

An 'early fall' in Swedish intonation: utterance or word prosody?

Evidence from a comparison with German.



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Background 1: German pitch accents (Kohler 1987; 2005)

form

EARLY PEAK
MEDIAL and LATE PEAKS

function

'given/ established information'
'new information'

phonetics

EARLY = pitch is falling from pre-stress to stressed syllable
MED/LATE = pitch is high or rising in stressed syllable

AM representation

(Grice et al. 2005)

EARLY PEAK $H+L^*$, $H+!H^*$
MEDIAL and LATE PEAKS $(L+)H^*$, L^*+H

Examples

spectrogram and f0

Eliciting EARLY and non-EARLY

is possible, e.g., by letting subjects act out a dialogue such as:

A: Wann machen wir eigentlich diese Reise?

B: Gute Frage. Wie wär's im **November**. → **non-EARLY**

A: Ja, das ist wahrscheinlich eine gute Idee. Da ist das Wetter bestimmt schön, und außerdem passt das ja zeitlich ganz gut.

B: Genau. Dann sagen wir also erstmal irgendwann im

November. → **EARLY**

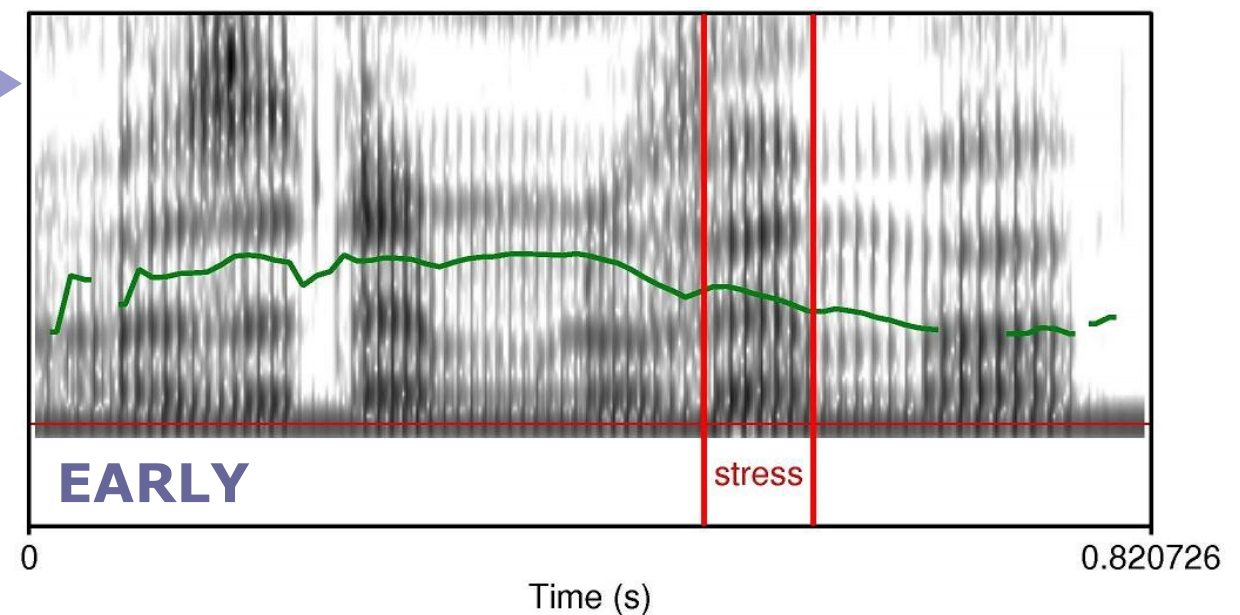
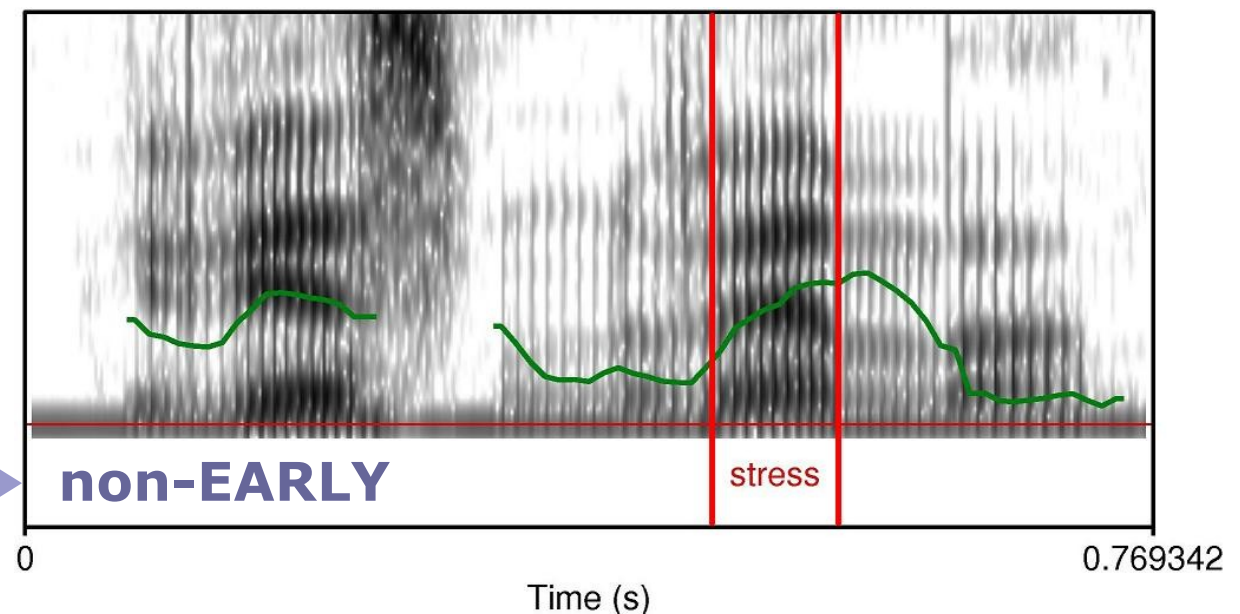
English translation:

A: When are we going on this trip?

B: Good question. How about some time in **november**?

A: Yes, that's probably a good idea. The weather should be nice then, and it would fit well with our time table.

B: Right. Let's say some time in **november**, then.



Background 2: Swedish lexical pitch accents (Bruce 1977; 2005)

form

EARLY FALL
LATE FALL

function

word accent I
word accent II

This relation of relative timing holds for all dialects, but the absolute timing varies largely from dialect to dialect. Here, only the Stockholm dialect is considered:

phonetics

EARLY = pitch is falling from pre-stress to stressed syllable
LATE = pitch is high at stressed-vowel onset and then falling

Focal and non-focal variants

(Bruce 1977; 2005)

- Focus is marked prosodically by a **focal accent**: a pitch rise that takes place after the lexical pitch fall.
- That is, there are focal and non-focal variants of the word accents, the focal variants being rather complex.

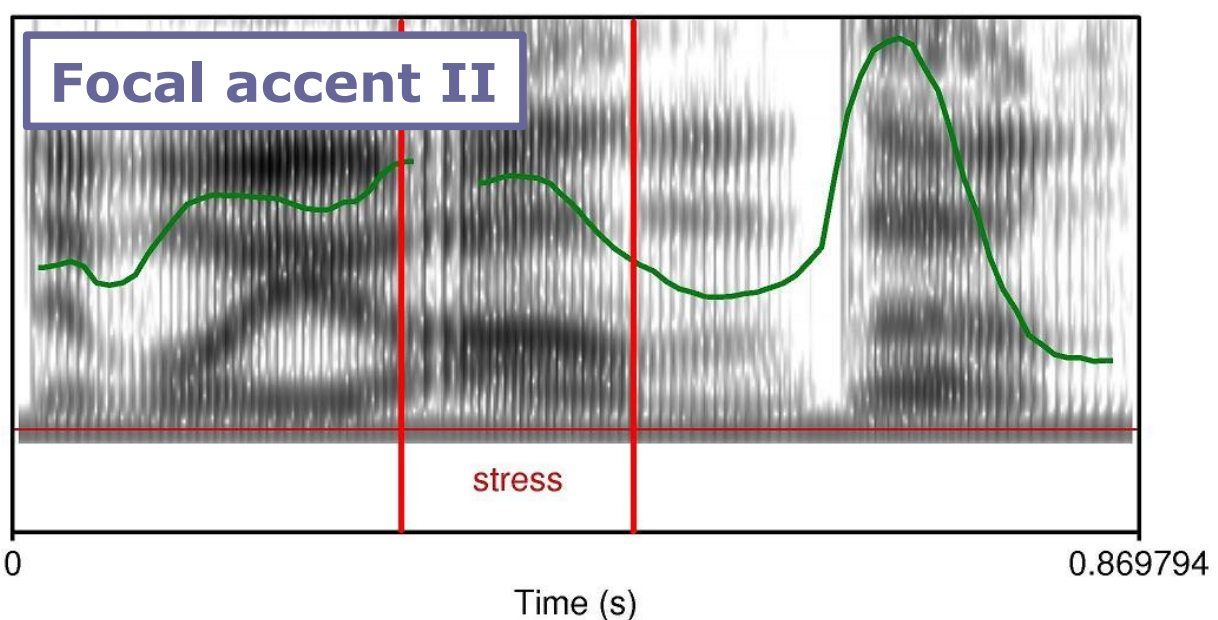
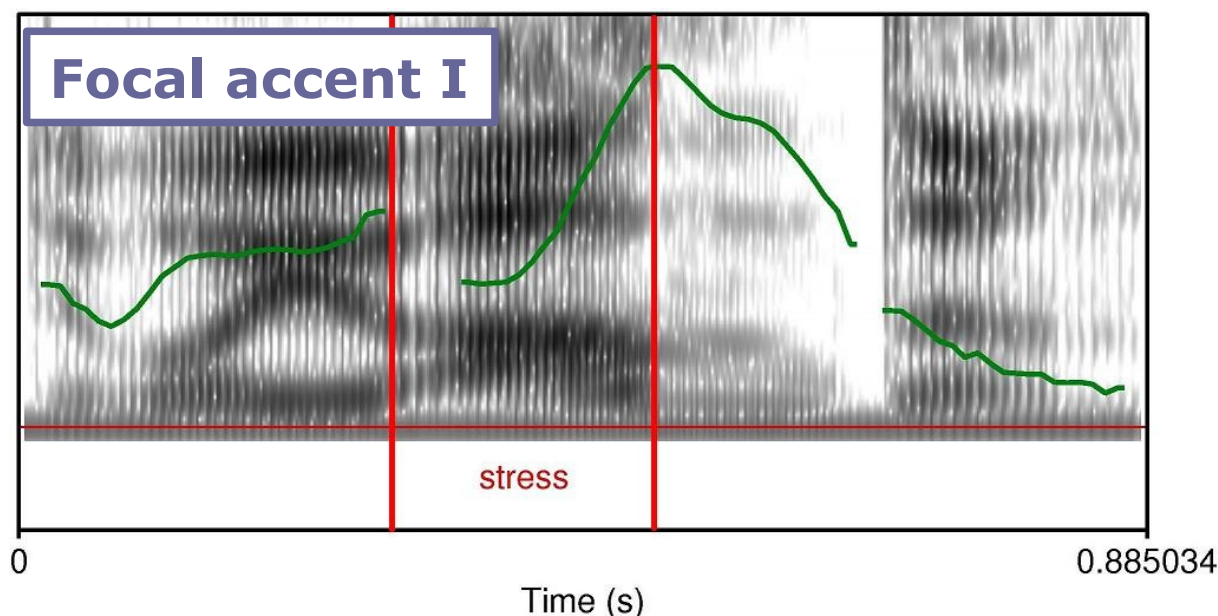
Examples (focal accents)
spectrogram and f0



"Det var ju anden." (*It was the duck/spirit.*)

AM representation (Bruce 2005)

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



Research question

(originally formulated in Ambrazaitis 2006)

Pitch pattern timing

is utilised in Swedish and German, but on different levels: on the **word level in Swedish** and on the **utterance level in German**:

Swedish

EARLY: word accent I
LATE: word accent II

German

EARLY: given information
MED/LATE: new information



Is there a Swedish correlate for the German EARLY/LATE contrast?

Is it simply a question of +/- focal accent?

Method

Simulated Dialogues

So far, only test recordings have been undertaken:

- 4 speakers of Stockholm Swedish
- 6 test dialogues for "confirmation" with different testwords (3 accent I words, 3 accent II words)
- (Some test dialogues for "new")

Example dialogues:

A: Hur skulle vi egentligen åka till Köpenhamn i morgon?
Det var väl med bilen/färjan, eller?

Confirmation condition:

B: Ja, det var med bilen/färjan.

New information condition:

B: Nej, vi skulle ta färjan/bilen.

English translation:

A: How are we getting to Copenhagen tomorrow? We were gonna go by car/ferry, didn't we?

B: Yes, by car/ferry. (*confirmation*)

B: No, we were gonna go by ferry/car. (*new information*)

Preliminary analysis

Auditory/ acoustic classification of the accent/ the accentual fall (by Gösta Bruce and myself):

+/- focal accent

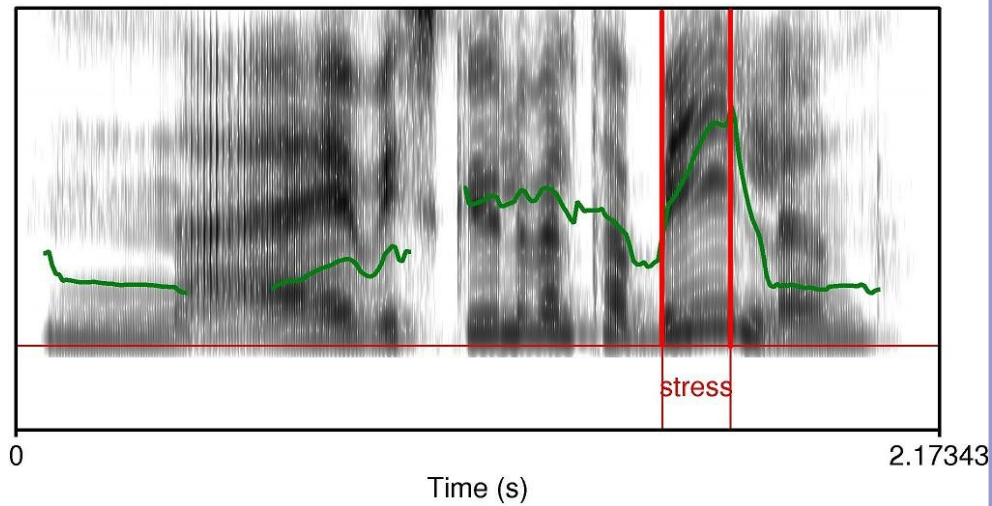
+/- EARLY pitch timing (+EARLY = pre-stress is high and stressed syllable is already (relatively) low from the beginning; if pitch is falling from a high level during the stressed vowel, this counts as -EARLY!)

Preliminary results (examples)

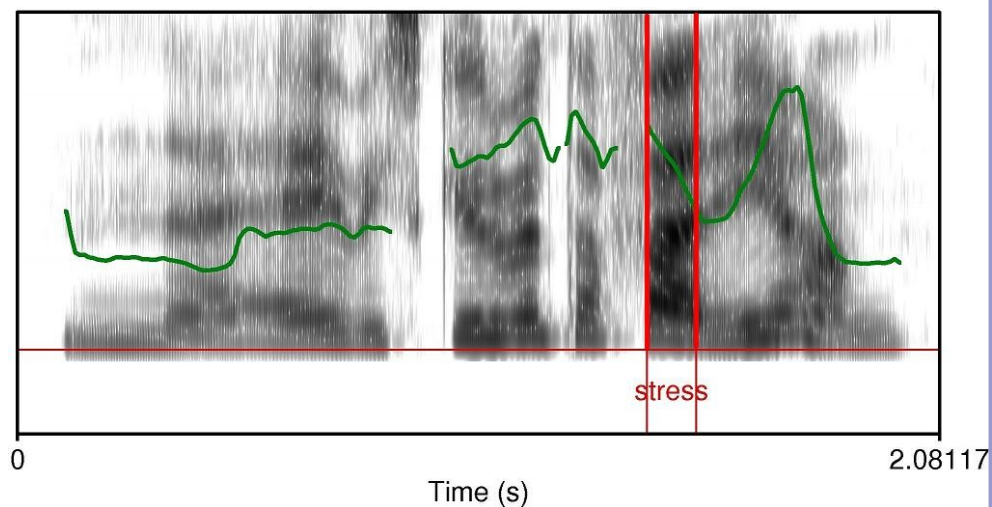
new information

"Nej, vi skulle ta bilen/färjan."
("No, we were gonna go by car/ferry.")

Acc I - "bilen" (the car)



Acc II - "färjan" (the ferry)

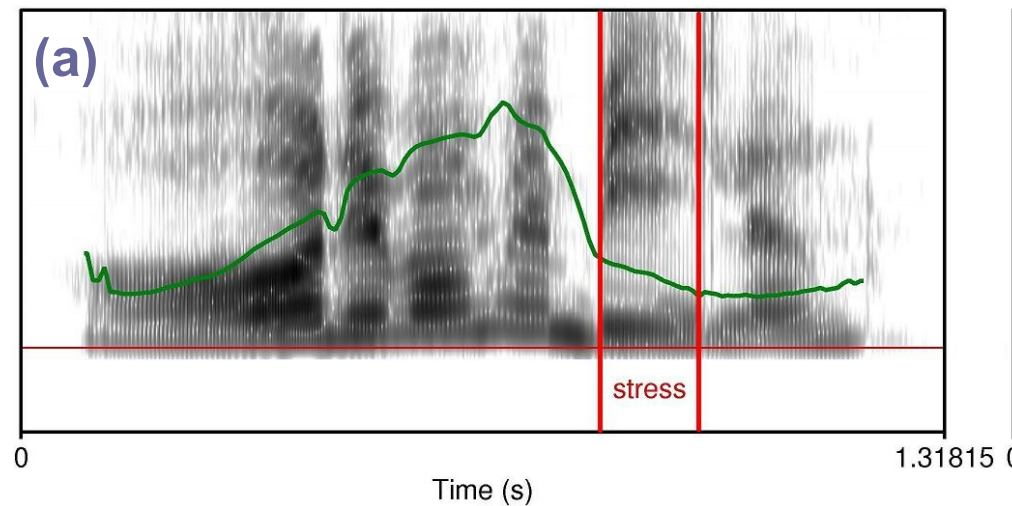


As expected, a focal accent was produced in the new information condition by all four speakers in nearly all contexts.

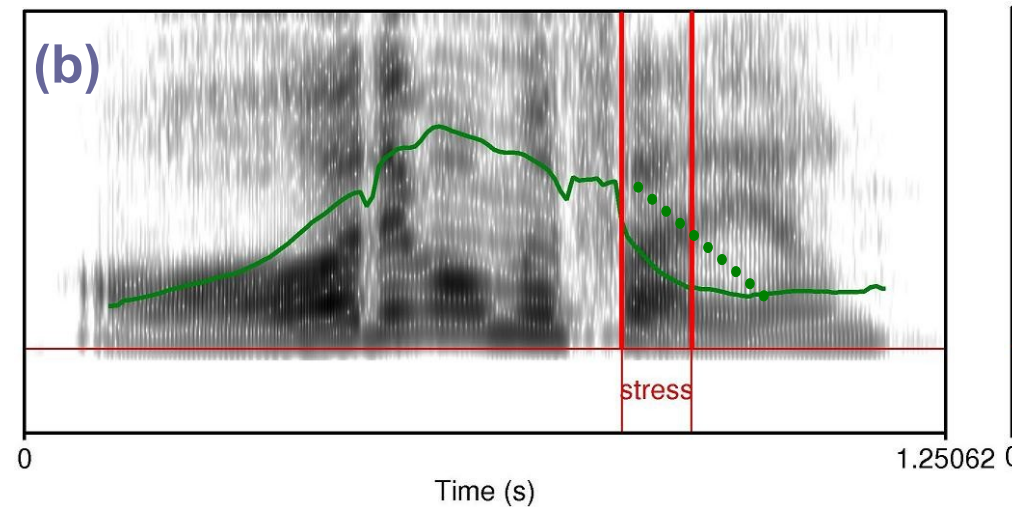
confirmation

"Ja, det var med bilen/färjan."
("Yes, by car/ferry.")

Acc I - "bilen" (the car)



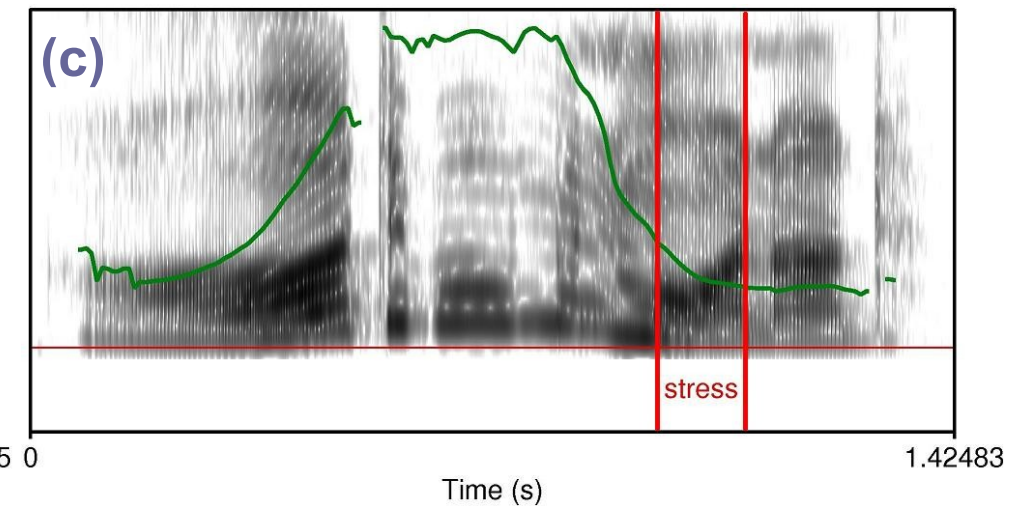
Acc II - "färjan" (the ferry)



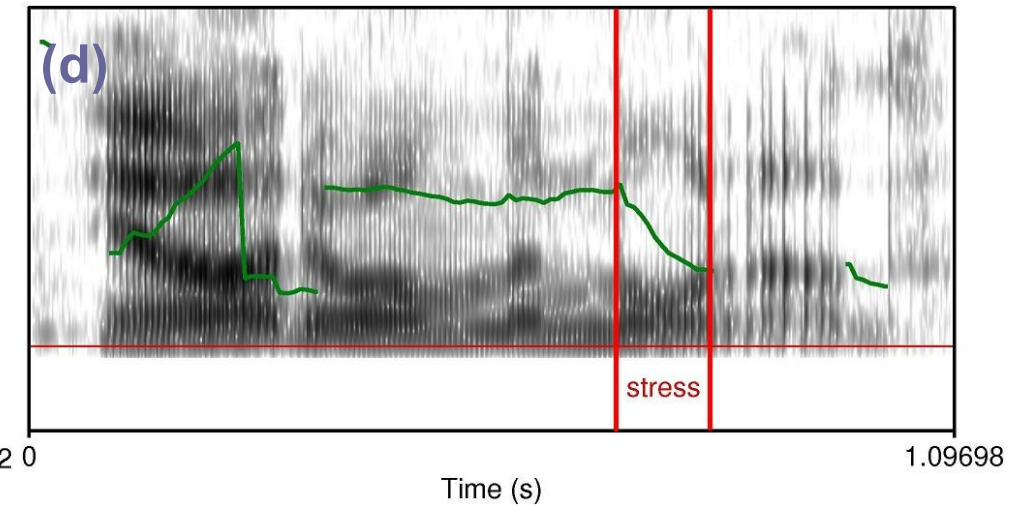
As expected, no focal accent was produced (by three of the four speakers) in the confirmation condition. Unexpectedly, however, accent II was produced with an accent-I-like EARLY fall in some cases (b and c). (a), (b) and (c) were produced by the same female speaker. In (b), it is indicated by a dotted line how a typical accent II fall should have looked like. In (d), a typical accent II fall was realised by a male speaker.

"Ja, det var om en månad."
("Yes, in a month.")

Acc II - "månad" (month)



Acc II - "månad" (month)



Preliminary analysis: confirmation

The results of the auditory/ acoustic classification are shown in the table. It is indicated whether or not a focal accent was produced (+/-FOC). In case no focal accent was produced, it was judged whether the accentual fall was EARLY (i.e., accent-I-like) or late (+/-EARLY).

Recall: EARLY means that the pre-stress syllable is high and the stressed syllable is already (relatively) low from the beginning; if pitch is falling from a high level during the stressed vowel, this counts as -EARLY!

<i>Session</i>	<i>Speaker</i>	<i>"bilen"</i>	<i>"juni"</i>	<i>"november"</i>
1	m-1	+FOC	+FOC	+FOC
	f-1	-FOC -EARLY	-FOC ?EARLY	-FOC +EARLY
2	m-2	-FOC +EARLY	-FOC +EARLY	-FOC +EARLY
	f-2	-FOC +EARLY	-FOC +EARLY	-FOC +EARLY
		<i>"färjan"</i>	<i>"månad"</i>	<i>"väninna"</i>
1	m-1	+FOC	+FOC	+FOC
	f-1	-FOC -EARLY	+FOC	-FOC -EARLY
2	m-2	-FOC -EARLY	-FOC -EARLY	-FOC +EARLY
	f-2	-FOC +EARLY	-FOC +EARLY	-FOC +EARLY

Accent I words

Accent II words

As expected, a non-focal accent was produced for confirmation (exceptions – **marked grey** in the table: all productions by speaker m-1 and one production by f-1).

Cases with an **EARLY fall are marked green**, and cases with a **LATE fall are marked red**.

Surprisingly, the non-focal word accents were not consistently produced with an EARLY (accent I) or a LATE (accent II) tonal gesture, respectively. First of all one speaker (f-2) produced only accent-I-like EARLY patterns, for both word accents. The other speakers produced a somewhat clearer separation, however, not a completely convincing one.

Discussion

- A certain intonational gesture (fall from high to low) was found in connection with a certain communicative function (signalling confirmation) for Swedish.
 - The word accent contrast can be (and in many cases is) signalled by letting the fall for accent II take place later than for accent I. The state-of-the-art analysis would be that the earlier fall is the typical and expected non-focal gesture for accent I (H+L*), and the later fall the typical and expected non-focal gesture for accent II (H*+L).
 - However, in an number of cases, **the word accent contrast was not maintained** – at least not clearly by tonal means: The fall was early even for accent II. Basically the same tonal gesture (early fall) would be expected also for German in a comparable communicative context.
 - **An intuitive explanation** for this similarity is simply that we are confronted with the same form-function relation in the two languages. This would imply that the 'high-low' for 'confirmation' is located at the utterance level in German and in Swedish.
- How would state-of-the-art models for Swedish and German intonation analyse an early fall, if observed in connection with:
 - German: as a phenomenon on utterance level
 - Swedish acc I: as non-focal word accent I
 - Swedish acc II: unanalysable
 - **Different analyses of the same phenomenon?**
 - An alternative analysis is the following:
 - The early fall in connection with confirmation is NOT an active gesture for (non-focal) accent I, but a feature of the utterance.
 - Parallel to this globally falling utterance intonation, the word accent contrast may be encoded by a local adjustment of the timing of the fall. For that, it is sufficient to assume that only for accent II an active gesture is executed (namely a delay of the fall – which in turn is determined by the utterance prosody in this confirmation context).
 - However, this parallel encoding of utterance and word prosody is (to some extent) optional. It is more important to realise appropriate utterance prosody than to maintain the Swedish word accent contrast.

Outlook

- The data presented here are taken from an exploratory study that did not only focus on the question discussed here. Strong conclusions have been drawn on a preliminary and small, i.e. a weak basis. More recordings are in preparation.
- Of course, comparable data for German are needed, too, and will be recorded soon.
- Even in the cases where accent II was produced with an EARLY fall, native speakers still tend to hear the correct word accent. However, this observation has only been made informally with few listeners. Systematic perceptual experiments are needed: How large does the tonal difference in non-focal word accents have to be in order to maintain the distinction? Do other – non-tonal – cues also play a role here?
- Irrespective of the outcome of such perceptual studies, the current study supports and extends the view that only accent II has its own tonal gesture, while accent I may be regarded as unmarked (e.g. Engstrand 1995). However, a number of detailed problems concerning this question still have to be solved.
- A comparable investigation is planned also for the South Swedish dialect of Lund. This is interesting because this dialect differs prosodically from Stockholm Swedish in two important ways:

- ✓ First, focus is not signalled by a separate focal gesture.
- ✓ Second, the absolute timing of the word accents is much later: For both word accents the relevant tonal gestures take place within the accented foot. In production, even the accent I gesture appears to be rather stable. For perception, however, this gesture does not appear to be necessary (Ambrazaitis and Bruce 2006).

References

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