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INTONATIONAL CONTOUR ALIGNMENT IN SAAREMAA AND STANDARD ESTONIAN*

Abstract. The dialect of Estonian normally singled out as differing from the standard in its "sing-songy" melody is that of the island of Saaremaa. The characteristic intonation of this variety is attributed to historic contacts with Swedish and has been shown to be phonetically manifested in differences in peak alignment. The present paper extends the analysis of two previous studies (Asu 2004a; 2005) dealing with tonal alignment in the Saaremaa variety by concentrating on the study of the nucleus in declarative read sentences. The nucleus in Standard Estonian is often low and level, the pattern which in autosegmental-metrical analysis of intonation is labelled as H+L*. The delay of intonation peaks which implies a rightward shift in Saaremaa Estonian represents a trend towards lower pitch on the accented syllable. It is tested here whether this shift to the right precludes a distinct low accentuation. It appears that this is not the case and that both intonation patterns are distinct also in the Saaremaa variety. The finding suggests that the peak delay is a local phenomenon involving specific pitch events rather than a global displacement of the whole intonation contour.

Keywords: Estonian, intonation, peak alignment, intonational phonology, variation.

1. Introduction

Systematic differences between dialects of Estonian in the realisation of fundamental frequency (F0) were first observed in the 1930s (Niilus 1935; Põldre 1938). When addressing the question of intonational variation of Estonian, the geographical area of immediate interest is the islands off the west coast of the Estonian mainland. The speech melody on almost every major Estonian island is slightly different. But the variety that gets most mention with respect to its intonation is the variety spoken on the island of Saaremaa which is often impressionistically characterised as "sing-songy". Ellen Niit (1977; 1980) suggests that the distinct speech melody of the dialect is due to direct historic contacts between Estonian in those areas and

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Swedish. A sociolinguistic survey of Saaremaa inhabitants' attitudes to their local variety reveals that the term "sing-songiness" can be used to characterise the speech of about 50% of the inhabitants of the island (Koreinik 2001). The degree of "sing-songiness" is by no means present in the speech of all native Saaremaa inhabitants and diffuses on the island towards the east being most noticeable in the western parts (Lonn, Niit 2002 : 11).

Very little research has been carried out in order to establish the phonetic characteristics of the Saaremaa variety. E. Niit (1980), in her study on the word prosody of Estonian coastal and island varieties, shows that in these varieties the unstressed syllable following the stressed syllable is higher in pitch, which implies that the F₀ peaks in Saaremaa Estonian are aligned later than in the standard. E. Niit's work enables E. Niit and M. Rimmel (1985) to hypothesise that Estonian coastal and island dialects form a transitional area between Standard Estonian and Swedish with respect to the use of tone: the F₀ contour in these varieties is an intermediate form between the Swedish accent 1 (early peak characteristic of the mainland Estonian dialects), and accent 2 (generally characterized by a late peak). To date, no experimental study involving Saaremaa Estonian and Swedish has tried to check this hypothesis.

A direct comparison of peak alignment in Saaremaa and Standard Estonian is presented in two papers by E. L. Asu (2004a; 2005). The former study tested the peak delay hypothesis but failed to find a significant difference in the normalised alignment of the two first peaks of an intonational phrase. The non-significant result was attributed to such factors as the selection of speakers (young females from the largest town on the island, Kuressaare) and the nature of the data (tightly controlled read speech). However, the same study (Asu 2004a) did reveal an unexpected significant prosodic difference between the two varieties: the pitch height at the start of the intonation phrase (normalised in relation to the pitch span of an accent unit) was found to be on average lower in Saaremaa Estonian than in Standard Estonian.

Asu 2005 investigated further the alignment of intonational peaks addressing the issue of measurement points. It appeared that a better parameter for capturing the difference in tonal alignment is the turning point rather than the maximally highest F₀ value as was used in Asu 2004a. In addition to being perceptually more salient, the turning point is also more easily identifiable than the F₀ peak which is often not manifested as a single point in the F₀ contour. Consequently, the comparison of upper and lower turning points in the two varieties revealed a significant alignment difference between Saaremaa and Standard Estonian. In both cases, the points in the Saaremaa variety were consistently aligned later than in Standard Estonian.

Thus, on the basis of these two papers it is possible to summarise the difference between the alignment of F₀ contour in Saaremaa and Standard Estonian in Figure 1 (from Asu 2005). The F₀ contour in Standard Estonian starts higher than in the Saaremaa variety, and the H is aligned with the right edge of the stressed vowel. In Saaremaa Estonian, the pitch accent gesture appears to be shifted to the right resulting in a lower syllable initial pitch, a later upper turning point aligned well after the end of the stressed vowel, and a delayed lower turning point.

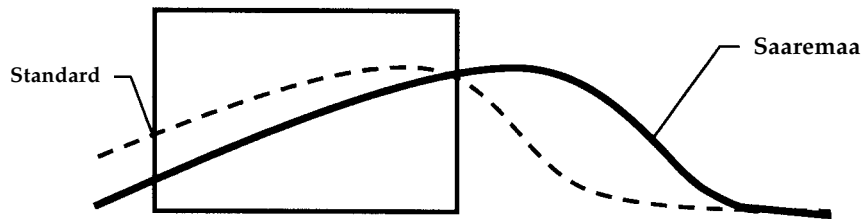


Figure 1. A schematic representation of the pitch accent gesture in Standard Estonian (dashed line) and Saaremaa Estonian (bold line). The box indicates the stressed vowel.

2. Research questions

The aim of the present study is to elaborate on the investigation of peak alignment in the two varieties by analysing more closely the alignment in the nucleus. It was shown in Asu 2004b that the nucleus in Estonian declarative utterances is often low and level and is preceded by a high unaccented syllable, the pitch accent which in terms of the autosegmental-metrical analysis of intonation was analysed as H+L*. A detailed investigation of such nuclei revealed that the low accentuation can spread to prenuclear position, and consequently several patterns emerged depending on where in the utterance the low accentuation first occurred. It was also noted in Asu 2002 and 2004b that the patterns turn out to be governed by systematic co-occurrence restrictions. Specifically, all accents that follow a prenuclear low accent must themselves be low. In the extreme case, when even the first accent is low, all the accented syllables in an utterance will be realised as low, as is exemplified in Figure 2.

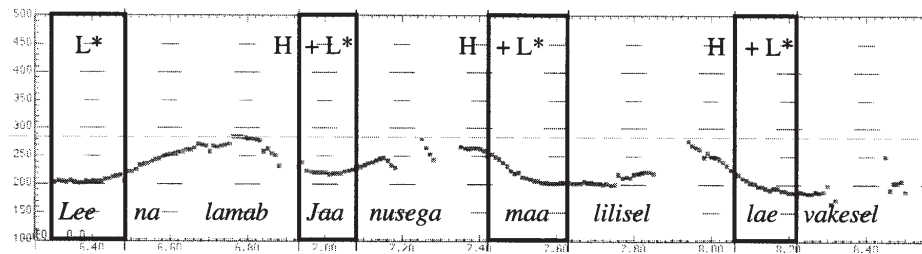


Figure 2. An F0 contour of the utterance *Leena lamab Jaanusega maalilisel laevakesel* 'Leena is lying with Jaanus on a picturesque little boat' in Standard Estonian exemplifying the pattern where all the accented syllables (marked with boxes) are low (L*).

Saaremaa Estonian could be an interesting test case for the low accentuation pattern as the alignment of H and L turning points differs significantly from the standard. The rightward shift of the accent pattern raises the question whether the Saaremaa system would also accommodate a contrasting low accent, since the shift represents a trend towards lower pitch on the accented syllable as shown in Asu 2004a (see Figure 1). A further question is whether the timing delay, observed for H* accents, reflects a global displacement of the sentence contour, or a local phenomenon involv-

ing specific pitch events. This will be tested with reference to H+L* nuclear pitch accents. In addition, also the alignment of H*+L nuclei will be investigated to see whether the peak delay shown to characterise initial peaks is also evident in the nucleus.

3. Materials and method

The present paper uses the same set of tightly controlled read declarative sentences as Asu 2004a and Asu 2005. From each variety the data of five female speakers is included. All subjects of Standard Estonian were university students recorded in Tartu, and the Saaremaa subjects natives of Saaremaa who all lived in Kuressaare at the time of the recording. The recordings in both locations were conducted in a quiet environment using a Sony TCD D8 portable DAT recorder and a dynamic microphone with a cardioid response. The subjects were asked to read the test sentences from a list where each sentence appeared five times in a semi-randomised order.

The data was digitised at 16 kHz using Xwaves+™ running on a Silicon Graphics Unix workstation, and an F0 contour and a wide-band spectrogram were computed for each utterance. For the purposes of the present analysis 20 sentences were analysed for each of the ten speakers (total 200 sentences). The F0 (Hz) and time (sec) measurements were taken at the relevant F0 events for H*+L and H+L* nuclei: (1) the upper turning point (H* or H), i.e. the point at which the F0 changes its direction from rising to falling, or from level to falling, or from a shallow to a steep fall, and (2) the lower turning point (L or L*), i.e. the point at which the steep fall ends and the flattening of the F0 starts. Additionally, the beginning and end of the accented vowel, and the end of the F0 contour were measured. The temporal mid-point between H and L (the so called "mid-fall") was calculated and used as the alignment measure. This point was normalised relative to the duration of the accent unit.

4. Results and discussion

Figure 3 shows the comparison of the normalised alignment of nuclear H*+L accent in Saaremaa and Standard Estonian. The location of mid-fall is expressed as a percentage of the final accent unit (x-axis). The dark bars represent the data of the speakers of Standard Estonian and the light bars

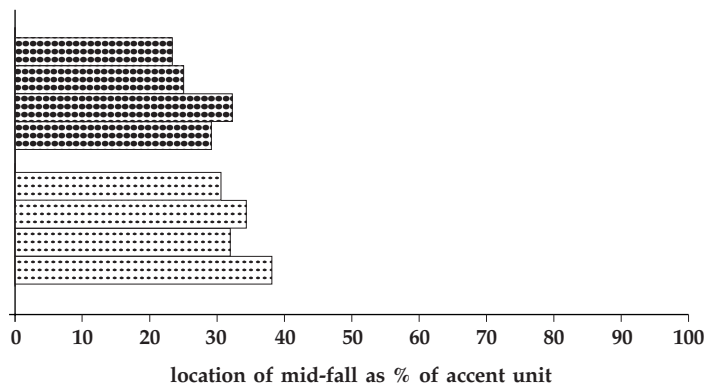


Figure 3.
The comparison of H*+L nuclear alignment in Standard Estonian (dark bars) and Saaremaa (light bars).

that of Saaremaa Estonian. From each variety the data of only four speakers could be included because in the data of one speaker from each variety no nuclei were realised as H*+L accents. It can be seen that the location of mid-fall is on average later in the Saaremaa variety; the comparison of the averages yields a significant result ($p < 0.05$).

Figure 4 presents the comparison of the H+L* nuclei in the two varieties. Again only four speakers of each variety could be included because the data of one speaker of each variety did not contain any low nuclei. It can be seen in the figure that the mid-point between H and L* in Standard Estonian is slightly later than in Saaremaa but the difference is not significant ($p > 0.05$).

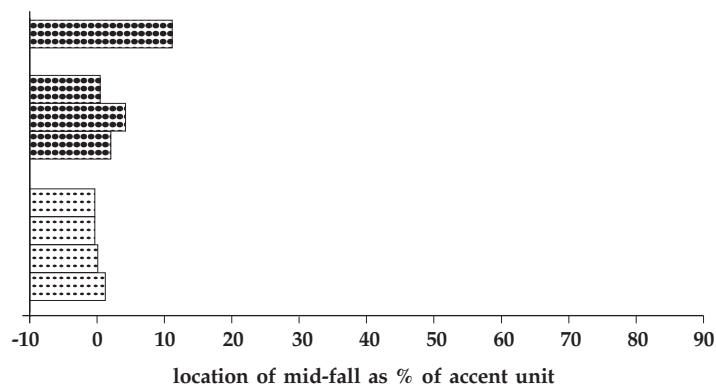


Figure 4.
The comparison of nuclear H+L* alignment in Standard Estonian (dark bars) and Saaremaa (light bars).

5. Conclusion

The present study investigated tonal alignment in the nuclei of read declarative sentences in Saaremaa and Standard Estonian. It had been shown previously (Asu 2005) that the initial H* peaks in the Saaremaa variety are delayed as compared to Standard Estonian. The present comparison reveals that the delay demonstrated early in the intonation phrase also happens in nuclear position.

On the other hand there is no significant alignment difference between Saaremaa and Standard Estonian for the nuclear H+L* accent. This suggests that alignment differences between dialects are not a global property of the pitch contour but are specific to particular pitch accents.

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Eva Liina Asu

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**ПОЛОЖЕНИЕ ИНТОНАЦИОННОЙ КРИВОЙ
В СААРЕМААСКИХ ГОВОРАХ ЭСТОНСКОГО ЯЗЫКА
И В ЛИТЕРАТУРНОМ ЯЗЫКЕ**

Отличительная черта сааремааского эстонского языка, особенно по сравнению с литературным языком, состоит в «напевности» его мелодики. Причиной этой специфической интонации считаются исторические контакты со шведским языком, фонетически же это выражается в различном положении типов F0 (Niit 1980; Asu 2005).

Статья служит продолжением двух предыдущих исследований Э. Л. Асу (Asu 2004a; 2005), она посвящена сравнительному изучению конечного акцента в начитанных повествовательных предложениях сааремааского эстонского языка и литературного языка. В литературном языке конечный акцент повествовательных предложений часто бывает низким и плоским (Asu 2004b). Такой рисунок в ауто-сегментальном анализе интонации рассматривается как H+L*. Более позднее положение интонационных вершин в сааремааском эстонском языке указывает на сдвиг всей кривой вправо и реализацию акцентированного слога как низкого. Здесь автор проверяет, не значит ли такой сдвиг вправо, что в сааремааском эстонском языке отсутствует обособленный низкий акцент. Результаты показывают, что это все же не так, и обе интонационные модели (H*+L и H+H*) различимы в сааремааском эстонском языке, а это в свою очередь позволяет полагать, что более позднее положение вершин — скорее локальное явление, чем глобальный сдвиг всей интонационной кривой.