

PERCEPTUAL CRITERIA FOR DIFFERENTIATING BETWEEN DIALECT TYPES

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INTRODUCTION

The Swedish Prosody Project is continuously engaged in appraising and revising the model that was originally developed and described by Gårding (1973), Bruce (1977) and Gårding and Bruce (1979, 1980). This model, which is mainly production oriented, derives and generates dialect prosodic variants in Swedish from a small number of grammatical parameters. Four dialect types are recognised, denoted 1A, 1B, 2A and 2B, represented by Malmö, Dalarna, Stockholm and Göteborg respectively. These are differentiated by the timing of word accents and sentence accent (focus) in each type. For example, type 2A has the earliest word accent timing and type 1B the latest, types 2A and 2B have a high focus position which gives two-peaked accent 2 on words in focus position while in type 1A and 1B the corresponding words have one peak.

Recent work has been devoted to the problem of whether intermediate types can be described and generated with the aid of the model. This report queries whether the number of types corresponds to perceptual impressions or whether more types are needed. At the Trondheim prosody symposium we assumed from an analysis of intermediate forms that the Småland dialects, with Växjö as prototype, could also be considered a separate Swedish dialect type. We denoted it 2AB. The 2 refers to the two-peaked accent 2 in focus, A to the sentence accent manifestation which is similar to Stockholm (2A) and B to the word accent manifestation which is similar to Göteborg (2B). This is illustrated in fig. 1 which shows observed tonal patterns for the various dialects.

In Växjö speech the word accent has a relatively late timing, which may explain the obvious F_0 rise during the post-accent vowel when the sentence accent falls on sentence-final accent 2 words (solid line in Fig. 1). This also occurs in Göteborg speech, where the sentence accent manifestation is

distinct from the word accent just as in Växjö. When the focus is on the final word, there is presumably insufficient time left for signalling the sentence accent by any other means than by a rise. Figure 1 also shows that the fundamental frequency curve for Växjö is similar to Stockholm, but the 70 ms timing shift means that the word accents are manifested differently in the two dialects. Figure 2 clearly shows how this difference of timing affects in both dialects.

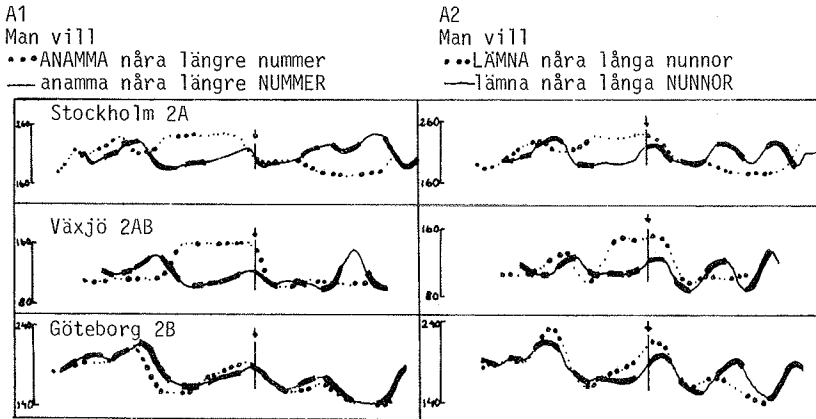


Fig. 1. Representative fundamental frequency curves for sentences with accent 1 and accent 2 words respectively. Examples of initial and final sentence accent location are given for both sentences. The thicker lines indicate vowels, thin lines consonants.

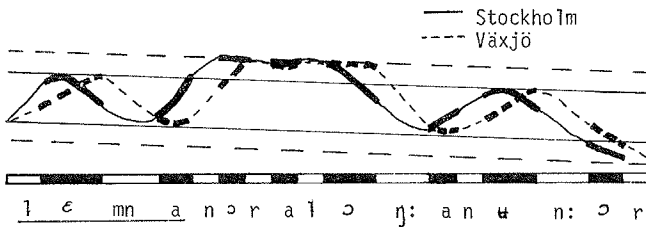


Fig. 2. Normalized fundamental frequency and duration patterns for a sentence with accent 2 words. Time scale: 1 cm = 0,1 s

Despite obvious similarities in the outer configuration, Fig. 2 shows how the focused accent 2 word lämna is located in the rising-falling tonal movement in the Växjö pattern whereas the corresponding word in the Stockholm example is falling-rising. The difference should have some perceptual

significance. The observation leads to the question as to whether it is so important perceptually that it is justifiable to consider these two variants to be members of quite different dialect categories.

MATERIALS AND METHODS

To obtain an answer to this question ten subjects were recorded via a laryngograph, which enables pitch information from the voice source to be heard prior to the supraglottal filtering. The informants represent dialectvariants from Växjö (2AB), Kalmar (2A), Stockholm (2A), Göteborg (2B), Malmö (1A) and Krisitanstad (1A). The utterances that were compared are the proverb när katten är borta dansar råttorna på bordet ("when the cat's away the mice will play") and contrived sentence man anammar lundamodellen ('one absorbs the lund model") consisting virtually of sonorants only to show up the timing of word and sentence accents. Similar conditions (only sonorants and comparable vowel qualities) also pertain in the utterances used for the tone curves of Figs. 1 and 2.

The proverb, pronounced with even intonation was used in a listening test. One or two representative renderings from each dialect were selected and paired at random to provide 25 stimuli. Eleven listeners representing various dialects have judged whether the renderings in each pair can be classed as belonging to some dialect area or not.

RESULT AND DISCUSSION

The results of the listener test are given in Fig. 3. The horizontal axis contains the stimuli comparing paired dialect variants. The vertical axis records the number of listeners who made "same dialect" judgment for each pair.

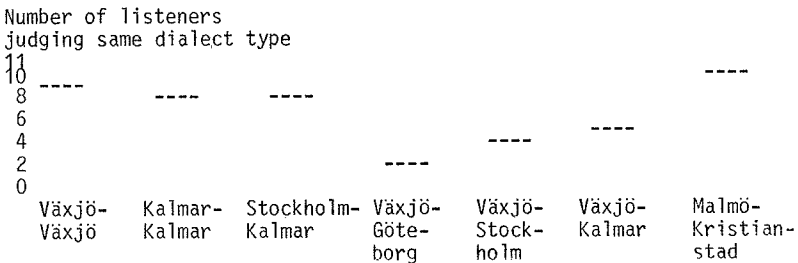


Fig. 3. Result of the listener test. Pairs of dialects are given on the horizontal axis. The vertical axis represents the number of listeners who judged the dialects in each pair as belonging to the same dialect type.

For stimuli comparing two speakers known to be of the same dialect, the "same dialect" judgements are high. For example, the two Våxjö informants were judged to have the same dialect by 10 of the 11 listeners.

The Våxjö and Göteborg renderings were judged to be the same dialect by only 1 listener. The similar word accent do not appear to be sufficient perceptual ground for assigning two variants to the same dialect type if the sentence accent patterns when the sentence accent is located finally or medially in the sentence. Gårding and Bruce (1978) have also concluded that the sentence accent pattern is the primary criterion for differentiating dialects.

The Våxjö renderings were also compared with the two variants of the 2A dialects type, Stockholm and Kalmar, where the prosodic pattern is similar. These were judged to belong to the same dialect as Våxjö by 3 and 4 listeners respectively. It thus seems to be a more difficult task to differentiate Våxjö from Stockholm or Kalmar than Våxjö from Göteborg. Nevertheless, Våxjö tends to be classed as a separate dialect. This merits further investigation with more informants and more listeners. However, the present report does indicate perceptual justification for considering that the Småland dialects, with Våxjö as prototype, constitute a separate dialect type.

The Malmö and Kristianstad dialects (tonal patterns in Fig. 4) were also compared in the listener test. According to the model, they are both classed as type 1A. The result of the listener test shows that they are also perceptually similar, 9 of the 11 listeners judging them to be the same dialect. A closer look at the tonal pattern reveals a slight difference of timing, just as there was between Våxjö and Stockholm. This is illustrated in Fig. 5.

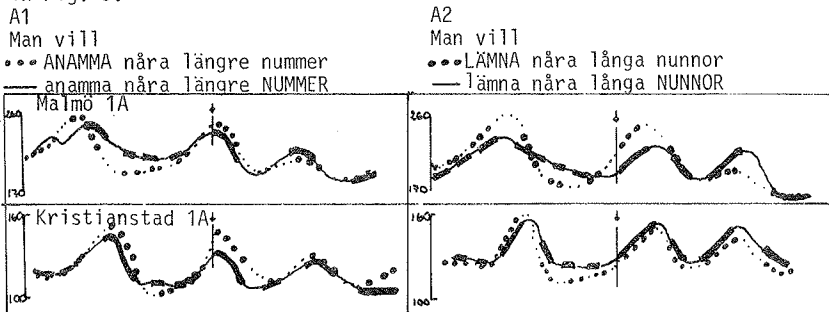


Fig. 4. Representative fundamental frequency curves for sentences with accent 1 and accent 2 words respectively. Examples of final and initial sentence accent location are given. Thicker lines indicate vowels, thin lines consonants

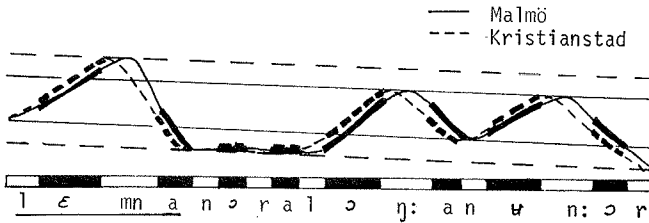


Fig. 5. Normalized fundamental frequency and duration patterns for a sentence with accent 2 words and initial focus. Time scale: 1 cm = 0,1 s.

The timing difference is a mere 30 ms and has no effect on the tonal pattern of the word accents. There was, however, a clear effect for Växjö and Stockholm, where the timing differences was more than twice as large. Since the Malmö and Kristianstad dialects are classed as the same dialect type by the listener test, there is presumable a critical limit for whether or not timing shifts differentiate between dialect types.

The timing of the F_0 fall in accent 1 and accent 2 in one and the same dialect was studied by Bruce (1977). The timing of the high turning point for both accents was varied continuously in a synthetic rendering of *inga malmer*. This sentences can be interpreted as accent 1 ("no ores") or accent 2 (forname and surname, "Inga Malmer"). The ensuing listener test revealed a critical region with a timing difference of 20–30 ms where it was difficult to differentiate between the accents. In view of this result, it is not unlikely that a timing shift of about 70 ms between two otherwise similar tonal patterns is perceptually relevant and the variants would be assigned to different categories.

The result of the present investigation shows the perceptual importance of the tonal movement of the accented syllable. The considerable timing difference between Växjö and Stockholm yields quite different word accent patterns although the sentence accents are very similar. In Växjö the pitch of the accented syllable is rising to a high whereas in Stockholm it is falling towards a low (cf. Fig. 2). This is presumably why the two dialects were judged as belonging to different dialect types. It is interesting to compare this with the Edinburgh and Glasgow accents which were described as high and low respectively by Gilian Brown et al. (1980). There may be perceptual justification for describing the Växjö and Stockholm dialects respectively as high and low.

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