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# Nordic Prosody IV

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## HOW FLOATING IS FOCAL ACCENT?

### Topic

The topic of my paper is the focal accent (= phrase accent, sentence accent) of Standard Swedish. Focal accent represents the highest level of prominence at the utterance level. Although lengthening may also be involved in the phonetic realization of focal accent (Bannert 1979, Bruce 1981), I will restrict myself here to discussing pitch prominence. Focal accent is intimately tied to word accent. The two contrastive word accents - accent I and accent II - of Swedish (Bruce 1977) and Norwegian (Fretheim 1978, 1984) thus have focal and non-focal variants. Based on my analysis of the Swedish word accents in my thesis (Bruce 1977, ch. 8) and elaborated with the notation of autosegmental phonology (e.g. Goldsmith 1976) I assume the following tonal representation:

	accent I	-	H L*
non-focal <	accent II	-	H* L
	accent I	-	H L* H
focal <	accent II	-	H* L H

The two word accents are analyzed as having the same tonal set-up with the word accent distinction being expressed as a difference in which tone (starred) is being associated with the stressed syllable. Focal accent is the H tone following the word accent H L. Phonetically this means that focal accent (=sentence accent) is realized as a pitch rise following the pitch fall for word accent I or II and preceding the terminal fall of an utterance final position as illustrated in Figure 1.

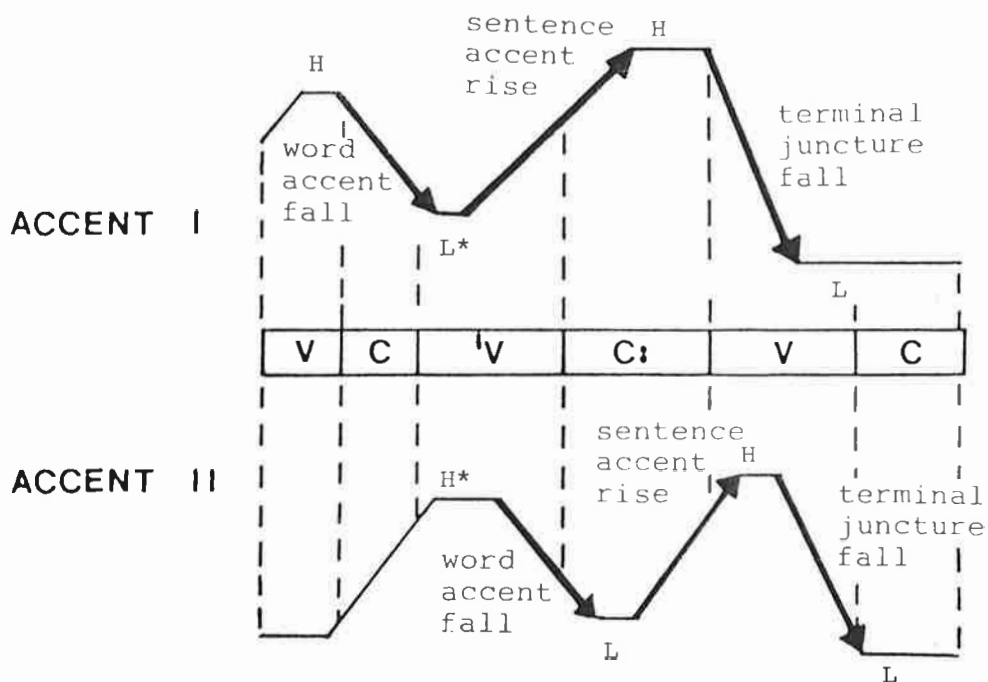


Figure 1. The pitch contributions of word accent, sentence accent (focal accent), and terminal juncture. Stylized contours of one accent I and one accent II word (after Bruce 1977).

### Problem

The problem to be discussed here involves the timing characteristics of the pitch rise from word accent L to focal accent H and its variation depending on factors such as final / non-final position, number of syllables in the actual stress group and the choice of word accent (I or II) of a following stress group. The exact nature of the timing of the focal accent rise is still very much an open question.

### Traditional Analysis

The starting point for the discussion is my own treatment of Swedish accentuation in my thesis (Bruce 1977, ch. 8), which is not unlike autosegmental accounts of comparable phenomena (cf. Goldsmith 1976). I will restrict myself here to discussing word accent II, which appears to be the most interesting case.

A basic assumption of this description (as well as in autosegmental analyses) is that the syllable is the tone bearer. All phonetic data point to the High turning point of accent II (H\*) as temporally very stable and located at the beginning of the stressed syllable. The following Low (L) and especially the High (H) turning points appear, however, to be more variable as to their syllable / segment location. Although, according to this traditional analysis, the tone bearer is not the same syllable in all contexts, there is always a particular syllable associated with the H (and also the preceding L) tone.

The traditional analysis takes the least crowded environment as the starting point. This environment is one where each pitch gesture - word accent fall (H\* L), focal accent rise (L H) - is minimally influenced by other pitch gestures. Due to the normal interaction of pitch gestures in more crowded environments context dependent adjustments will take place expressed in this framework as reassociations (anticipations) of tones to other (preceding) syllables. For example for a disyllabic accent II focussed word, a non-final (less crowded) position with several unstressed syllables up to the next stress is considered basic, while the same word in a final position (crowded) is considered to show an adjusted tone / syllable association.

	<u>non-final basic</u>	<u>final adjusted</u>
focal	H* L H H L*	H* L H L
accent II		\ / \ /
	s* s s s s*	s* s
	"fly: -ga-me-non-'man:	"fly: - ga

This means that in non-final position, as exemplified above, the word accent L is associated with the post-stress syllable and the focal accent H with the 2nd after the stressed syllable, while in final position the L will be reassociated with the stressed syllable and the H with the post-stress syllable because of the interaction of pitch gestures.

### Alternative analysis

An alternative analysis of the timing of Swedish accentuation is proposed in Bruce (1983a). Similar analyses are given for Danish by Thorsen (1978), for Norwegian by Fretheim (1978, 1984) and for English by Hirst (1983). In this kind of analysis the stress group (- foot) and not individual syllables is taken as the domain for accentuation (tone bearer). According to this view, apart from the highly critical synchronization demand of word accent H\* at the stress group boundary, there is no timing demand for the following word accent L or focal accent H with reference to particular syllables or segments within the actual stress group. Thus there is assumed to be a floating relationship, i.e. no fixed link between tones and syllables. The alternative analysis is illustrated below for the same examples as in the traditional analysis. (F - foot, stress group)

	<u>non-final</u>	<u>final</u>
focal	H* L H H L*	H* L H L
accent II	\ \ / / /	\ \ / /
	F F	F
	/ \ \ \ \	/ \
	s* s s s s*	s* s
	"fly: -ga-me-non-'man:	"fly: - ga

In contrast to the traditional view, it should be noted that there is no need to assume that the least crowded environment is basic. Instead, in the alternative analysis we may as well take the most crowded environment - in the exemplification here a disyllabic accent II word in utterance final position - as our starting point setting the reference for other contexts.

### Experiment

In order to elucidate in some detail the problem presented above with new phonetic data, special test material was designed. In the choice of test words microprosodic variation has been avoided. The test sentences shown below were elicited as answers to appropriate questions. In the test material focal accent (II) was elicited on the main verb, and the main variables were number of syllables in the stress group and choice of word accent in the following, non-focal stress group. The number of inter-stress syllables was varied from 1 - 4, where for 1 - 3 syllables both word accents occur in the following stress group.

### TEST MATERIAL

han vill	"FLYGA.	he wants to	FLY.
"	'me.	"	too.
"	"mellan.	"	between.
"	me nån.	"	with someone.
"	me "Nånne.	"	with Nånne.
"	me nån 'man.	"	with some man.
"	me nån "mamma.	"	with some mum.
"	me nån ma'dam.	"	with some madam.

A male Stockholm speaker (50 y) recorded the speech material six (seven) times.

### Results

Fo tracings of the 6 - 7 repetitions are given separately for each test sentence in Figures 2 - 3, where consonant portions are represented as gaps. The results here will be given in qualitative terms.

Looking upon the data from the point of view of the timing of Fo turning points relative to segmental references we find the following picture. The constancy of the time location of the word accent H\* at the beginning of the stressed vowel /y:/ is apparent. The relative location of the word accent L shows only slight variation. For the first (final) and second (shortest non-final) test sentences it is located at the /y:/ - /g/ boundary, while for longer non-final contexts it occurs slightly later at the /g/ - /a/ boundary. The location of focal accent H is relatively early in the /a/-vowel for final position, at the very end of /a/ for the shortest non-final context, while in all other contexts it occurs in the following /e/-vowel. With successively more syllables added within the stress group the focal accent H will turn into an Fo plateau before the pitch drop for the following word accent (cf.

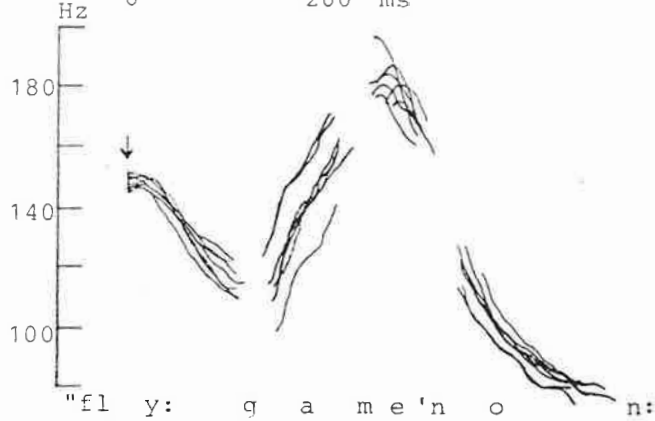
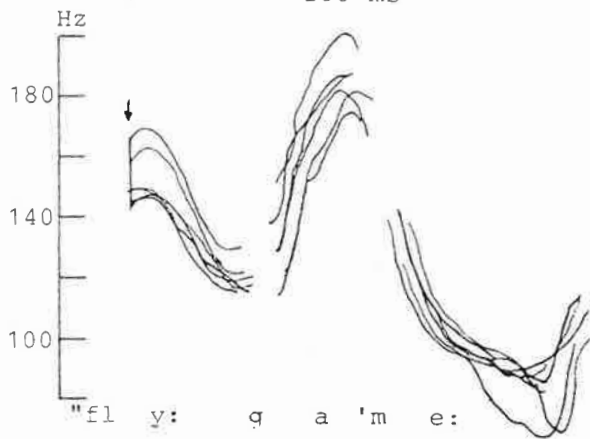
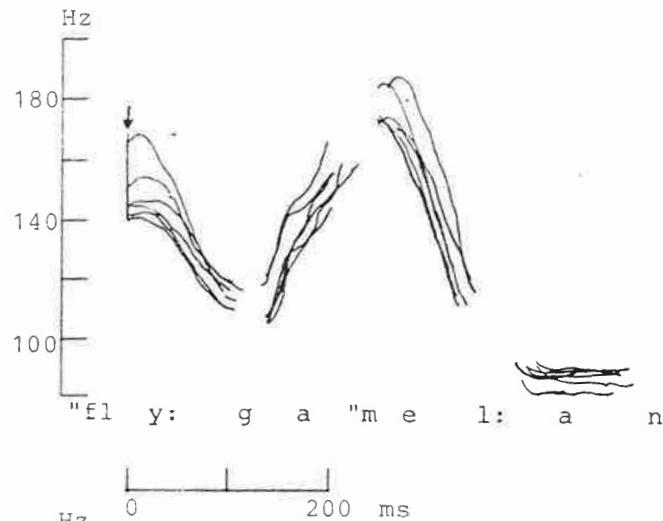
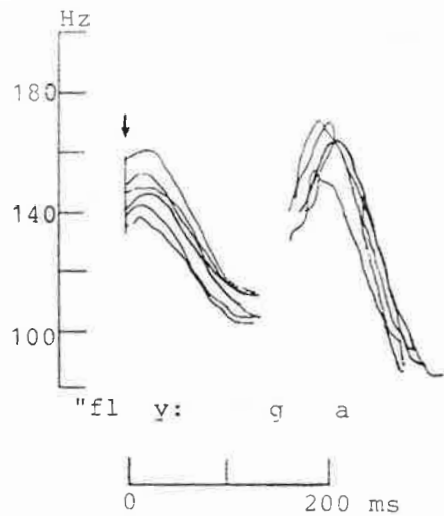


Figure 2. Timing of F<sub>0</sub> and segmental references. F<sub>0</sub> tracings of the 6 -7 repetitions of the first half of the test material. Consonant portions are represented as gaps.

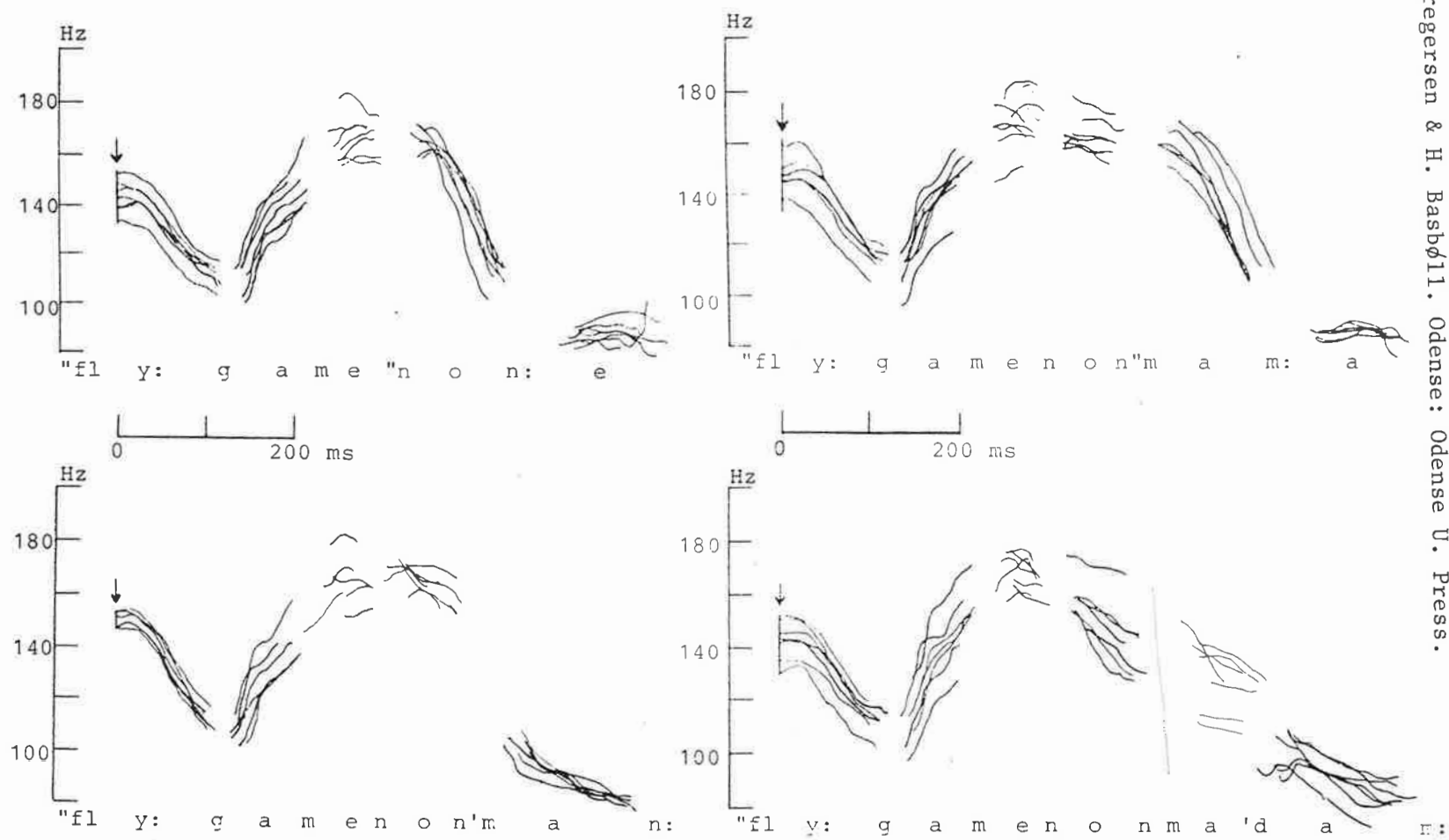


Figure 3. Timing of F<sub>0</sub> and segmental references. F<sub>0</sub> tracings of the 6 - 7 repetitions of the second half of the test material. Consonant portions are represented as gaps.



Bruce 1977, ch.5); an exception is the extreme case with four inter-stress syllables having instead a downdrift up to the final stress.

Switching the perspective and looking instead at the location of the segments /y:/, /g/, /a/, on the Fo contour depending on the context we observe the following regularities. The location of /y:/ is constant covering the word accent fall. For /g/ there is some variation so that in final position it is climbing the first major part of the focal accent rise, while in non-final positions it occurs by and large in the valley between the fall and the rise. The location of /a/ shows more variation. In final position it occurs on the last minor part of the rise and on all of the immediately succeeding terminal fall. In the shortest non-final position /a/ covers almost all of the rise including the Fo maximum, while in other, non-final positions it is located on the first major part of the focal accent rise.

In Figure 4 are illustrated the time course characteristics of the focal accent rise relative to the stress group boundary without segmental references (two examples) for all but the longest test sentence.

In spite of the variation in the location of Fo turning points relative to segmental references depending on context as described above, we find here the following interesting pattern. The fall-rise of focal accent II has an almost invariant time course. The word accent H\* and L turning points show almost no variation for the different test sentences, while there appears to be some variation in the timing of the focal accent H turning point (relative to the stress group boundary): a tendency towards later timing with more syllables in the stress group or accent II in the following stress group.

The earlier timing of the focal accent H can for some cases - final and shorter non-final contexts - be interpreted as resulting from the interruption of the focal accent rise by the immediately succeeding (terminal or word accent) fall, also with a consequent undershooting of the target Fo maximum (cf Bruce 1977, ch. 5). For other cases there seems to be a more genuine later timing of the focal accent H due to a more gentle gradient of the rise in its later part. But the general impression is still one of amazing constancy in the time course of the whole fall-rise typical of focal accent II, when segmental references have been disregarded.

### Interpretation

Although the Fo data are not incompatible with the traditional analysis with its tone - syllable associations, the invariance of the time course of the fall-rise for all contexts, when segmental references are disregarded, is not predicted by this analysis.

Instead this time constancy of the fall-rise for focal accent II (independent of the length of the stress group or word accent of the following stress group) rather points to the correctness of the alternative analysis with a floating relationship

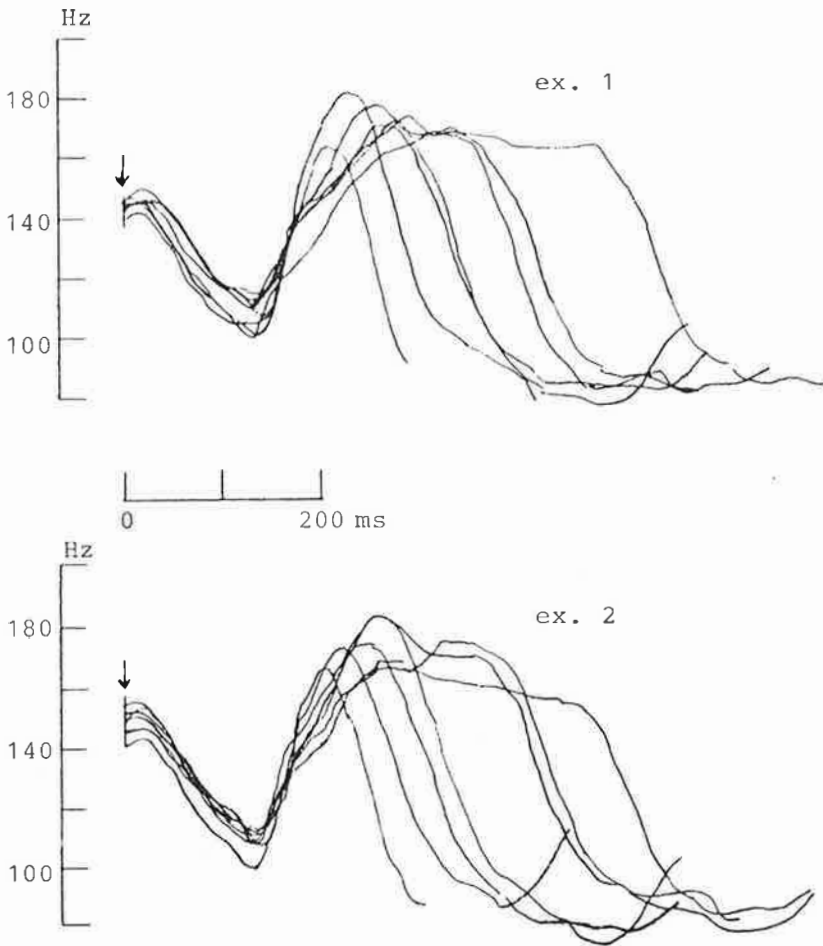


Figure 4. Timing of F<sub>0</sub> without segmental references. Comparison of F<sub>0</sub> tracings in all but the longest test sentence (*flyga* in different environments). Two examples.

between tones and syllables, except for the highly critical synchronization at the stress group boundary. Consequently the variation in the location of segments relative to the F<sub>0</sub> contour described above cannot be due to variation in the time course of the fall-rise but are rather mainly due to temporal adjustments of the segments, for example pre-pausal lengthening. It is also reasonable that in a language like Swedish with its strong distinction between stressed and unstressed syllables (cf. Bruce 1983b) it is only stressed syllables or rhythmical group boundaries of, for example stress groups that are important coordination points for pitch gestures, while non-prominent, individual syllables like the unstressed ones are not.

### Summary

In the present paper the timing characteristics of the focal accent rise in Standard Swedish have been discussed. The starting point was a description of two different analyses of the relationship between tones and syllables for focal accent II (H<sup>+</sup> L H). The traditional analysis assumes a specific tone - syllable connection for all

contexts, but which syllable is the tone-bearer (of the L or the H) may vary with context. The alternative analysis assumes a floating relationship between tones (L and H) of the focal accent rise and syllables with only a critical synchronization for the word accent H\* at the stress group boundary. Although the phonetic data do not appear to be incompatible with the traditional analysis, the timing characteristics of the rise rather support the alternative analysis. The high constancy in the timing of the focal accent rise for different contexts with segments disregarded is not predicted by a tight tone - syllable alignment but suggests a floating relationship.

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