

# UNGRAMMATICAL PROSODY DOES NOT HINDER POSITIVE EVALUATIONS

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## ABSTRACT

This paper presents a study of L1 speakers' evaluations of speech by L2 speakers of Swedish. The evaluations concern degree of foreign accent and comprehensibility, as well as interpretations of emotions and attitudes of the L2 speakers. Furthermore, the evaluations are correlated with measurements of F0-variation and F0-level.

Apart from L1 speakers being able to recognize a non-native accent in L2 speech, they often notice other factors such as comprehensibility and expression of emotions and attitudes when judging non-native speakers. The present study concerns whether there is a correlation between these factors and with the acoustic variables F0 level and F0 range.

The results show that speakers who are evaluated as having a high degree of foreign accent and a low degree of comprehensibility are not necessarily negatively judged in terms of expression of attitudes or emotions. Furthermore, speech which is judged as expressing positive emotions and attitudes tend to have more varying F0 compared with speech which is judged to express negative emotions. The results are of interest for second language teaching with a special focus on pronunciation and prosody.

**Keywords:** Prosody, comprehensibility, foreign accent, attitudes.

## 1. INTRODUCTION

The purpose of this paper is to study how native (L1) speakers of Swedish evaluate non-emotional speech of second language (L2) Swedish speakers on scales of emotions, attitudes, comprehensibility and foreign accent, and to relate these evaluations to acoustic measures of F0-variation and F0-level. Comprehensibility is described as *The ease or difficulty a listener experiences in understanding an utterance* [8]. The results can give new insights into possible relations between accent, comprehensibility,

attitudes and F0-variation on the basis of L1 listeners' judgements.

The research questions are the following:

- How do L1 Swedish listeners evaluate L2 speakers of Swedish on degree of foreign accent and degree of comprehensibility?
- How do L1 Swedish listeners evaluate L2 speakers of Swedish on emotional and attitudinal scales?
- How are evaluations of emotions and attitudes related to evaluated degree of foreign accent and comprehensibility?
- How are the evaluations of emotions and attitudes related to F0-variation and F0-level?

## 2. BACKGROUND

### 2.1. Cross-language evaluation

Perception and evaluation of foreign accented speech does not only concern L2 speakers' correct or incorrect productions of segments and of lexical or grammatical prosody of the language to be learned. An important question also is what effects transfer from the speakers' L1-prosody has on the listeners. If a learner uses L1-prosody when speaking in an L2, the prosody can be misinterpreted by the native listener [3, 6, 9, 10]. The misinterpretations can be about emotions or attitudes, and misinterpretations can have serious effects on communication in different professional contexts such as job interviews, business negotiations, court hearings or politics, or in communication in general. There can be individual differences, but different languages can also vary when it comes to the average F0 level and range [10, 11, 12]. Previous studies have shown that a speaker with a wider F0 range can be interpreted as conveying a very positive attitude by a speaker with a narrower F0 range, and vice versa [9].

In contrast to a paper by Abelin & Allwood [1], that studied how L1 speakers of different languages

interpreted Swedish emotional speech, the present paper studies how L1 speakers of Swedish interpret non-emotional speech of L2 speakers of Swedish. In other words, can there be something intrinsic in L2 accented prosody which gives rise to emotional interpretations among L1 speakers?

There is generally no clear correlation between foreign accent and comprehensibility [8] even though listeners are quite sensitive to accent and are able to identify a foreign accent very quickly [9], for example listening to one short word [14]. Accented speech can be fully comprehensible in conversation with both native and non-native speakers, and listeners' evaluations of accented speech is often influenced by different factors such as familiarity with the accent and the content as well as language proficiency and linguistic awareness [16]. Judgement can also change over time depending on factors such as increased interaction with L2 speakers and familiarity with different accents.

## 2.2. Brief description and comparison of prosody in the participants' languages

Even though we do not intend to compare the effect of different L1s of the L2 speakers under study, it is relevant to present some prosodic facts of Swedish and the participants' L1s. First, in Swedish, the target language, quantity distinction in stressed syllables, tonal word accents and word stress are of importance. Tonal patterns including segmental duration and F0 variation make sense for perception of prosodic phrases in Swedish [7]. Questions do not typically have a final F0-rise.

Finnish is a language with word stress fixed on the first syllable and quantity distinctions occurring in both vowels and consonants, while quantity is not correlated to the stressed syllable and stress is not realized tonally. Non-emotional speech often has a descending pitch contour with a very low pitch at the end of the utterance [15].

In French, phrase accent, as well as word stress, is realized on the last syllable and there is no distinctive quantity distinction [7].

In Arabic, word stress is on the final or penultima syllable depending on the word structure. Studies of Arabic dialects indicate some differences in prosodic structure, e.g. pitch range, pitch dynamics, register and rhythmic structure [5].

Word stress is a distinctive feature in Spanish. There is a duration difference between stressed and unstressed syllables. Yes-no questions typically have a final F0-rise [2].

## 3. METHOD

### 3.1. Material and participants

Five short recordings (1-2 sentences) of read non-emotional speech from the Bannert database [4] were chosen for listening tests. The speakers had Finnish (subject A), French (subject B), Arabic (two subjects, C and D) and Spanish (subject E) as their L1. Speakers C and D were pre-classified as monotonous and speaker E was pre-classified as having non-grammatical final rise in questions, by Bannert [4]

The listener group consisted of 16 untrained native Swedish speakers of varying ages, genders and educational backgrounds. They listened to the sentences in front of a computer, they did not get any information about the speakers' L1 and listeners did not report familiarity with any of the accents after the experiment. They were not asked about their attitude towards non-native speakers in general.

### 3.2. Procedures

The listeners filled in a form evaluating comprehensibility, degree of foreign accent, and the expression of different emotions and attitudes, all on a Likert scale 1–4, where 1 stood for low degree and 4 stood for high degree of each variable. Each of the five speakers was evaluated on a different page. There was no training phase, but the listeners received the same instructions before the test. The evaluative dimensions were the following eleven: *friendly*, *polite*, *helpful*, *happy*, *trustworthy*, *surprised*, *energetic*, *aggressive*, *uninterested*, *sad* and *contemptuous*. Each listener listened to all five speakers and they could listen as many times as they wanted. We classified *friendly*, *polite*, *helpful*, *happy*, *trustworthy*, *surprised* and *energetic* as positive dimensions, and *aggressive*, *uninterested*, *sad* and *contemptuous* as negative dimensions. Not all dimensions were analysed in this paper.

Each utterance was also measured for F0-variation, i.e. the difference between maximum and minimum F0, as well as mean F0 level for each speaker's utterance, using Praat [13].

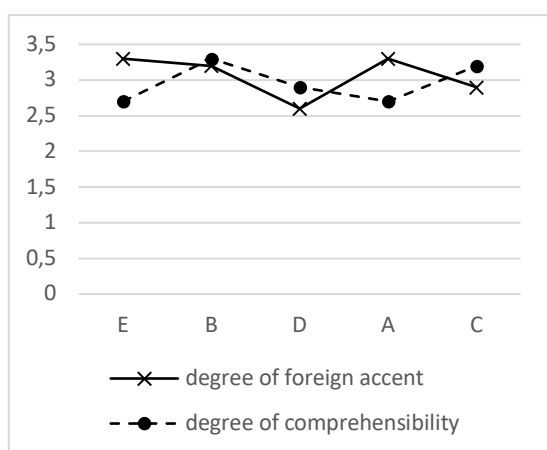
In total the study resulted in 1050 data points of which 810 were analysed.

### 3.3. Analyses

The results from evaluations of comprehensibility and degree of foreign accent were correlated with the results of evaluations of emotions and attitudes. The results of evaluations of emotions and attitudes were correlated with the acoustic measurements of F0-variation and F0-level.

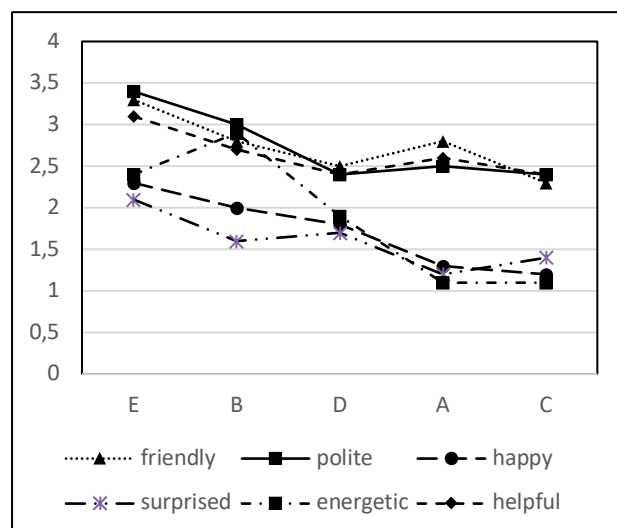
#### 4. RESULTS

The differences between speakers presented below represent tendencies, since there were no statistically significant differences found, due to a small number of speakers. The correlations between some of the variables were however significant, as analysed with regression analysis. The results of the listeners' evaluations of degree of foreign accent and comprehensibility are shown in Figure 1. It shows that speakers A and E who were judged lowest on degree of comprehensibility were judged high on degree of foreign accent. In conclusion, when degree of foreign accent overrides a certain value, comprehensibility tends to decrease. The speakers C, D and B were each judged higher on comprehensibility than on degree of foreign accent.



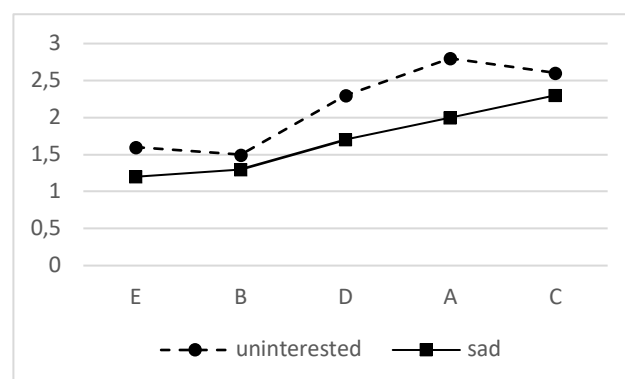
**Figure 1:** Evaluations of degree of foreign accent and comprehensibility on a scale 1-4. 16 listeners.

When analysing attitudes to speakers, B and E were evaluated highest on positive adjectives and lowest on negative adjectives. Speakers A and C were evaluated highest on negative adjectives but lowest on positive adjectives, see Figure 2 for positive dimensions and Figure 3 for negative dimensions. Speaker D is evaluated in between on both negative and positive adjectives. It can be seen in Figure 2 that speaker E (who is the speaker with ungrammatical final rise in questions) has received most positive evaluations.



**Figure 2:** Evaluations of positive emotions and attitudes on a scale 1-4. 16 listeners.

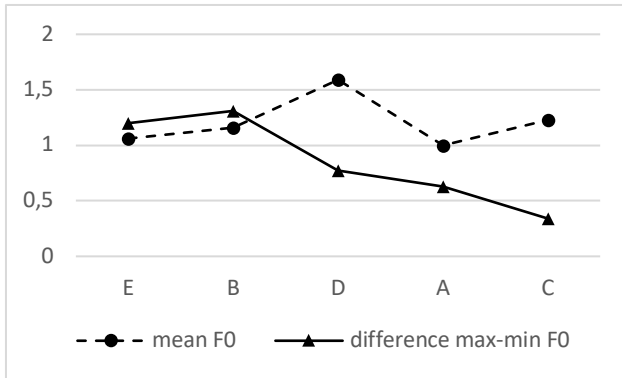
Figure 3 below shows evaluations on two negative dimensions: uninterested and sad.



**Figure 3:** Evaluations of negative emotions and attitudes on a scale 1-4. 16 listeners.

Comparisons between evaluations of foreign accent, comprehensibility and emotions and attitudes showed no positive or negative correlation. However, speaker E, who had the highest rating on foreign accent and lowest rating on comprehensibility, was rated highest on positive emotions and lowest on negative emotions. So, a speaker with a strong accent and low comprehensibility can be given very positive emotional judgments.

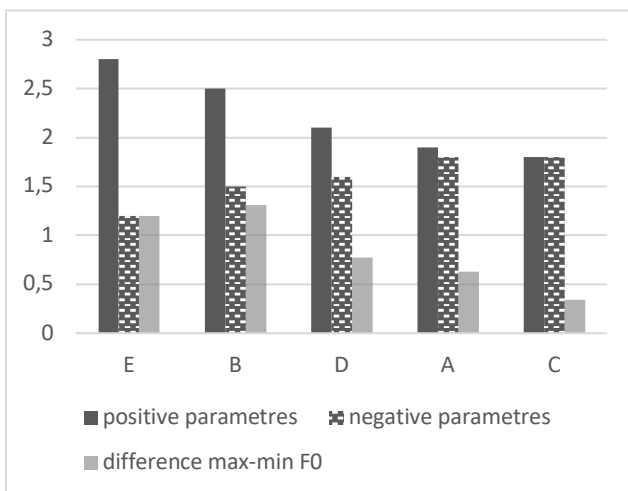
Acoustic measures of F0 variation and mean F0 level, see Figure 4, show that B and E have the largest F0 variation (measured as difference between maximum and minimum F0), A and C have the smallest F0 variation. D scores are in between again. For mean F0 level, speaker D has the highest F0 mean.



**Figure 4:** Measures of mean F0 level and difference between maximum and minimum F0. 16 listeners.

There is a significant negative correlation between degree of perceived uninterest and difference between maximum and minimum F0, that is F0 range ( $r^2$  0.8569,  $p=0.0240$ ), cf. Figures 3 and 4. Furthermore, there is a significant positive correlation between degree of perceived energy and F0 range ( $r^2$  0.9133,  $p=0.0111$ ), cf. Figures 2 and 4.

The next figure, Figure 5, show the means for evaluations on positive and negative parameters, in relation to difference between maximum and minimum F0, for the five different speakers E, B, D, A and C.



**Figure 5:** Means of evaluations of the five different speakers on three parameters. 16 listeners.

In Figure 5 we can see that there is a weak negative correlation between F0 range and negative judgements ( $r^2$  0.6976,  $p=0.0783$ , not significant), and that there is a significant positive correlation between maximum and minimum F0 and a larger number of positive judgements ( $r^2$  0.8518,  $p=0.0254$ ). In other words, there is a tendency that speakers with

a varied intonation are judged more positively by the listeners.

## 5. CONCLUSIONS

Speakers were evaluated more positively when they had a varying F0 (speakers E and B). They were evaluated more negatively when they had a more monotonous F0 (speakers A and C). If the monotonous speaker had a higher F0, he was evaluated higher (speaker D). Thus, high F0 variation and high F0 level can give positive responses from listeners.

Concerning degree of foreign accent and degree of comprehensibility these measures did not correlate with positive and negative judgements. Speaker E was judged to have quite a low degree of comprehensibility and the highest degree of foreign accent but was nevertheless evaluated the most positively and the least negatively (together with speaker B). E was the speaker who had been beforehand classified as having ungrammatical final rise in questions. Low degree of comprehensibility and high degree of foreign accent thus does not hinder positive evaluations of attitudes. The positive evaluations could emanate from varying F0.

The result for speaker E, with Spanish as L1, coincides well with the results of Aronsson [2, 3] who found that Spanish question intonation was interpreted as friendliness by Swedish L2 speakers of Spanish.

Another issue is whether the listeners could identify the L1 of the speakers and because of this have more or less positive attitude to them. However, earlier work on Swedish [6] shows that L1s of speakers with a foreign accent are generally difficult for untrained listeners to identify.

The present study is of limited scope, only having five speakers and 16 listeners. However, the speakers are evaluated on a total of 13 parameters (on a scale 1–4) resulting in a high number of data points which were analysed. As we did not study attitudes to languages but attitudes to different speakers, we did not consider it necessary to have many speakers of each language. We believe that the results are interesting for developing further studies on the interpretation of prosody in the speech of second language learners of Swedish. Further research could also study the combined effects of other prosodic and segmental features, as well as controlling for sociolinguistic variables.

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