

Swedish word accent production by L2-speakers with different tonal L1s

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Abstract

This study addresses the question of whether L1-speakers of Vietnamese – a tone language – and L1-speakers of Somali – a language with tonal accents – differ in degree of accuracy when producing words that carry either of the two tonal accents in L2-Swedish. Some previous studies suggest that it is an advantage when discriminating between different tones in another tone language, if a speaker's L1 is also a tone language; while others show that this may not necessarily be the case. Accuracy was studied with the help of identification tests, and the results for the L2-speakers were matched with the results for L1-speakers. It is revealed that no adequate distinction is made between the tone accents by either of the two groups of L2-speakers. The two tonal patterns are equally often obscured by L1-speakers of Somali, whereas speakers of L1-Vietnamese produced patterns that were more frequently identified as one of the Swedish word accents, but not the other one.

Index Terms: tone accent production in L2, tone accent identification, L1-Vietnamese, L1-Somali, tonal perception, foreign accent, L2-Swedish

1. Introduction

The correct perception and production of the Swedish word accents are some of the obstacles for L2-learners of Swedish. There are two word accents in Swedish and they vary in that their F0-contours are aligned differently in regards to the main stressed syllable in the word. According to observations made by teachers of Swedish as a second language from sessions on pronunciation training, speakers with a tonal L1 seem to be better able to cope with this obstacle.

In the study presented here, the question of: To what extent speakers of different types of tonal L1 have an advantage in the acquisition of tonal features in L2 has been revisited. The novelty of this contribution is, however, that it focuses on the acquisition of word accents in an L2 (= Swedish) by L1-speakers of two languages with a disparate tone typology. More explicitly, the question raised here is whether having an L1 with tone accents is an advantage over an L1 with lexical tones, when mastering tone accents in L2. The three included languages (Swedish, Somali and Vietnamese) all make use of tonal features either lexically and/or morphologically. More detailed descriptions of the role of tonal features in these languages are presented below.

A potential advantage has been investigated here by examining the degree of successful production of tone accent distinction in L2-Swedish during unrehearsed read speech of L1-speakers of Somali and Vietnamese. The rate of correct identifications of the word accents produced by L1-speakers of Swedish served as a measure of whether the L1-speakers of Somali and Vietnamese managed to produce the word accents with equal success.

Further attention has been paid on how successful the individual tonal accents in Swedish have been identified, based on the production data provided by the L2-speakers of the different languages.

1.1. Tonal Perception in L2

According to [1], it is an advantage if the speakers' L1 has lexical tones when it comes to perceptually discriminating between different tones in another tone language. Speakers of non-tonal L1s, on the other hand, seem to be less sensitive to lexical tone contrast ([2]). In cases where a speaker's L1 has pitch accents, the ability to contrast tones in a foreign tone language is comparable to the ability of L1-speakers of a tone language ([3]).

A study on perception accuracy of lexical tones ([4]) suggests a typology of pitch prominence, based on the findings that L1-speakers of a tone language perform best when identifying tones in L2; whereas L1-speakers of a pitch accent language perform less accurately. Although L1-speakers of both of types of languages still perform more accurately than speakers of an L1 with word stress and "intonation-only" characteristics. This means, that the further away the tonal type of an L1 is from the tonal type of L2, the more difficult it is to perceive the lexical tones.

Adopting the pitch prominence typology in [4], the relationship of the L1 investigated in this study (Somali and Vietnamese) to the target language, Swedish, looks like this:



Figure 1: Continuum of pitch prominence typology.

There have also been studies showing that speakers of a tonal L1 do not necessarily perform better at discriminating tonal features in other (tone-) languages ([5], [6]). According to [6], similarities or dissimilarities of the phonemic status and the phonetic features of a particular tonal pattern in L1 are more beneficial than the general linguistic status of tone in L1 when it comes to the ability to discriminate a tonal pattern in L2.

1.2. Tonal Production in L2

In a comparative study on Swedish tone accent production ([7]), it has been shown that L1-speakers of tone languages (Thai and Vietnamese) produced a less systematic distinction when compared to Somali L1-speakers with Somali being a tone accent language similar to Swedish. A follow-up study [8] however showed that the tonal patterns used for the systematic distinction in production were not sufficient for native speakers/listeners to identify the appropriate word as often as those produced by L1-speakers. In the following, the

typology presented in [4] will be tested further from production data. The degree of adequate L2-production of tonal accents by L1-speakers of a tone language (= Vietnamese) will be additionally investigated through perception tests with L1-informants and then compared to the results obtained in [8].

1.3. Tone in Swedish

The two tonal word accents in Swedish are aligned to the stressed syllable in a word. The accent types are called Accent 1 (acute) and Accent 2 (grave). Two segmentally similar words can differ in accent type on the basis of variation of the pitch contour alignment, and lead to several minimal pairs distinguished only by tone accent. If lexical stress falls on the initial syllable, which is the case for the target words in this study, both Accent 1 and Accent 2 may occur and are distinctive in meaning. The word's morphological structure, the placement of the stressed syllable and the origin of the word, decides the occurrence of either of the two accents.

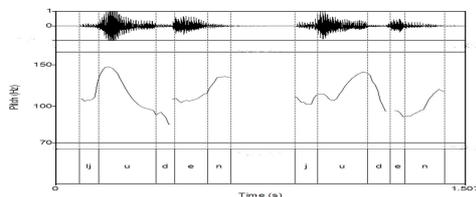


Figure 2: Realization of Accent 1 (left) and Accent 2 (right) in Southern Swedish; stress on the first syllable in both words.

Despite ample variation between Swedish dialects, there is always an earlier HL-pattern (=F0-fall) for Accent 1 compared to Accent 2. Very few dialects do not make any accent distinction. In Southern Swedish dialects, the fall associated with Accent 1 occurs early in the stressed syllable, whereas it occurs after the stressed syllable for Accent 2 ([9]). Accent 2 is considered to be the marked member of the accent opposition ([10]). All speakers in this study reside in the Southern part of Sweden. Figure 2 shows one example of the two words' accents in a Southern Swedish dialect.

1.4. Tone in Somali

Somali is a language that belongs to the Cushitic branch within the Afro-Asiatic language family. In earlier descriptions Somali has been reported to be a tone language. Later on it has been shown that the tonal system is typologically closer to a tone accent language [11]. Tone assignment is also associated with prominence [12]. The presentation of the tonal characteristics that occur with nouns are given here as an overview of the tonal nature of Somali. There is always one high tone in each noun – and not more than one – which depicts the highest level of stress and occurs on one of the last two vocalic morae. Placement of this high tone (´) on one or the other of these two morae can lead to a distinction in meaning, such as difference in gender (*ínan* “boy, son” vs. *inán* “girl, daughter”) or plurality (*éi* “dog” sing., *eí* “dogs” pl.). Thus, the accent location, which leads to a difference in meaning, is based on morphological rules. Those vocalic morae in a noun, which are not marked by a high tone are produced with a notably lower pitch and hence a lack of accent and a lesser degree of prominence.

1.5. Tone in Vietnamese

Vietnamese is a contour tone language with six lexical tones divided into two basic registers; high and low tones. The high tones are of high level F0, high rising and a broken fall-rise F0 (glottalised and abrupt rise). The low tones have a gradually falling, low dropping and curved F0 (gradual fall and rise, [13]). The pitch height and the direction of pitch movement are the two primary dimensions that contrast lexical items and words. In addition, tones are distinguished by voice quality, intensity and duration ([14]). However, direction of pitch movement, pitch height and voice quality are more important features than other tonal dimensions such as duration and intensity in tone recognition.

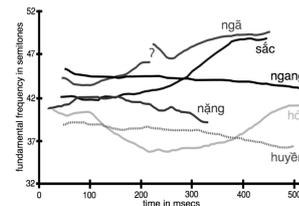


Figure 3: Vietnamese tones (adopted from [15])

2. The investigation

The present study is concerned with the acquisition of L2-tone accent distinction, as shown by its production. The accuracy of the two accent patterns produced by Swedish L2-speakers with Somali and Vietnamese as their L1 is examined by means of identification tests carried out by listeners with Swedish L1. The Swedish L2-speakers investigated here did not receive any specific training in the Swedish tone accents but instead had picked them up – or failed to do so – by uncontrolled exposure to Swedish L2 in everyday life. The identification rate of the stimuli produced by the L1-speakers of Somali and Vietnamese is compared between the two groups and also to the results of the identification of a matching set of stimuli produced by speakers with Swedish as their L1.

Recordings of two native speakers of a southern variety of Swedish and two native speakers of both Somali and Northern Vietnamese, learning Swedish as a second language, were used for this study. The recordings consisted of read speech and the sentences were prepared with four minimal pairs contrasted by word accents only (see Table 1). The sound of the eight target words produced by each speaker was carefully cut out from the recordings. This results in eight target words for each speaker.

Identification tests were carried out in two ways. Firstly, the stimuli produced by the Swedish L1-speakers and those produced by the L1-speakers of Somali were randomized and presented to 26 listeners with Swedish as L1. The presentation took place in a classroom where an acceptable HiFi-system was available. The informants had to perform a forced choice test, that is, they had to check on an answering sheet one of the words which they identified from the minimal pairs which were presented acoustically. Most, but not all of the listeners, had a Southern Swedish dialect. However, all listeners spoke a Swedish dialect, which does make an accent distinction. They were all students at Lund University and their age ranged between 19 and 41 years.

Secondly, the same stimuli produced by the Swedish L1-speakers and those produced by the L1-speakers of Vietnamese were randomized and presented to 20 listeners

with Swedish as their L1. The test was constructed in the learning platform MyMoodle. All listeners carried out the test on their own computers, using local loudspeakers or headsets. After listening to a stimulus, they had to check one of the two listed words, a forced choice test. They could listen to the stimulus as many times as they wanted, but could not go backwards in the test. The listeners' ages ranged from 27 to 74. About 3/4 of the listeners claim that they speak a dialect from the Southern or the South-West part of Sweden, but they all live in the south of Sweden.

Table 1. Target words in the minimal pairs, contrasting by word accent only, and their morphological structure: all words are stressed on the first syllable, where the difference in tonal accent is also found.

Accent 1	Accent 2
<i>fäster</i> 'attach', verb, present tense.	<i>fester</i> 'parties', noun, common gender, pl. indef.
<i>Oskar</i> , first name for a boy, noun	<i>åskar</i> 'having a thunderstorm', verb, present tense
<i>stegen</i> 'steps', noun, neuter, pl. def.	<i>stegen</i> 'ladder', noun, common gender, sing. def.
<i>tecken</i> 'sign', noun, neuter, pl. def.	<i>täcken</i> 'bed cover, duvet', noun, neuter, sing. def.

2.1. Data Analysis

The number of correct identifications of the target words produced by the two groups of L2-speakers were compared to each other and statistically analyzed. Correct identification ratings of the target words obtained from L1-speakers were added to that comparison. In this way t-tests for independent samples were used. In addition, the influence of the individual tone accents was taken into consideration.

2.2. Results

Figure 3 gives a good overview over the general results of this study. More detailed information and more specific results can be obtained from it as well. In the diagram, the mean correct identification rate (y-axis) across all listeners of the eight target words (x-axis) produced by the three different groups of speakers is presented in %. The columns are organized so that the members of a minimal pair are placed next to each other and target words carrying Accent 1 are labeled with "1" and those target words carrying Accent 2 are labeled with "2".

It can be stated that accent identification is more often correct, in general, if the stimuli were produced by L1-speakers of Swedish. The statistical results are $p < 0.005$ when compared to the correct identification rate of the stimuli produced by the L1-speakers of Vietnamese and $p < 0.001$ when produced by the L1-speakers of Somali. Identification rates do not differ between the two speakers for any L1 (Swedish L1: $p > 0.5$, Vietnamese L1: $p > 0.1$ and Somali L1: $p > 0.5$).

None of the accents are more often correctly identified for the stimuli produced by the Swedish L1-speakers ($p > 0.1$) and the Somali L1-speakers ($p > 0.5$). For the L1-speakers of Vietnamese, however, Accent 2-words were more often correctly identified than Accent 1-words ($p < 0.01$).

Furthermore, Accent 1-words were often misidentified as being Accent 2-words when produced by the Vietnamese L1-speakers.

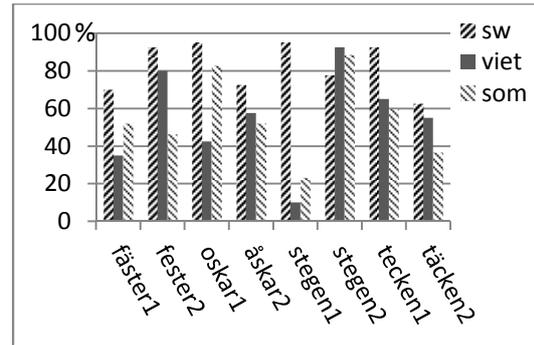


Figure 4. Mean identification rate (%) of the eight target words.

3. Discussion and Conclusion

The tone accents are generally identified with equally less accuracy for the stimuli produced by the L2-speakers of both Somali and Vietnamese, in comparison to the stimuli produced by Swedish L1-speakers. This leads to the conclusion that the tonal patterns produced to distinguish the tonal accents in L2-Swedish are not sufficiently similar to the expected patterns, as judged by the listeners, who are L1-speakers of Swedish. This is partly in line with the results in [7], which showed from an analysis of produced pitch patterns, that no systematic distinction between Accent 1-words and Accent 2-words were made for the L1-speakers of Vietnamese, but that words being part of a minimal pair were treated as homonyms. According to the same source, L1-Somali speakers were more systematic in making a difference in tonal patterns between Accent 1-words and Accent 2-words than the L1-speakers of Vietnamese. The current study shows, however, that when it comes to the identification of Accent 1-words and Accent 2-words, the observation of slight superiority of the L1-speakers of Somali when producing systematic variation is not strong enough to be acceptable. This means that L1-speakers of Somali were equally unsuccessful in producing the acceptable pitch patterns as the L1-speakers of Vietnamese. This also means, that L1-speakers of Somali – a tone accent language similar to Swedish – do not seem to have an advantage over the L1-tone language speakers of Vietnamese when acquiring the L2-pitch accent distinction in Swedish.

Placing the current results within the typological framework presented in [4] and Figure 1 – i.e. the further away the tonal type of L1 is from a L2 with lexical tone, the more difficult it is to process the lexical tones – and extending that framework within the hypothesis that L1-speakers of languages of a certain type of tone may process tonal characteristics in L2 of the same type better, it is suggested here, that in the case of L2 tone accent languages, L1-speakers of a tone accent language do not have an advantage over L1-speakers of a tone language.

The results here, however, support a modified version of the findings in [3], which stated that speakers with L1s with pitch accents are equally able to contrast tones in a foreign tone language as L1-speakers of a tone language. The modification lies in that this study's focus was on the acquisition of tone accents in L2. L2-speaker behaviour is nonetheless comparable to those in [3], in that no general difference can be found between the L1-speakers of a tone language and those of a tone accent language. A further study

would give some insight on whether the findings from both studies, [3] and the current one, also suggest that having any kind of tonal features related to the lexical items of an L1 is an advantage when acquiring tonal features related to the lexical items in an L2 in relationship to L1 speakers of an “intonation only”-language. In the case that L1-speakers of an “intonation only”-language would perform considerably less accurately, it would then lead to the assumption that no matter what kind of tonal feature – related to lexical items – an L1 possesses, their speakers would more easily acquire tonal features – related to lexical items – in L2, in comparison to those learners who do not have that type of L1.

In addition, there is more to say about how the speakers of the two L1s handle the individual word accents. It is clear from the identification tests that there is no overrepresentation of any of the identified Swedish tone accents for the L1-speakers of Somali. That is, both tone accents were produced equally successfully or unsuccessfully – and identified as such. That means that they did not produce a preferred tonal pattern similar to the pattern expected to occur for either of the Swedish tonal accents. There is no clear indication that tonal patterns in Somali could have an influence on the production of the patterns of the Swedish tonal accents, which would signal a transfer from L1 to L2. This needs to be investigated systematically. The two Swedish word accents can be distinctive when stress occurs on the same syllable in a word, a characteristic different from the word accent structure in Somali, where distinction is made by placing the same pitch accent pattern on different morae.

Most of the tonal patterns produced by the Vietnamese L1-speakers, however, were perceived as Accent 2-patterns: Accent 2-words were correctly identified to a greater extent, and words which should carry an Accent 1 were more frequently misidentified. An interesting question that arises here is whether one of the tones in Vietnamese resembles the Swedish Accent 2-pattern very closely (see Figure 2). In the case that there indeed is a close resemblance, the claims made in [6], that similarities or dissimilarities of the phonemic status and the phonetic features of a particular tonal pattern in L1 in relation to a pattern in L2 is more helpful for the ability to discriminate than the general linguistic status of tone in L1, are supported by this study. A systematic investigation is needed to relate and compare the tones in Vietnamese with the tonal patterns in Swedish, especially the tonal pattern of Accent 2.

Accent 2 is assumed to be the marked accent in Swedish ([10]), which means that the contour assigned to Accent 2 allows less tonal variation than it does in the unmarked case (Accent 1). Listeners indicated that some contours produced by L1-speakers of Vietnamese, fit within the restricted tonal framework for Accent 2. This also supports the idea that a corresponding tonal pattern adequate for Accent 2 in Swedish may exist in Vietnamese. In contrast, it has been shown in a previous study ([8]), that L2-speakers produced tonal patterns more adequate for Accent 1-words, a finding interpreted as being in agreement with the hypothesis that Accent 1 is the unmarked accent. One further argument favoring the idea of Accent 2-markedness is based on the assumption that L2-speakers, after having recognised the – for them – somewhat unusual Accent 2-pattern, overgeneralize its use.

In conclusion, the study on a limited number of L1-speakers of Somali and Vietnamese shows that for those speakers, being an L1-speaker of a tone accent language does not seem to be an advantage for the acquisition of the

appropriate tonal patterns in L2-Swedish over being an L1-speaker of a tone language. This is based on the finding that speech material produced by L1-speakers of the two languages is similarly often misidentified by L1-speakers of Swedish. Furthermore, there is a discrepancy between the number of correct identifications for the material produced by L2-speakers compared to that produced by L1-speakers of Swedish. This shows that the tone accent production and/or distinction by the L2-speakers is not as unmistakable as required for correct identification by L1-speakers of Swedish.

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