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# A pitch accent journey in southern Sweden

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## Abstract

*In this paper the prosodic typology for Swedish dialects is tested against new data collected in the SweDia 2000 project. Pitch accent gestures are studied for some dialects in the south of Sweden as for classification according to prosodic dialect type, internal variation within a prosodic dialect type and transition between dialect types.*

## 1 Introduction

The topic of the present paper is pitch accent gestures of the word accents (accent I/accent II) in Swedish. The goal is to test the prosodic typology for Swedish dialects (Bruce & Gårding 1978) against new data collected within the SweDia 2000 project (Bruce et al. 1999). The present paper is limited to accounting for some dialects in the south of Sweden.

## 2 Background

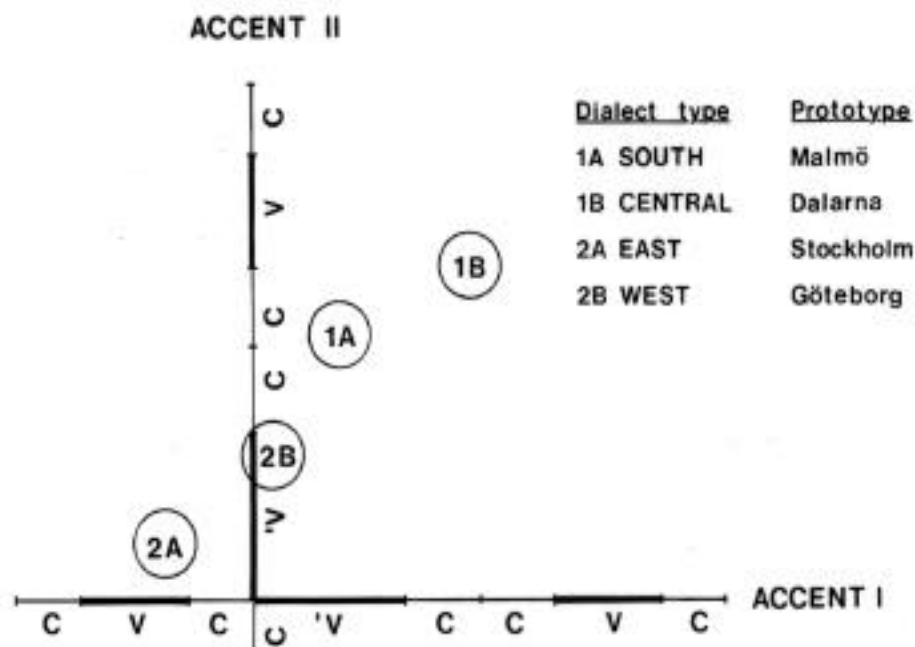
In the prosodic typology for Swedish dialects (Bruce and Gårding 1978) developed in the late seventies within the research project Swedish prosody (cf. Gårding 1982, Gårding et al. 1981), supported by the Swedish Humanistic Research Council, four basic prosodic dialect types of Swedish were distinguished: SOUTH (1A), CENTRAL (1B), EAST (2A), WEST (2B). Prototypes of these dialect types are Malmö, Dalarna, Stockholm and Göteborg respectively. In addition, a fifth prosodic dialect type FAR EAST (0), Finland Swedish (with no word accent distinction), prototype Helsinki, was recognized.

A main feature of this typology was the timing of the pitch accent gesture as critical for the distinction between accent I and accent II. Another critical feature was the pitch realization of focus. Yet another feature, and a third characteristic of the typology was the recognition of the pitch patterns of compounds as a criterion of prosodic dialect type.

In our modelling of intonation (Bruce & Gårding 1978), the distinction between accent I and accent II (in the varieties of Swedish that have the difference) was a difference in the timing of the pitch accent gesture in relation to the segmentals and in particular to the stressed syllable. The pitch accent gesture was modelled in terms of H(igh) and L(ow) turning points. The H+L gesture for accent I appeared to be earlier than for accent II independent of dialect. The timing of the H+L gesture was a relevant parameter not only for the word accent distinction (accent I/accent II) but also for each of the word accents in an inter-dialectal comparison. In this way there appeared to be a distinct order of the four dialect types recognized in the typology from early to late timing: EAST (Stockholm), WEST (Gothenburg), SOUTH (Malmö), CENTRAL (Dalarna).

This is demonstrated in Figure 1, where only the H turning point (the pitch peak) has been modelled as representative of the word accents. In this way a particular order of dialect types in terms of word accent timing is recognized. As can be seen, this order from

early to late timing of the pitch peak in relation to the segmentals is EAST (2A), WEST (2B), SOUTH (1A), CENTRAL (1B).



**Figure 1.** Swedish word accents in an inter-dialectal comparison. Schematic diagram showing the timing of the H turning point in relation to the segmentals for accent I (horizontal axis) and accent II (vertical axis) in the four dialect types (SOUTH, CENTRAL, EAST, WEST).

Generally, there are likely to be restrictions on human capacity of processing pitch accent timing. This seems to be true of both production and perception. Experimentation in different languages clearly demonstrates that we should assume a limited number of pitch accent timings to be exploited in human language (cf. House 1990, Kohler 1987, Pierrehumbert and Steele 1989, D’Imperio & House 1997).

While in our modelling of (non-focal) accentuation (accent I and accent II) there are several distinct timings of a pitch accent gesture available, the pitch realization of focus represents an either-or feature in an inter-dialectal comparison. Focus is either signalled as a separate pitch gesture added after the word accent gesture proper (EAST, WEST), or as a simultaneous pitch gesture, i.e. as a wider range of the word accent gesture (SOUTH, CENTRAL). It should be added that focal accent is typically accompanied by a concomitant lengthening of the constituent under focus.

The identification of the contribution of focus to the pitch contour as either a wider range of the word accent gesture or as an extra pitch gesture added after the pitch gesture of the word accent itself was a confirmation of the traditional division into single-peaked dialect types (SOUTH, CENTRAL) and double-peaked types (EAST, WEST). The categorization into single-peaked and double-peaked refers to the number of pitch peaks in the citation form of an accent II word (cf. Gårding 1977).

### 3 Aim of the present study

The present study is exploratory in nature. Our aim is to give a preliminary answer to the following questions.

- How are the investigated dialects to be classified in terms of the prosodic dialect types recognized in our prosodic typology?
- What is the internal variation within each prosodic dialect type, related to both timing of pitch accent gestures and pitch realization of focus?
- How is the transition from the SOUTH (1A) prosodic dialect type into the neighbouring dialect types, which are likely to be WEST (2B) and EAST (2A)?

### 4 Speech material

In our examination of Swedish prosody we are beginning to exploit the recently collected speech database within the SweDia 2000 research project. Phonetics and phonology of Swedish dialects around the year 2000, which is the official name of the project, is a cooperation between the phonetics sections of the departments of linguistics in Lund, Stockholm and Umeå. The project is planned for a period of six years (1998-2003) and is supported by the Bank of Sweden Cultural Foundation. More than 100 Swedish dialects have been recorded with 12 speakers per dialect representing both a younger and an older generation as well as both men and women. The speech database contains an elicited word list, an elicited prosodic material and a spontaneous interview for each of the recorded speakers.

The elicited prosodic material consists of two-word phrases containing an amount (10, 100) and a currency (\$, Kr, £), e.g. *100 \$* or *10 Kr*. The variables in these phrases are word accent (accent I / accent II) and focus location. In the present study only the phrase final word (focal version) is examined. This word is either an accent I word (*dollar*) or an accent II word (*kronor*).

The study is confined to 17 dialects in southern Sweden. The speakers are elderly men (2-3 speakers per dialect) giving 2-6 repetitions of each elicited item.

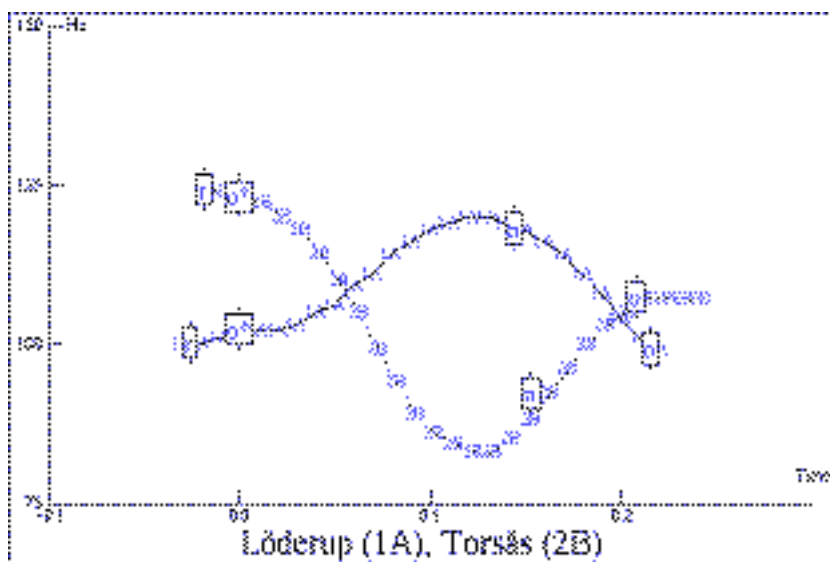
### 5 Pitch analysis

The speech material has been processed using the recent Pitchmatcher developed by Johan Frid. Pitchmatcher is a speech analysis tool for handling pitch contours. By means of label files it is possible to synchronize pitch curves with reference to linguistic or acoustic events, for example the CV-boundary of a stressed syllable.

### 6 Results

The results are to be taken as preliminary. Starting our pitch accent journey from the very south of Sweden, we find that the five places examined in the province of Skåne all belong to the SOUTH (1A) prosodic type. One place geographically adjacent in the province of Halland also belongs to the SOUTH (1A) type. The internal variation within this prosodic dialect type is relatively small. Another place geographically adjacent to Skåne in the province of Blekinge represents a borderline case in terms of the criteria of our prosodic typology. Travelling further into the provinces of Halland and Blekinge and into the province of Småland takes us into the next prosodic dialect type, namely WEST (2B). In these dialects the timing of pitch accent gestures is a bit earlier, and also the pitch realization of focus is different, two-peaked as opposed to one-peaked in the SOUTH. Also within this other prosodic dialect type the internal variation appears to be limited.

In Figure 2 are shown typical examples of pitch contours of the focal accent II word *kronor* in phrase final position from the two dialect types. One example representing the one-peaked dialect type (1A) comes from Löderup outside the city of Ystad (Skåne), and the other example representing the two-peaked type (2B) is taken from Torsås outside the city of Kalmar (Småland).



**Figure 2.** Focal accent II in phrase final position. Typical pitch contours of the word *kronor* produced by two elderly men from Löderup (1A) and Torsås (2B) respectively. The line-up point is the CV-boundary of the stressed syllable.

### Acknowledgments

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