengthening in Estonian

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Abstract

A difference in prepausal lengthening was found when the unscripted speech of Estonians living in Sweden for more than 50-60 years was compared to that of Estonians resident in Estonia. Vowel durations in CVCV words in prepausal and non-prepausal position were measured. In Estonian, the vowel of the first, stressed syllable can be short (Q1), long (Q2) or overlong (Q3) while duration of the second syllable vowel is inversely proportional to the quantity degree of the first. For both groups of speakers, prepausal lengthening was strongest in the final syllable of the word. A lengthening was found also in the penultimate stressed syllable, but with one exception: the Q2 vowel of the speakers living in Estonia. The reason may have been the relatively small difference in duration between Q2 and Q3. The Swedish-Estonian speakers had a prepausal lengthening pattern resembling that of Swedish which in some cases resulted in a considerable durational overlap between Q2 and Q3.

Introduction

It is not unusual that long time speakers of a second language (L2) acquire a distinct “foreign accent” in their native language (L1). Even if there is no easily noticeable accent, there can be differences that can appear on both segmental and prosodic levels. The present study addresses one such perceptually not easily noticeable feature: prepausal or final lengthening. Very little has been written on the phonetic influence of L2 on L1, and on the subject of prepausal or final lengthening in this connection there are, as far as I know, no studies at all. (The terms prepausal lengthening and final lengthening overlap in a great part. However, prepausal words need not always be phrase or sentence final.)

Final lengthening has been observed in a number of languages and different theories on the domain and size of lengthening have been proposed. It has also been assumed to be language dependent. For instance, some researchers have expected little, if any, final lengthening in languages where phonological length distinctions play an important role, such as e.g. in the Fenno-Ugric languages (Oller and Smith, 1977). However, it has been shown that prepausal lengthening does exist in Finnish (Hakokari et al, 2005), In Hungarian (Hockey and Fayal, 1999) and in Estonian (Krull, 1997).

It has also been assumed that the main domain of final lengthening is concentrated on the final syllable of a word and research has been concentrated on it. However, for several

languages, e.g. English (Byrd and Saltzman, 2003), German (Kohler, 1983), Dutch (Cambier-Langeveld, 1997), a weaker final lengthening has been shown to be present also in (ante)penultimate stressed syllables. Similarly, final lengthening in Swedish is present in the whole word although it is strongest in the word-final rhyme (Heldner and Megyesi 2003). For a detailed study of final lengthening in Swedish see Lyberg (1981).

Estonian speakers have partly different strategy. As in the other cited languages, the strongest lengthening was found in the final syllable. However, the vowel of a penultimate stressed syllable in a 'CVCV word had a lengthening only if it was short (Q1) or overlong (Q3), but not if it was long (Q2). (Krull 1997). There is relatively little durational difference between Q2 and Q3, therefore lengthening Q2 segment could result in (or increase) a temporal overlap with Q3.

About the Estonian quantity system

Estonian has three phonologically distinct lengths for both vowels and consonants in a stressed syllable. V1 and/or the following C can act as quantity carriers. To take a 'CV1CV2 word as an example, the duration relation of V1 in the three degrees of quantity is according to Liiv (1962) 1.00:1.72:2.02 and the durations of the unstressed vowels are inversely related to the those of the first, stressed vowel. Similar observations have been made by Eek (1974) and others. The duration of the quantity carrying

segment, in this example V1, has the greatest importance for the perception of quantity. All surrounding segments have an inverse effect, that of the vowel of the following syllable being the strongest. (Traunmüller and Krull, 2003).

Method

The material consisted of four recorded conversation sessions with subjects residing in Sweden who have Estonian as their first language. SE1 (female), SE2 (male) and SE3 (male) came to Sweden after the end of World War II at the age of 12, 8 and 4 years, respectively. ES4 (male) was born in Sweden in the middle 1950es. The conversations were held with each subject separately and consisted of short questions or remarks from the part of a researcher and long narratives by the subjects. The recordings were made by researchers at the Department of Modern Languages, Uppsala University in 2005 and 2006, in home-like surroundings using high quality equipment (sampling frequency 41 000 Hz).

Words of the form (C)V1CV2 in prepausal and non-prepausal position were located. V1 was short, long or overlong and the intervocalic C short. In very few cases the word began with V1. This form was chosen in order to simplify comparison: the intervocalic C being always short, V1 was the sole carrier of the quantity distinction. The criterion of a pause for the prepausal words was a silent interval of at least 100 ms. Perceivably drawn-out final segments, such as in hesitation, were not included.

The duration of V1 and V2 was measured according to traditional criteria, using the sound wave and wide band spectrogram of the Soundswell Signal Workstation (© Hitech Development AB 2000), The h-like section at end of the second vowel – which can be both long and prominent in Estonian – was not included.

The material used for comparison comes from Krull (1997) where the recordings consisted of three conversation sessions between the present author and subjects living in Estonia: EE1 male, EE2 and EE3 (female), aged 45-60.

Results and discussion

In Table 1 the V1 and V2 durations of SE speakers in non-prepausal and prepausal position are shown. It can be seen that for all speakers, the duration of both vowels increases

in prepausal position. For SE2 and SE3, the difference between Q2 and Q3 diminished in prepausal position, and remained unchanged for SE4. The difference increased slightly only for SE1 who had a very small difference in non-prepausal position.

Table 1. Median vowel durations (ms) in CV1CV2 words for four speakers in three degrees of quantity.

Sp	Non-prepausal			Prepausal		
	V1	V2	N	V1	V2	N
SE1	78	91	43	84	142	47
Q1	150	72	30	185	143	11
Q2	159	68	30	226	115	25

Sp	Non-prepausal			Prepausal		
	V1	V2	N	V1	V2	N
SE2	81	95	17	87	138	19
Q1	124	81	19	154	124	15
Q2	170	73	16	167	102	16

Sp	Non-prepausal			Prepausal		
	V1	V2	N	V1	V2	N
SE3	71	91	25	93	143	27
Q1	111	84	29	150	119	11
Q2	151	65	18	188	123	15

Sp	Non-prepausal			Prepausal		
	V1	V2	N	V1	V2	N
SE4	73	105	23	95	163	53
Q1	159	76	21	179	146	16
Q2	194	72	30	223	112	19

For SE speakers, the duration ratio between Q2 and Q3 for V1 varied between 0.72 and 0.94 in non-prepausal position and between 0.80 and 0.92 prepausally. For EE-speakers, the Q2:Q3 ratio varied only between 0.76 and 0.79 non-prepausally and between 0.60 and 0.69 prepausally which shows that for EE speakers, the difference between Q2 and Q3 was always enhanced in prepausal position.

Figure 1 shows percent change in vowel duration between words in non-prepausal and prepausal position for EE-speakers. (Krull 1977). Values for SE-speakers are shown in Figure 2. Comparing the size of prepausal lengthening between the two groups of speakers, a clear difference can be seen in Q2 words: EE speakers had a slight, statistically (Mann-Whitney U-test) not significant shortening of V1 while SE speakers had a 17% to 34% lengthening ($p > 0.01$) instead. In addition to that,

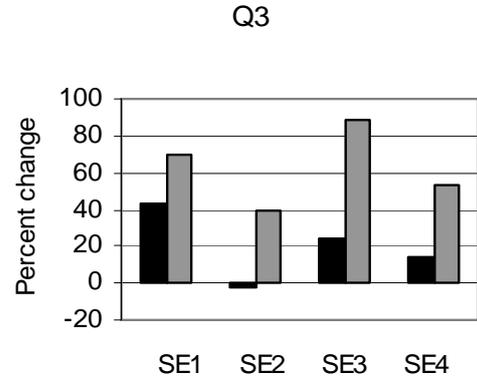
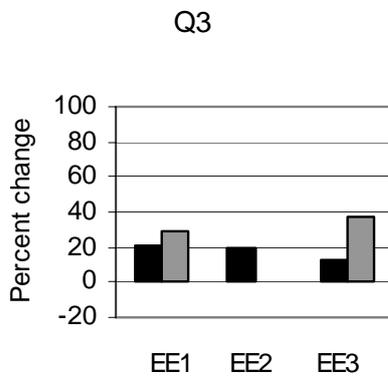
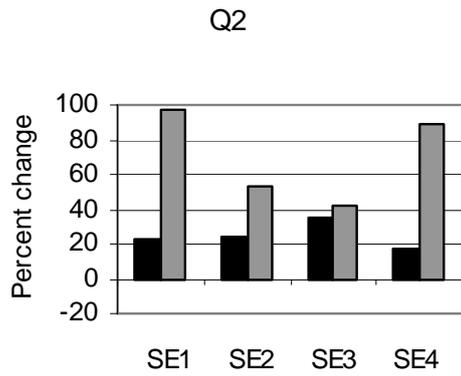
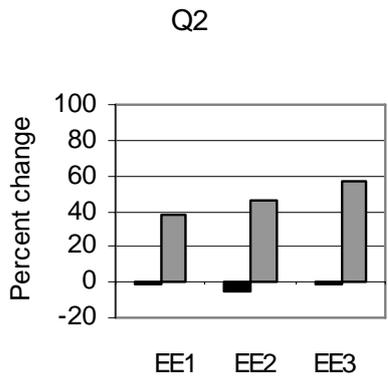
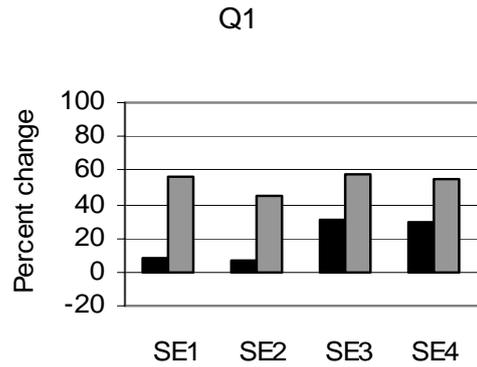
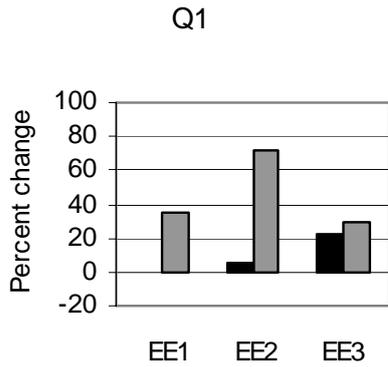


Figure 1. Percent change in vowel duration in CV1CV2 words between non-prepausal and prepausal position of three Estonian speakers. V1=black columns, V2=gray columns.

Figure 2. Percent change in vowel duration in CV1CV2 words between non-prepausal and prepausal position of four Swedish-Estonian speakers. V1=black columns, V2=gray columns.

there was less variation between speakers within each group of Q2 words compared to Q1 and Q3.

For all three EE speakers, V2 was always longer in prepausal position. Generally, there was a tendency towards more lengthening for the SE speakers, especially for V2. This seems to agree with Lehiste and Fox (1993) who found that Estonians expect less final lengthening than do speakers of English and Swedish.

Conclusions

In Estonian, segment durations have a high functional load. Durational contrasts are maintained more consistently than in languages with simpler quantity systems like Finnish and Swedish (Engstrand and Krull, 1994).

EE-speakers were also very consistent in keeping a durational distance between degrees of quantity, although this meant that prepausal

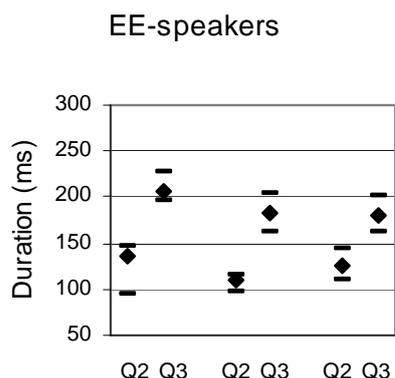


Figure 3. Median V1 durations with upper and lower quartiles for Q2 and Q3 in prepausal position for three EE-speakers.

lengthening had to be performed in different ways for different degrees of quantity. This is remarkable because keeping the quantity degrees apart is not strictly necessary for understanding: it is not often that Q2 and Q3 could be exchanged without resulting in syntactic or semantic anomaly. Maybe that was one reason why SE-speakers could adopt the foreign way of prepausal lengthening although this resulted in considerable durational overlap between Q2 and Q3.

Oller (1977) and Lindblom (1978) have argued that prepausal lengthening is to a great part a learned and language dependent behavior. The present data show that it can even be *relearned* later in life due to the influence of a second language.

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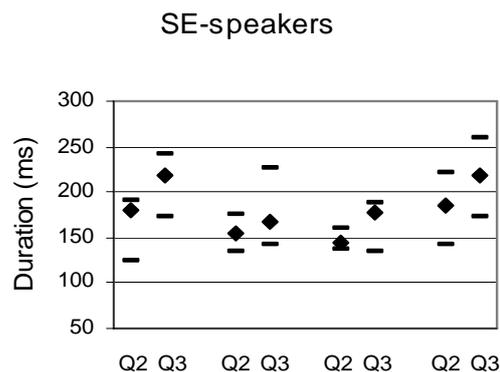


Figure 4. Median V1 durations with upper and lower quartiles for Q2 and Q3 in prepausal position for four SE-speakers.

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