

## WORD PROSODY AND SENTENCE PROSODY IN SWEDISH

Gösta Bruce, Phonetics Department, Lund University, Sweden

Introduction

The present paper summarizes the research on Swedish prosody reported in Bruce (1977) and Bruce and Gårding (1978), and also presents some new ideas concerning intonation in Swedish. The main topic is the relation between word accent, sentence accent and sentence intonation as signalled by  $F_0$ . Our results suggest that observed  $F_0$ -contours typical of statements in four prosodically distinct dialect types (see e.g. Gårding 1975) represent the combined result of one common sentence intonation command, similar word accent commands with different timings, and different sentence accent commands.

Sentence accent

In a prosodic typology for Swedish dialects combining word and sentence prosody (Bruce and Gårding 1978) we have shown how four prosodic dialect types (south, central, east and west) can be characterized mainly by differences in sentence accent. This is illustrated in Figure 1, which shows  $F_0$ -contours of the sentence Man vill lämna våra långa nummer (They want to leave some Långa-numbers), where the placement of sentence accent has been varied. The two accented syllables (accent II) in the sentence - belonging to the verb and the nominal compound respectively - and the secondary-stress syllable in the compound are all surrounded by unstressed syllables. We regard this form of the sentence as optimal for revealing prosodic dialect differences, since the tonal commands can be developed freely with no obvious interference from adjacent commands.

In the south and central dialects, the sentence accent command appears to be superimposed on the word accent command (see Figure 1). Sentence accent is signalled by a wider  $F_0$ -range for the word accent in focus than for the non-focal word accent. For south this wider range is obtained in final position by raising the actual word accent peak, and in non-final position also by lowering the subsequent valley. For central, the wider  $F_0$ -range is achieved mainly by raising the word accent peak in focus both in final and non-final position.

For east and west the sentence accent command comes after

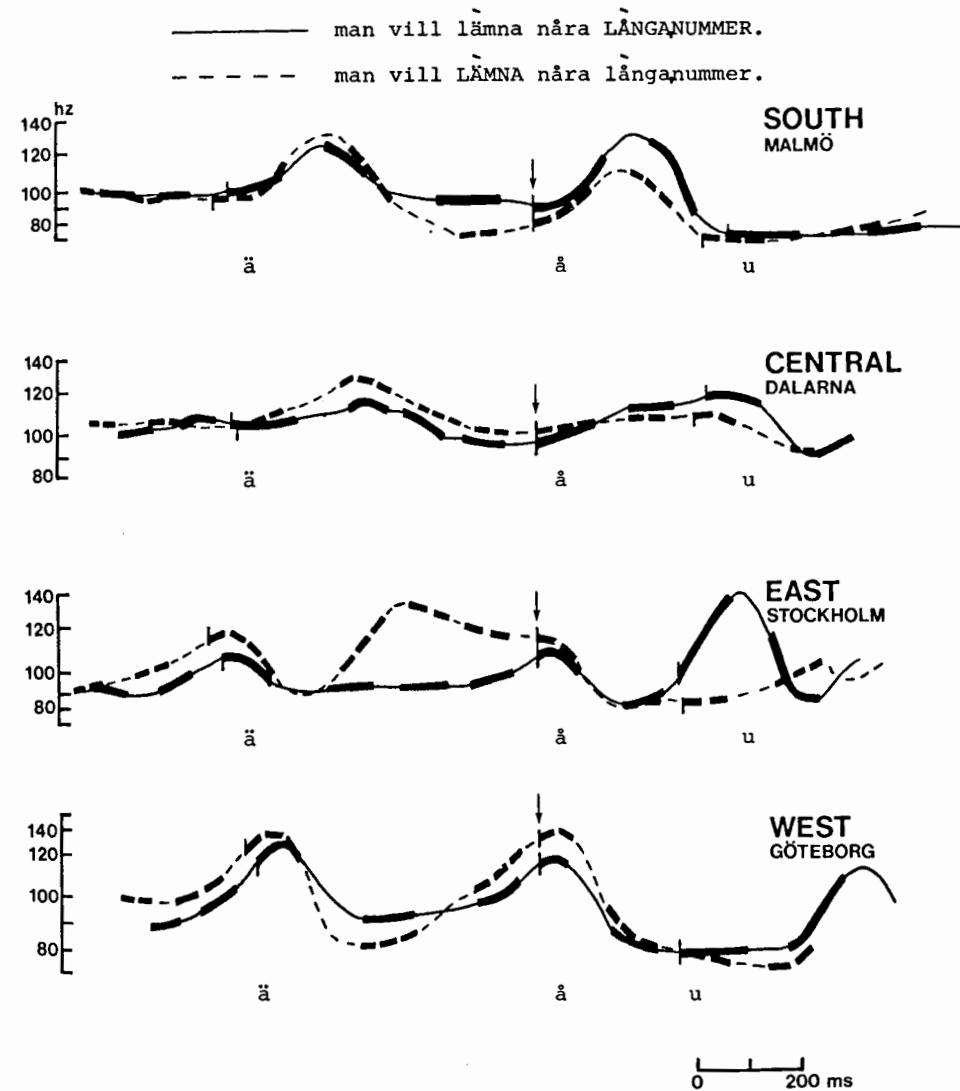


Figure 1. The effect of the placement of sentence accent.  $F_0$ -contours of a sentence with two accented words (accent II). The line-up point (arrow) is at the CV-boundary of the second stressed syllable. Vertical bars indicate the CV-boundaries of the stressed syllables. Vowel segments are drawn in thick lines and consonant segments in thin lines. Focus is indicated by capital letters and non-focus position by small letters.

the word accent command. For east, this means the addition of a separate sentence accent peak immediately after the word accent in focus. For a compound, however, the second peak is postponed until the secondary-stress syllable. The Fo-peak may become a plateau, since in final position Fo will stay on a high level until the utterance-final syllable and in non-final position until the following accented syllable.

For west, the addition of a sentence accent peak in final position occurs in the utterance-final syllable independently of the prosodic structure of the word in focus. In non-final position sentence accent is signalled by both lowering the valley after the word accent in focus and raising the peak of the post-focal word accent, i.e. by a wider Fo-range after the word accent in focus.

This means, in summary, that sentence accent is characterized by a wide Fo-range in all dialect types. In south and central this wide range cooccurs with the word accent in focus, while in east and west it occurs with a time lag.

#### Word accent

When the contribution of sentence accent to the Fo-contour has been isolated, the word accents appear more clearly. Figure 2 shows Fo-contours of the two word accents (accent I and accent II)

in a non-focal position. It appears that for each dialect type the word accent distinction is signalled mainly by the different timing of the word accent peak relative to the stressed syllable (cf. Haugen 1949). The relative timing difference with accent I always preceding accent II is common to all dialects, but the absolute timing of the word accent peaks varies with dialect. The order of timing between dialects from the earliest to the latest absolute timing of the word accent peaks is east, west, south and central (see Figure 2). For east, at the one extreme, the accent I-peak appears as early as in the pre-stress syllable, while for central, at the other extreme, it occurs in the final part of the stressed syllable. The accent II-peak occurs for east in the initial part of the stressed syllable and for central in the post-stress syllable. The timing of the word accent peaks for west and south falls in between these two extremes.

#### Sentence intonation

While the dialect-specific features of Swedish intonation

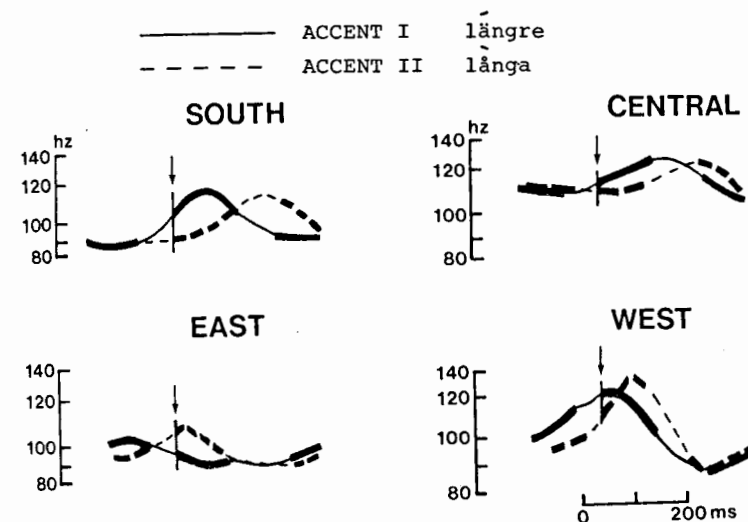


Figure 2. The word accent distinction in non-focal position. Fo-contours of accent I and accent II before focus. The line-up point is at the CV-boundary of the stressed syllable.

are mainly found in the Fo-correlates of word accent and sentence accent, certain aspects of sentence intonation seem to be independent of dialect. Here only statement intonation will be treated. But it appears that also the main features of question intonation are more or less dialect-independent (see Gårding forthcoming).

A characteristic feature of sentence intonation in many languages of the world is the downdrift of Fo over the course of an utterance, also referred to as the declination effect (see e.g. Cohen and 't Hart 1967). This means, in general, that Fo is higher in the beginning than at the end of an utterance with each Fo-peak and Fo valley being lower than the preceding one. In Swedish the topline connecting successive peaks of an utterance appears to decrease at a faster rate than the baseline connecting successive valleys, which means that the Fo-range is also gradually decreasing. This Fo-downdrift is found in English and Danish, too (see Breckenridge 1978, Thorsen 1978).

A model was proposed in Bruce and Gårding (1978) to account for the main features of sentence intonation in Swedish. In my experience it is not typical of the Fo-downdrift in Swedish to be

evenly distributed over an utterance. The total Fo-drop in an utterance for a given speaker appears to be the same, however, regardless of the length of the utterance. The actual course of the Fo-downdrift in an utterance seems to be dependent on several factors, such as the location of sentence accent and of the word accents. Figure 3 illustrates this point. It shows Fo-contours of the sentence *Man vill lämna våra långa nunnor* (They want to leave some tall nuns) containing three accented syllables (accent II) with varying placement of sentence-accent.

The Fo-drop appears to have a stepwise and not gradually decreasing course. The downstep takes place in connection with the accented syllable. In unaccented syllables before and after a word accent there is no systematic downward slope.

It will be assumed that the basic sentence intonation command (statement intonation) has a stepwise decreasing course with a successive narrowing of the range. Sentence accent normally interferes with sentence intonation, introducing a break into the basic pattern (see Figures 1 and 3). This may affect the course of the topline as well as that of the baseline depending on the dialect. Before focus the Fo-drop and the narrowing of the Fo-range of the word accents appear to be relatively gentle. After focus, however, it usually decreases more rapidly, with a considerable narrowing of the Fo-range.

As a consequence of the Fo-downdrift there is a position-dependent variation of word accent and sentence accent. A word-accent in the beginning of an utterance has higher Fo-values for peak, valley, and range than at the end (everything else being equal). Also the corresponding sentence accent values tend to decrease with position in the sentence.

#### Conclusion

Sentence intonation (statement intonation) in Swedish can be represented independently of dialect by a stepwise decrease of Fo taking place in connection with the word accents and affecting peak, valley, and range values. This downdrift pattern will often be locally disturbed by sentence accent introducing a break into the basic Fo-course in a dialect-specific way. This suggests that the downdrift is linguistically controlled rather than a consequence of some peripheral production constraint. Instead it can be assumed to be built into the intonation system.

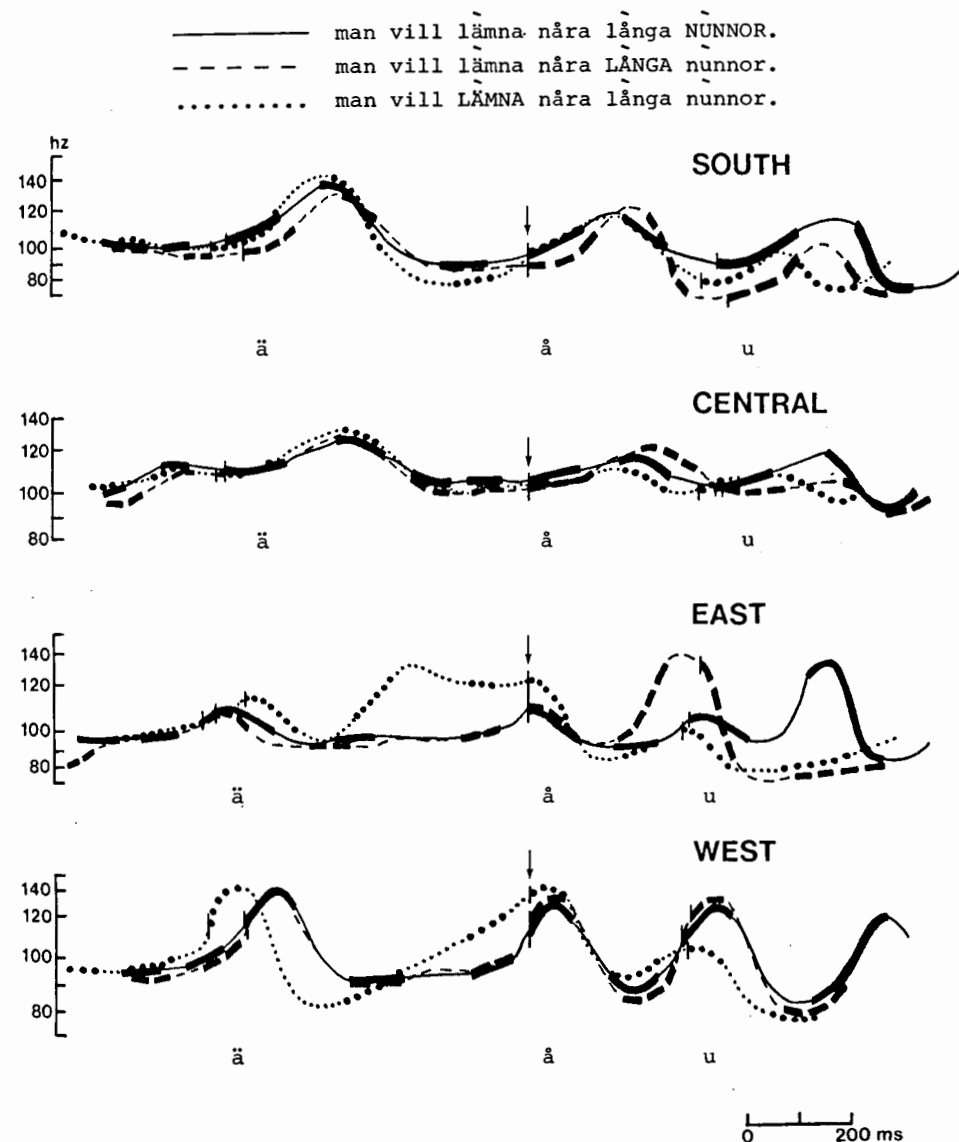


Figure 3. Downdrift in Swedish - the combined effect of statement intonation and the location of sentence accent and word accent. Fo-contours of a sentence with three accented words (accent II). The line-up point is at the CV-boundary of the second stressed syllable.

Acknowledgements

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