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IN SEARCH OF WORD ACCENTS IN ESTONIAN SWEDISH

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ABSTRACT

This study focuses on the word accent opposition in a lesser known and endangered variety of Swedish – Estonian Swedish. The variety has been described as not making the tonal distinction between Accent 1 and Accent 2 words, but no systematic acoustic phonetic investigation has been carried out previously to confirm these descriptions. As materials, disyllabic words from read sentences, spontaneous dialogues and elicited speech produced by nine elderly Estonian Swedish speakers were used. The comparison of tonal patterns of words with Accent 1 and Accent 2 showed that there is no consistent word accent opposition in this variety. However, some variation was found in the realisation of pitch contours in different speech styles, which might refer to possible traces of an earlier accent distinction.

Keywords: word accents, Estonian Swedish, Scandinavian tonal typology.

1. INTRODUCTION

Swedish is well-known for its (tonal) word accent opposition which is phonetically manifested as a timing difference of the pitch contour: the F₀ peak in words with Accent 1 is earlier than in those with Accent 2 [e.g. 7, 12, 3]. Bruce [3] showed that intonational prominence also plays a major role in dividing regional varieties of Swedish into two groups based on whether or not they make a clear distinction between focal and non-focal accentuation. The central varieties of the East (e.g. Stockholm) and West (e.g. Gothenburg) make such a distinction while the other varieties do not.

There is considerable regional variation in the realisation of the word accents in Swedish, as well as more broadly in the area where Scandinavian languages are spoken. Typically, the word accent opposition does not occur in the periphery of this area, including Faroese and Icelandic, some South Danish, and Finmark Norwegian dialects and some West Norwegian dialects around Bergen [3]. Also, in most Finland Swedish dialects there is no accent distinction with an exception of West Nyland which

has a two-accent system similar to that of central Swedish [16, 17].

The present study aims to investigate word accent distinction in a variety of Swedish that has normally not been included in Scandinavian accent typologies – Estonian Swedish (ES). This highly endangered variety was historically spoken on the islands and North-Western coastal areas of Estonia, but most of the speakers fled to Sweden towards the end of WWII. Today the estimated number of ES speakers is around one hundred. With their disappearance this variety will cease to exist.

The word accent distinction in ES has not been subject to earlier phonetic investigation, except [15] which dealt with accentuation in compound words. In traditional accounts, ES is characterised as only having one kind of word accent [e.g. 8]. An original opposition between Accent 1 and Accent 2 is, however, almost certainly thought to have existed [10], but is said to have been lost due to the influence of the contact language Estonian [9]. This seems plausible, considering that according to some theories of the origin of the tonal accent [11, 5] the Scandinavian accent opposition developed in the early Middle Ages, which is about the time when the first Swedish speakers started to settle in Estonia.

It was found in [15] that the contours of short and long compounds of ES resembled most those of Finland Swedish, where no word accent opposition occurs. This paper focuses on accentuation in disyllabic simplex words with stress on the penult. Words of this type have been used in numerous previous descriptions of word accents in regional varieties of Swedish [e.g. 2, 7, 4]. With the view of earlier experimental work as well as descriptive accounts of ES and the general typology of Scandinavian tonal accents, we would expect ES not to exhibit the word accent opposition in simplex words. It is nevertheless possible that traces of the word accent distinction can be found similar to, for instance, those of the Närpes dialect of Finland Swedish [18].

The paper is divided into two parts. Study 1 investigates the tonal patterns of read and spontaneous stressed words produced with or without focal accent, where the accent opposition is expected to appear. Study 2 uses a more controlled set of read and elicited speech materials consisting

of (near) minimal pairs with the same segmental features and a phonological distinction only in the tonal realisation of the word accents, e.g. Accent 1: /'po:len/ (Poland) – Accent 2: /'pò:len/ (the pole).

2. STUDY 1

2.1. Speech materials

Five female and four male speakers of the Ormsö-Nuckö-Rickul dialect of ES were recorded between 2008 and 2014 in quiet settings in the field. The recording equipment consisted of either a Sony Portable DAT recorder TCD-D8 or a Roland R-09HR WAVE/MP3 recorder, both with a Sony tie-pin type condenser microphone ECM-T140. Three speech styles were collected: 1) read words in the ES carrier sentence *Jag sade X åter* /ja: sa: X o:ter/ (I said X again), 2) spontaneous dialogues, and 3) isolated words elicited from a word list adapted from the SweDia 2000 word list used for other Swedish dialects [6]. Some speakers participated in several recording sessions. A total of 51 read, 198 spontaneous, and 83 elicited isolated words were extracted from the recordings. Table 1 shows the number of speakers and word tokens of Accent 1 and Accent 2 in the three speech styles in the data.

Table 1: The number of analysed speakers and Accent 1 and Accent 2 tokens in the three speech styles in the data used in Study 1 (the number of words with focal accent within parentheses).

Speech style	Speakers	Accent 1 words	Accent 2 words
Read	7	20 (8)	31 (8)
Spontaneous	2	88 (32)	110 (45)
Elicited	7	40 (40)	43 (43)

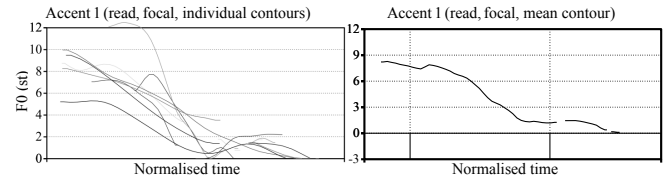
2.2. Method and procedure

All WAV files were sampled at 44.1 kHz, 16 bit and then downsampled to 16kHz. The F0 analysis methods – implemented as a number of Praat [1] scripts – have previously been used to study prosodic variation in Swedish [e.g. 13, 14, 15]. Segment boundaries were manually placed at the onset of every vowel; individual F0 contours were generated and each token was manually checked. To facilitate between-speaker comparison, the contours were normalised by setting the minimum F0 for every speaker to 0 semitones (st). Mean F0 contours were computed for each speech style by calculating the mean F0 in 100 evenly distributed points in each test word. Figure 1 shows an example of individual F0 contours and the corresponding mean F0 contour.

First, we compared the tonal patterns using the mean contours of all tokens of each speech style, and found no clear difference between Accent 1 and

Accent 2. We therefore created additional mean F0 contours for each speech style using only the tokens judged by one of the authors to have focal accent.

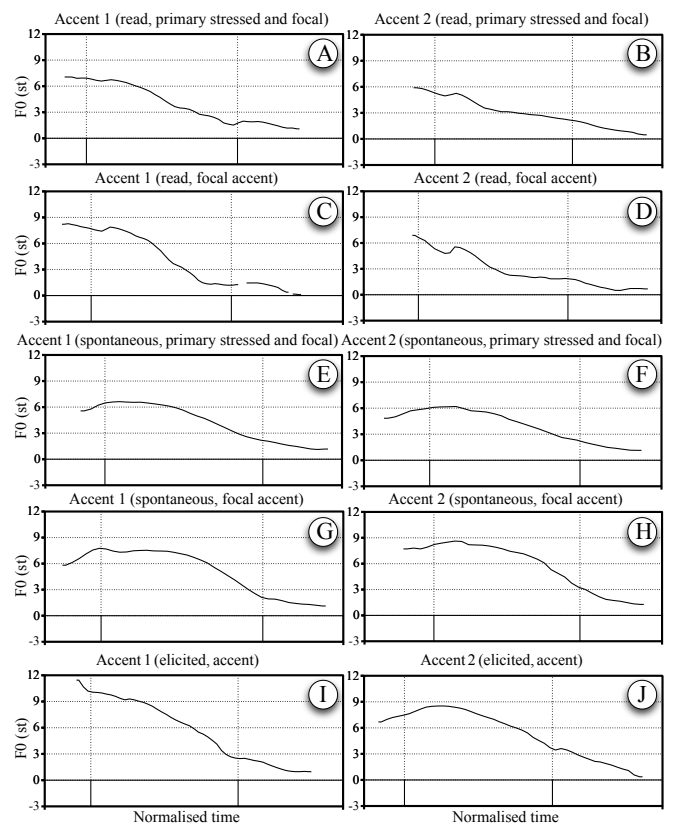
Figure 1: Individual and average F0 contours for the read speech (vertical lines mark the vowel onsets).



2.3. Results and discussion

Figure 2 shows average F0 contours for the primary stressed and focal Accent 1 and Accent 2 words in the three speech styles.

Figure 2: Average F0 contours for read, spontaneous and elicited words (vertical lines mark the vowel onsets).



The F0 contours for the read words (panels A–D) are all characterised by an early F0 peak near the onset of the first vowel followed by a fall throughout the rest of the word. Similar contours are found for the primary stressed and focal words, although a slightly later tonal peak can be observed in Accent 2.

For the spontaneous words (panels E–H), the contours are also very similar, with no noticeable tonal differences between primary stressed and focal

Accent 1 and Accent 2. What is striking, however, is that the contours for the spontaneous words have a slightly later peak and a following fall as compared to those of the read words. This may be explained by the fact that the read words were often produced with a lower speech rate and the tonal targets were more precisely reached. An analysis of word durations would clarify this matter.

The contours for the elicited isolated words (panels I–J) display a clear difference between the word accents: the tonal peak in Accent 2 is later than in Accent 1. It can be seen that Accent 1 begins with an early peak, followed by an F0 fall throughout the word, and a tendency to a low plateau after the onset of the second vowel in the end of the contour. In Accent 2, F0 rises until well after the onset of the stressed vowel, and then falls throughout the rest of the word. Interestingly, the tonal pattern of elicited Accent 1 (panel I) is broadly similar to that of read speech (panels A and C), while the elicited Accent 2 contour resembles the spontaneous tonal pattern (panels E–F).

The fact that there is no difference in the tonal patterns for the primary stressed and focal words suggests that ES does not make a distinction between focal and non-focal accents. In this sense, ES would be a typical peripheral variety unlike the central West and East varieties of Swedish that both display double-peaked tonal patterns in focal, but single-peaked patterns in primary stressed non-focal positions (see Figure 4 [cf. 3]).

The similarity of the F0 contours of Accent 1 and Accent 2 words in read and spontaneous speech (panels A–H) suggests that ES lacks a word accent distinction in simplex words. However, the timing difference between the two accents found for elicited words was intriguing, and prompted us to carry out a follow-up study using more controlled data.

3. STUDY 2

3.1. Speech materials

Three female and three male speakers of the Ormsö-Nuckö-Rickul dialect of Estonian Swedish were recorded in 2015 under similar conditions as in Study 1 using a Roland R-09HR WAVE/MP3 recorder. The read material contained ten Swedish words (five minimal pairs of disyllabic simplex words with primary stress on the penult) in focal position. For the elicited speech we used cards illustrating fourteen Swedish words which form minimal pairs in most Swedish dialects. However, as the ES speakers did not realise the words as true minimal pairs, we collected only near-minimal pairs, i.e. Accent 1 and Accent 2 pairs with similar (but not

identical) segmental features. These included /'anden/ (the duck) – /'ànden/ (the spirit), /'ju:den/ (the sounds) – /'jùden/ (the jew), /'po:len/ (Poland) – /'pò:len/ (the pole), /'tanken/ (the tank) – /'tànken/ (the thought), and /'tòmten/ (the building plot) – /'tòmten/ (the gnome). Additional words that did not constitute minimal pairs in ES were used to increase the number of tokens, including /'tòmen/ (the thumb) and /'skal:en/ (the barks). One of the authors carefully listened to the recordings and selected the words that were produced with a clear focal accent for further analysis. The number of speakers and word tokens of Accent 1 and Accent 2 for the two speech styles are shown in Table 2.

Table 2: The number of analysed speakers and Accent 1 and Accent 2 tokens in the two speech styles used in Study 2.

Speech style	Speakers	Accent 1 words	Accent 2 words
Read	6	20	31
Elicited	6	40	43

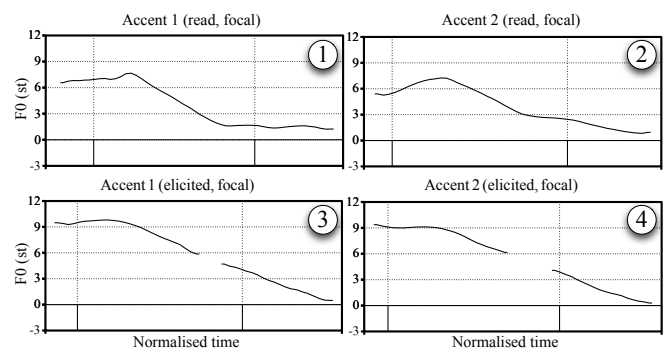
3.2. Method and procedure

The methods from Study 1 were applied. Average F0 contours were computed for each speech style and then compared.

3.3. Results and discussion

Figure 3 shows the average F0 contours for Accent 1 and Accent 2 words in read and elicited speech.

Figure 3: Average F0 contours for the read and elicited words (the vertical lines mark the vowel onsets of the two syllables).



It can be seen that there is no difference between the F0 contours for Accent 1 and Accent 2 in either the read or the elicited words. The read words (panels 1–2) display a slightly rising contour with the tonal peak about a third into the first vowel, followed by a fall and a low plateau before the onset of the second vowel. For the elicited words (panels 3–4) the F0 contour begins with a high plateau followed by a fall throughout the rest of the word. It is not likely that these small differences in the tonal realisation of the

accents between the two speech styles are perceived as different accents.

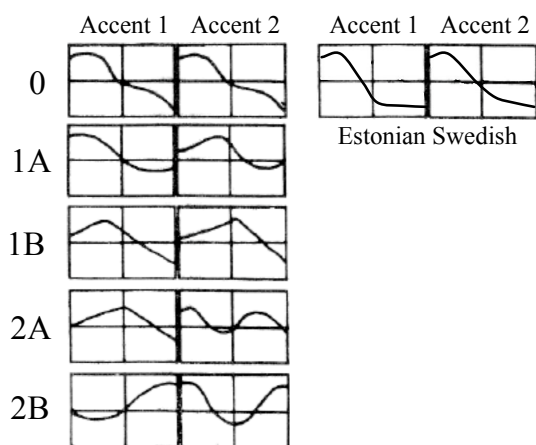
Given that the materials in this study were better comparable, this result probably describes the actual situation better.

4. GENERAL DISCUSSION

The general results from our two studies suggest that there is no contrast between Accent 1 and Accent 2 in ES. The timing difference found between Accent 1 and Accent 2 in the elicited words of Study 1 needs to be further investigated before we can draw any final conclusions about possible traces of word accents. The observed small differences in timing between the various speaking styles cannot be explained straightforwardly. Some of these can be due to the use of different materials and somewhat different scripts in the two studies. Given the small number and the old age of our informants, we experienced some difficulty in eliciting the desired prominence level for all target words and to collect sufficiently large data sets for our analyses. Additionally, microprosodic effects of the surrounding consonant context could have influenced the result. However, several speakers were represented in both studies, and the recording procedures and prominence levels of the words were judged to be similar in the two studies.

Figure 4 shows the five Swedish word accent types based on read words with focal accent according to Gårding [7] with the addition of the contours of ES based on the comparative material from the present study.

Figure 4: Swedish word accent types according to Gårding [7] with the addition of the Estonian Swedish accent type.



ES can be placed as a Type 0 variety alongside Finland Swedish with similar tonal contours for both word accents. Further closer comparisons of ES contours with those of other regional varieties of

Swedish, in particular Finland Swedish, are needed in order to place ES in the intonational typology of Swedish. In this study only the Ormsö-Nuckö-Rickul dialect of ES was investigated. As dialectal differences have been observed in ES [9] it can be the case that the tonal patterning is different in other dialects of ES. This is something that needs to be addressed in further studies as long as there are still speakers of ES left.

5. CONCLUSION

Despite some small differences in the tonal realisation of Accent 1 and Accent 2 words it can be concluded that Estonian Swedish does not have a word accent distinction. This finding fits in with the earlier descriptions of ES as well as general Scandinavian accent tonal typology, where the word accent opposition does not occur in the peripheral varieties. It is possible that the slight timing difference found in elicited speech points to there being traces of accent opposition.

6. ACKNOWLEDGEMENTS

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