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Appropriate Tone Accent Production in L2-Swedish by L1-Speakers of Somali?

Mechtild Tronnier
Lund University, Sweden

Elisabeth Zetterholm
Linnæus University, Sweden

Abstract

It has been suggested that speakers with an L1 with lexical tones may have an advantage when it comes to perceptually discriminating between different tones in another tone language (Kaan, Wayland, Bao & Barkley, 2007). Other studies in L2-learning show that this is not entirely the case (van Dommelen & Husby 2009, So & Best 2010). A model of typological pitch prominence (Schaefer & Darcy, 2013) suggests that speakers of an L1 with a higher pitch prominence can perceive tonal contrast in another tone language better than those with an L1 of a lower pitch prominence. This study addresses the question: if Somali L1-speakers make a systematical distinction in the tonal pattern when producing Swedish words with the two tonal accents – as both languages are of similar pitch prominence according to Schaefer and Darcy – and also to what extent they produce a tonal pattern assigned to either one of the tone accents. The adequate distinction is identified as such by native speakers/listeners of Swedish. Results revealed that a big discrepancy still remains between the number of correct identifications of the stimuli produced by the L1-speakers of Swedish and those produced by L2-speakers of Swedish with Somali as their L1. Having a typologically similar L1 does not seem to give enough support to handle the tone accent distinction in Swedish L2 adequately.

The distinction between the two Swedish tonal word accents in perception and production is a known difficulty for learners of Swedish as a second language. Generally, familiar concepts, are easier to perceive and also to reproduce while unfamiliar concepts are more difficult to recognise and carry out. This also seems plausible for the acquisition of a sound system in a second language. Several studies have shown that speakers whose L1 has lexical tones may have an advantage when it comes to perceptually discriminating between different tones in another tone language (Kaan et al., 2007; Wayland & Guion, 2004), whereas speakers of a non-tonal L1 are less sensitive to lexical tone contrast (Wang, Behne, Jongman & Sereno, 2004). The type of tonal contrast in L1, however, seems to play a role when perceptually processing a tonal contrast in another language, in that speakers of an L1 with pitch accents show an ability to contrast tones in a foreign tone language to a comparable degree as L1-speakers of a tone language (Burnham, Francis, Webster, Luksaneeyanawin, Attapaiboon, Lacerda & Keller, 1996).

Schaefer and Darcy (2013) suggest a pitch prominence typology, which has implications for tone perception accuracy in that speakers of a tone language as their L1 are most likely to distinguish tones in another tone language to the highest degree, whereas L1-speakers of a pitch accent language are less accurate, but still performing better than speakers of an L1 with word stress and “intonation-only” characteristics, i.e. a language where pitch does not assist to distinguish meaning on a lexical but rather on a syntactic and/or pragmatic level.

Experienced teachers of Swedish as a second language have stated from their observations in sessions on pronunciation training that speakers with a tonal L1 have an advantage when it comes to mastering the difference between the two Swedish word accents.

Other studies have shown results that do not entirely agree that speakers of an L1 tonal language are generally better at discriminating tonal features in other (tone-)languages (van Dommelen & Husby, 2009; So & Best, 2010). So & Best (2010) examined the perception of Mandarin tones by L1-speakers of Cantonese, Japanese and Canadian English, all typologically different concerning the role of tone. They state that the general linguistic status of tone in L1 has less importance for identification of the correct Mandarin tone, than do similarities or dissimilarities of the phonemic status and the phonetic features of a particular tonal pattern in L1 as compared to the Mandarin Chinese lexical tones.

In van Dommelen and Husby it was found that L1-Mandarin Chinese speakers exhibited a higher ability to discriminate between the two tonal

word accents in Norwegian – which are similar to the Swedish word accents – than L1-German speakers; the latter group, however, showed results above chance level. In the corresponding identification task, listeners of both groups demonstrated considerably lower scores. For both groups, listening training in the two word accents seemed to have a minor effect on identification. The authors argue that familiarization with the two tones through perception training does not seem to have any influence on the improvement of discrimination or correct identification abilities.

Schaefer and Darcy's typology (2013), however, has an interesting implication for the current study, where the accuracy of the pitch accent production in L2-Swedish by L1-speakers of Somali is investigated. In a previous study (Tronnier & Zetterholm, 2013), we have shown that Somali L1-speakers produce a clearer and more systematic distinction of tonal patterns between words carrying either of the two Swedish word accents, when compared to L1-tone language speakers (Thai and Vietnamese) and the stress accent language Farsi. Twisting Schaefer & Darcy's typology down the path of the present study, one could ask if the acquisition of tonal features is easier if L1 and L2 are languages on the same level in the middle of hierarchy (i.e. if both are tone accent languages). A more detailed description of the role of tonal features in Somali is presented below.

In contrast to the studies referred to above, the concern of the current study is the acquisition of L2-tone accent distinction, shown by its production. The accuracy of the two accent patterns produced by Swedish L2-speakers with Somali 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 on the Swedish tone accents but rather picked them up– or not –by uncontrolled exposure to Swedish L2 in everyday life. The identification rate of the stimuli produced by Somali L1-speakers is compared to the results of the identification of a matching set of stimuli produced by speakers with Swedish as their L1. In addition, the listeners were asked to rank the degree of difficulty when deciding for one tone accent or the other during the identification test.

Based on the correct identification by the listeners as correlated with the degree of difficulty of identification, this study sheds light on how able L1-speakers are to produce appropriate tonal patterns in the right word in an L2 of a similar tonal type (i.e. not only make a systematical distinction in the tonal pattern when producing Swedish words with the two tonal

accents but to what extent they produce a tonal pattern assigned to either one of the tone accents) which are adequate and identified as such.

Swedish Tonal Word Accents

Swedish is a northern Germanic language with two tonal accents which are aligned to the stressed syllable in a word and traditionally named Accent 1 and Accent 2. The occurrence of either of the two accents depends on the placement of the stressed syllable in a word as well as the morphological structure of the word. The origin of the word also plays a role on which of the two accents it is assigned to. A word in which the lexical stress falls on the final syllable always carries an Accent 1. In a case, in which the stressed syllable is not in final position, minimal word pairs – being distinguished by tonal accent – can occur. According to Riad (1998), Accent 2 is the marked member of the accent opposition. There is a considerable variation of tonal patterns for the two accents among dialects, but in all dialects an HL-pattern (= F0-fall) occurs earlier for Accent 1 aligned with the stressed syllable than for Accent 2. There are, however, dialects that do not make an accent distinction at all, like the variant of Swedish spoken in Finland. 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 (Bruce & Gårding, 1978). Ambrazaitis and Bruce (2006) have shown that in word accent recognition, a late F0-rise during the vowel of the stressed syllable facilitates the identification of Accent 2 in Southern Swedish. Accent patterns for Southern Swedish are focused on here because the investigated speakers in this study reside in this part of Sweden. Examples of the Southern Swedish accent patterns are given in Figure 1.

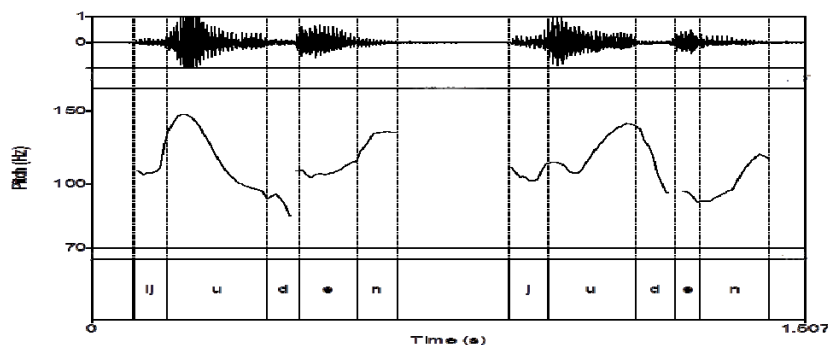


Figure 1. Realisation of Accent 1 (left) and Accent 2 (right) in Southern Swedish; stress on the first syllable in both words.

Tone in Somali

Somali is a language which 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 (Hyman, 1981). Tone assignment is also associated with prominence (Saeed, 1999). The presentation of the tonal characteristics that occur with nouns are given here as an overview over the tonal nature in 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, like difference in gender (*ínan* “boy, son” vs. *inán* “girl, daughter”) or numerous (*eì* “dog” sing., *éi* “dogs” pl.). Thus, the 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 notably lower pitch and hence a lack of accent and a lesser degree of prominence.

The role of the tonal accent pattern in Somali, however, seems to differ from its role in Swedish: in Somali the placement of the high tone conveys difference in morphology and meaning, whereas the variation of the tonal pattern aligned to the same place – i.e. the stressed syllable – leads either to a difference in meaning or a difference in morphology in Swedish.

Somali in Sweden

Based on political conflicts and the economic situation in the country of Somalia and the surrounding area, there has been a migration wave of Somalian L1-speakers across the world, including European countries since the mid-90s. The number of participants with Somalian as their L1 has increased in classrooms where Swedish as a second language is taught (Tronnier & Zetterholm, 2011). The current study is part of a larger foreign accent analysis, which aims for accessibility of pedagogical material for the teachers of Swedish as a second language.

THE INVESTIGATION

Material and Informants

In the current study the accuracy of the production of the Swedish tone accents by Swedish learners with Somali-L1 is investigated through identification tasks and degree of difficulty ratings, as provided by L1 speakers/listeners of Swedish. The degree of accuracy is interpreted in comparison with the results obtained from a similar test containing material from speakers with L1-Swedish.

The recordings, which serve as the basis for the identification- and rating tasks, contain Swedish speech of two L2-speakers of Swedish – who have Somali as their L1 – and two L1-speakers of the Southern Swedish dialect (Scanian from Malmö).

The two speakers with Somali L1 – one male and one female speaker – acquired the standardised proficiency level of Swedish that allows them to pursue High School studies which they were engaged in at the time of the recording. They have been living in Sweden for a number of years, and they were 21 and 22 years old. Neither of the speakers reported knowledge of any other Germanic language, but both spoke Arabic.

Both informants learned Swedish in the South of Sweden and therefore were mainly exposed to a Southern Swedish dialect by their teachers and in daily life outside their homes. It cannot be excluded that they were exposed to other varieties of Swedish through public media such as television and therefore also have knowledge on other dialects and their tonal patterns. They had not received any specific pronunciation training in the production of the two tonal word accents in (Southern) Swedish.

The two L1-speakers of Swedish – one male and one female speaker – were both students, 24 years old and had lived most of their lives in the south of Sweden, in Scania. They were informally classified as being the most genuine speakers of the Scanian dialect by their fellow students in the classroom.

The recordings for the Swedish L2-speakers were made in an accessible classroom with minimal interfering environmental noise at the school where they could be met. The two L1-speakers of Swedish were recorded in a studio environment. The recording device consisted of a portable digital audio recorder of the type Marantz PMD 660 and a Shure Wireless Lavalier microphone.

The recordings contained read sentences, a read text and some spontaneous speech: the description of a picture story. They contained

target words where all Swedish segmental phonemes were represented. Minimal pairs for prosodic contrasts, which are stress, quantity and the tone accents were also present. The recordings as a whole are part of a larger foreign accent investigation and for the current study only the minimal pairs, contrasting the two tonal word accents in Swedish were used. In that way, four minimal pairs produced by four speakers were extracted for the identification and rating test. The eight target words from the four minimal pairs are presented in Table 1. The resulting 32 stimuli were randomised and a second set of the same stimuli was created in a new random order for a repetition of the task.

Table 1. Target words 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, 3rd. pers. sing	<i>fester</i> ‘parties’, noun, utrum, pl. indef.
<i>Oskar</i> , first name for a boy, noun,	<i>åskar</i> ‘having a thunderstorm’, verb, 3rd. pers. sing
<i>stegen</i> ‘steps’, noun, neutrum, pl. def.	<i>stegen</i> ‘ladder’, noun, utrum, sing. def.
<i>tecken</i> ‘sign’, noun, neutrum, pl. def.	<i>täcken</i> ‘bed cover, duvet’ noun, neutrum, sing. def.

The two sets of the 32 randomised stimuli were presented to 26 listeners with Swedish as L1. Most, but not all of them, had a Southern Swedish dialect. All listeners had 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. The presentation took place in a classroom where an acceptable HiFi-system was available and the informants had to perform a forced choice test, that is, they had to check one of the words which they identified from the minimal pairs acoustically presented, on an answering sheet. A brief explanation for each word was also given, since in some minimal pairs, the two distinct words are spelled the same (see also Table 1).

Each target word was presented to the listeners four times. They also had to check on a scale from 1 to 6, of their experienced difficulty in deciding which word of the pair had been played, where 1 represented an

easy decision and 6 a difficult decision. To avoid an ordering effect, the presentation of the word pairs on the answering sheet was reversed in the repetition, e.g.

- in set one, for Stimulus X, which contains the recording of the word *fester*, the answering sheet looked like this:

fester <input type="checkbox"/>	fäster <input type="checkbox"/>
(partyn)	(limmar fast)

- in set two, for Stimulus X, which contains the recording of the word *fester*, the answering sheet looked like this:

fäster <input type="checkbox"/>	fester <input type="checkbox"/>
(limmar fast)	(partyn)

In both sets “(limmar fast)” ‘attach’ and “(partyn)” ‘parties’ are the explanations.

Data Analysis

The answers obtained from the listeners were statistically analysed foremost for correct identification of the target words in relationship to the speakers’ L1. Further steps of analysis were carried out, having a closer look at multiple factors, like accent type (i.e.: Is accent 1 generally more correctly identified than accent 2, or v.v.? And is any accent more correctly identified for speakers of either L1?); individual speaker (i.e.: Are some speakers’ accent patterns more inaccurately identified than others within the group with the same L1?); and coherence for the repetition (i.e.: Does the identification rate vary between the two sets? And is there a left or right side preference when marking the answer on the answering sheet? See ordering effect mentioned above). Preferred choice of any of the two accents within each language group was also tested. Hereby an ANOVA for multiple factors was applied.

Perceived degree of difficulty of identification between the data produced by L1- and L2-speakers was also statistically analysed with a t-test for independent samples. The perceived difficulty to identify either of the accents in relation to the L1 of the speakers was also taken into consideration and analysed with an ANOVA. Furthermore, a correlation between experienced degree of difficulty for identification and the proportion of correct identification for the stimuli was also investigated.

RESULTS

Overall Recognition. The diagrams in Figure 2 give a good overview of the general results, which show that correct identifications are significantly higher for the target words which were produced by the L1-speakers of Swedish (speaker 3 & 4, $p < .001$).

A clear trend of misidentification occurred for the stimuli produced by the L2-speakers, where stimuli with an intended accent 2 were often identified as accent 1. In other words, accent 2 stimuli were similarly frequently identified as accent 1 words as accent 1 stimuli ($p > 0.6$). This was not the case for the stimuli of the L1-speakers, as they were more often correctly identified.

The material produced by the speakers within each L1-group was accurately identified ($p > 0.5$ for both L1) with equal frequency, i.e. no significant difference of identification between the material produced by the two speakers within each group occurred.

There was no ordering effect on the correct identification of the target words. This assumption is based on the result, that no significant difference of correct identification occurred between set 1 and set 2, the latter a repetition of the same stimuli found in set 1 but in a new random order ($p > 0.2$).

Degree of Perceived Difficulty. The stimuli produced by the speakers with Swedish L2 were generally perceived to be more difficult ($p < 0.0001$), which is also clear from the diagrams in Figure 3.

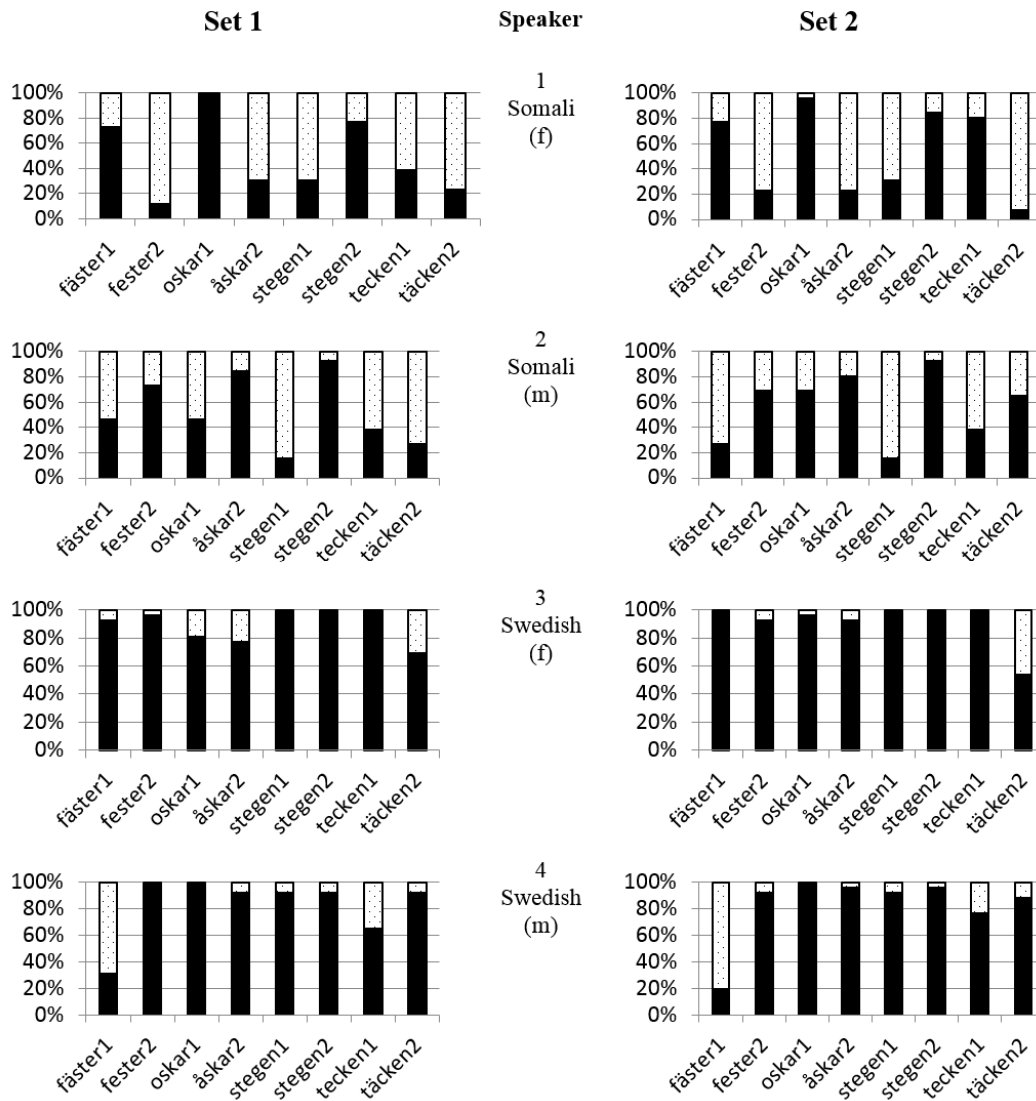


Figure 2. Mean identification rate (y-axis) of the eight target words (x-axis) across the 26 listeners, sorted by the different speakers and the first set (left) and a second set of the same stimuli – a repetition – (right), where the filled part (lower) of the columns represents the correct answers and the dotted part (upper) the inaccurate answers

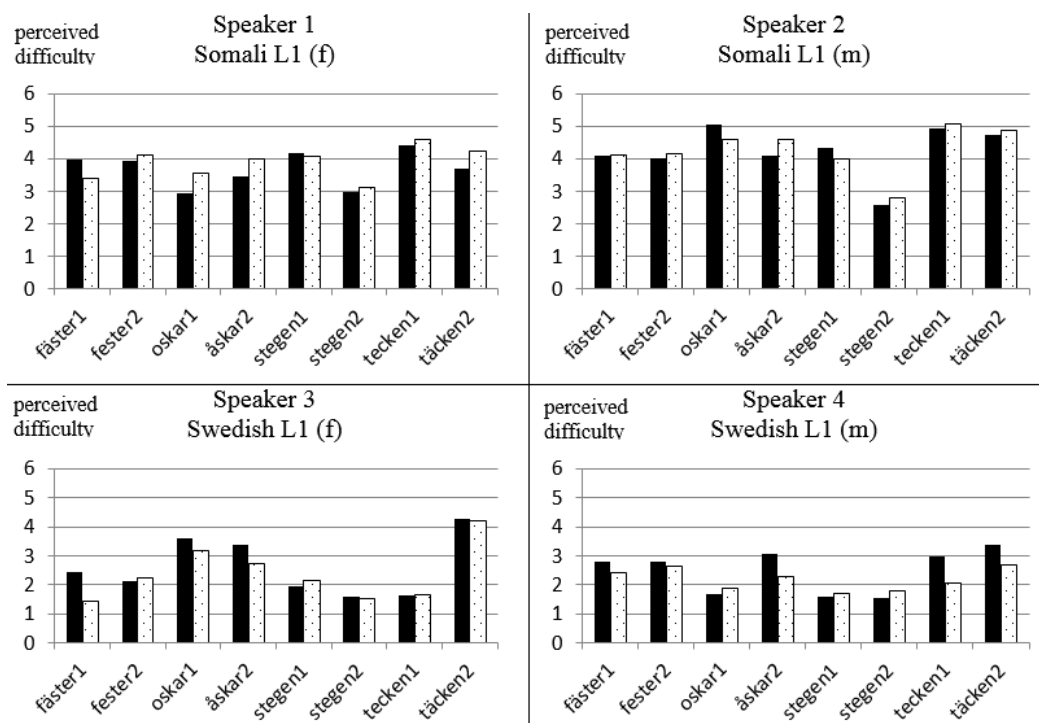


Figure 3. Mean values of perceived degree of difficulty on a scale 1 (easy) to 6 (difficult) (y-axis) across the 26 listeners when identifying the eight target words (x-axis) produced by the four different speakers, where the filled (left) column for each stimulus presents the stimuli of set 1 and the dotted (right) column set 2.

Correlation Between Perceived Difficulty and Inaccurate Identification. There is no significant correlation but rather a trend between the perceived difficulty of classification of stimuli as Accent 1 words or Accent 2 words and the correct choice in the identification task. As can be seen in Figure 4, there is little variation in the perception of difficulty, which is perceived as being rather easy, for those stimuli which are identified correctly in most cases (left side in the diagram). The results are more scattered for the stimuli, being perceived as being difficult to classify, as some of them are identified correctly more often than others (the scatter cloud on the right side in the diagram). Due to that kind of division of the data, the correlation is not significant. It should however be pointed out, that the less scattered left side of the diagram contains data points related to stimuli produced mainly by L1-speakers (mean = 2.3, sd = 0.7) and the more scattered part on the right side mainly those of L2-speakers (mean = 4.1, sd = 0.6).

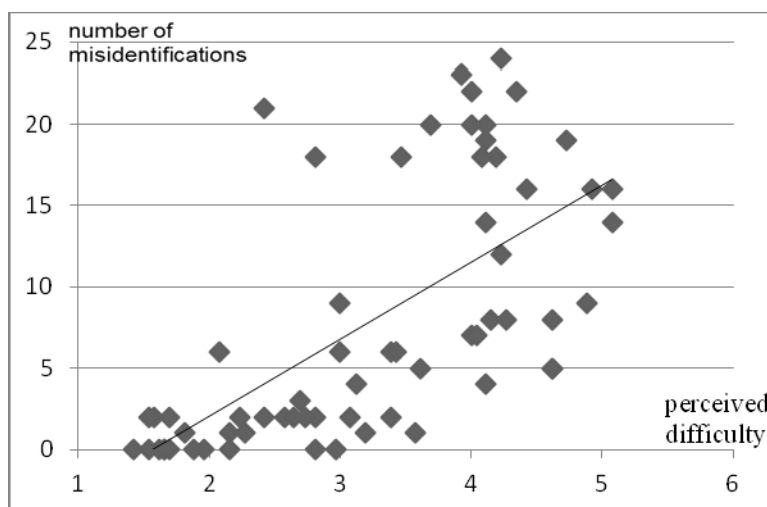


Figure 4. Number of inaccurate identifications across the 26 listeners (y-axis) and mean values of perceived degree of difficulty on a scale 1 (easy) to 6 (difficult) (x-axis) and a trend-line.

DISCUSSION

The results confirm that the tonal patterns representing the two different Swedish word accents, which were produced by the L2-speakers of Swedish with Somali as their L1 are not comparable with what is required by the listeners with Swedish L1 to identify the intended word. It should be noted that not all stimuli produced by the Swedish L1-speakers were correctly identified either. The rate of correct identification, however, is much higher in the latter case. As mentioned above, not all Swedish dialects make the accent distinction, but rather rely on contextual cues in the discourse to identify the correct words. This also indicates that correct word accent production is not a major cue to comprehension of running speech in Swedish, but is instead a typical sound characteristic. It can be seen in Figure 2 that for speaker 4 (Swedish L1, m) the first word *fäster1* 'attach', which bears an Accent 1, is not correctly identified by most listeners in the first presentation or in the repetition. The stimulus was produced with a very monotonous pitch and as the word was presented without context, no semantic cue could point to the appropriate word.

Perceived difficulty was not linearly correlated with wrong identifications. Most of the stimuli which were rated as being easily identified were also to a great extent correctly identified. These stimuli originated mainly from the L1-speakers. Most of the stimuli produced by the L2-speakers were rated as being difficult to identify, but some of them

were equally correctly identified as those stimuli produced by L1-speakers. Other stimuli produced by L2-speakers were, however, misidentified to a great extent. Thus, greater perceived difficulty may also be based on other pronunciation characteristics produced by the L2-speakers, not only the factual pitch pattern.

A tendency for an accent 1-preference is found for the stimuli produced by the L2-speakers, including accent 2-stimuli. This leaves room for a chain of two interpretations. In that way, the tonal structure of Somali – in which no lexical contrast due to different tonal patterns aligned with the same syllable occurs, as it does in Swedish; but rather, a difference in placement of a high pitch occurs instead – is the basis for the lack of two distinct separate pitch patterns as required in Swedish when produced by speakers with Somali as their L1.

As a consequence, an L1-listener's behaviour in agreement with the markedness hypothesis for accent 2 (Riad, 1998) could have arisen, i.e. when a pitch contour is not close enough to a pattern acceptable for an L1-accent 2, the category that allows a more flexible pitch contour – namely accent 1 – is identified.

Alignment of the high tone at a rather specific position in relation to the entire accented vocalic mora is probably not equally important in Somali as it is in Swedish. This leads to the discussion of the Schaefer and Darcy's pitch prominence typology as presented in the Background section of this contribution. Schaefer and Darcy listed a hierarchy with tone languages having the highest level of pitch prominence and "intonation only"-languages coming up with the lowest level. In that hierarchy, both Swedish and Somali would be placed at the same level, pitch accent languages, just below the tone languages, because for both languages "...pitch is exclusive..." (p.8). It should be reminded that their model is based on perception studies, unlike this contribution which is based on an examination on untrained tonal accent production. It is clear from this study, however, that although both Swedish and Somali belong to the same level in the hierarchy that the distinction of the tonal features in Swedish is not acquired, or vocalised, to an adequate extent by the Somali L1-speakers to signal difference in meaning. There is obviously more than a similar hierarchy level needed to acquire the ability to distinguish. And one argument points back to the initial sentence in this paragraph, namely that in Somali, placement of a pitch gesture on a particular syllable leads to difference in meaning, whereas in Swedish difference in meaning is depending on the timing and alignment of a particular pitch gesture within the same syllable.

A potential extension of the discussion on the pitch prominence typology and its implication on tonal acquisition in L2 could be based on similar testing as performed in this study which also includes L2-stimuli produced by L1-speakers of a tone language and word stress languages. Maybe such a comparison could give a better indication on how successful L2-speakers of Somali are in producing Accent 1 vs. Accent 2 distinction in L2-Swedish

One question still remains: do familiar tonal gestures rather than having an L1 of similar tonal typology facilitate the acquisition of an adequate ability to produce an Accent 1/ Accent 2 distinction in L2-Swedish? Such familiar gestures could have a lexical or intonational/pragmatic function. A possible starting point for training the contrast in Swedish L2 would therefore be to make the student aware of a tonal gesture in L1 which is similar to one of the Swedish tonal gestures. This only holds in the case that a similar tonal gesture occurs between L1 and L2. This suggestion is a sequel based on the findings by So and Best (2010) on tone identification in Mandarin that mere typological similarities between L1 and L2 are less important for identifying the correct tone than similarities or dissimilarities of the phonemic status and the phonetic features of a particular tonal pattern in L1.

CONCLUSIONS

It has been shown in this study that the ability of L1-speakers of Somali to perform better when making a difference in L2-Swedish tonal accents in comparison to Swedish L2-learners with other L1 –which has been stated in previous results – does not suffice for native listeners to distinguish between the meaning of words contrasted by this feature only. Having Somali as L1, which is a tone accent language similar to Swedish, is hence not the only factor that helps to acquire the adequate tonal distinction. It is argued, that the way tone accent languages handle their tonal accents are too different from one another to give support to the acquisition of their adequate application in L2. Due to the difference between the tonal accents in these two languages, Somali L2-learners of Swedish may not be able to recognize the tonal patterns and furthermore manage the contrast that comes along with it.

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