

# Question intonation in Southern Swedish

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## Abstract

*Swedish has been generally assumed not to have any well-defined question intonation. However, with respect to Southern Swedish, Lindblad & Gårding (1973) present data showing final rises in polar (Y/N) questions. Gårding (1979) also assumes a broader and higher F0 range in Y/N questions than in statements, particularly on the final focussed word. The present study investigates the extent to which these question cues occur in a material involving spontaneous dialogues led by a speaker of Southern Swedish (Malmö). Results for utterances with question syntax show final rises in 16% of the Y/N questions and 3% of the Wh-questions. For utterances without question syntax, 79% were associated with final rises. Comparing F0 on the first prosodic word of questions, both Y/N- and Wh-questions showed a significantly higher F0 level (ca. 2-3 ST higher) than statements. A further comparison of the F0 level on the most prominent word following the first prosodic word in questions and statements showed that Y/N questions had a higher F0 on the most prominent word than statements. However, Wh-questions did not differ significantly from statements in that respect. Thus initial F0-level appears to be a strong prosodic cue distinguishing between questions (both Y/N questions and Wh-questions) and statements in the Southern Swedish material examined. F0 level on the most prominent word following the first prosodic word is also a reliable prosodic cue distinguishing Y/N questions from statements and Wh-questions, but not for distinguishing between Y/N questions and Wh-questions.*

## Introduction and background

It has been assumed that Swedish does not have any general prosodic cues to questions. Syntactic cues can distinguish questions from statements, and thus the use of intonational cues such as high boundary tones is not commonly found. Final rises have, however, been seen to occur in some contexts. House (2004, 2005) observed that Wh-questions in Central Swedish sometimes are associated with a final rise. In the material House examined (200 Wh-questions beginning with *vad* ‘what’ and *vem* ‘who’ extracted from human-computer dialogues), 22% of the Wh-questions had a final rise. Rises appeared most often in children's questions (32%), women had somewhat fewer rises (27%), and men, the fewest rises (17%). The rises were also observed to occur mostly on final focused words and were characterized by a delayed focal peak. Gårding &

Lindblad (1973) and Gårding (1979) investigated differences in statement and Y/N question intonation in different Swedish dialects. They compared words uttered as statements and (echo) questions elicited from speakers from four dialect areas: Skåne (Southern Sweden), Stockholm (Central Sweden), Gotland, and Götaland (between Southern and Central Sweden). Results from their study showed that Y/N questions in Southern Swedish exhibited a final rise which resembled that in other Germanic languages (Gårding 1977). The rise occurred on the final syllable (see Figure 1). Gårding (1979) further assumes that intonation in Swedish Y/N questions is also characterized by an overall wider F0 register in comparison with statements, where the local widening of the F0 range is thought to be the most important cue to questions associated with the sentence (focal) accent (see Figure 2). In a perception study, House (2003) showed that, in

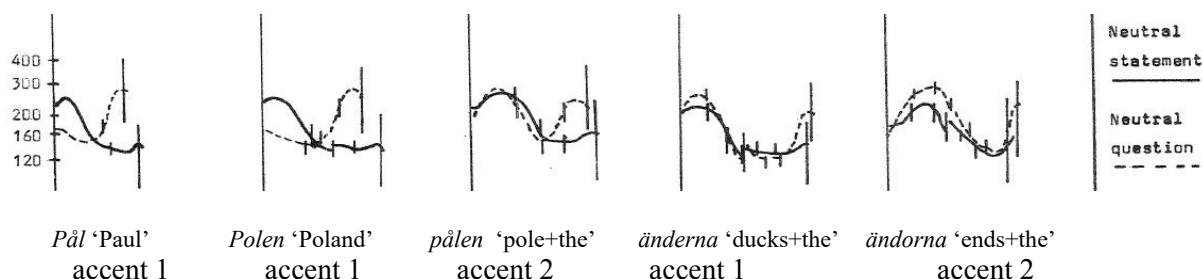


Figure 1. Figure adapted from Gårding & Lindblad (1973) showing differences between statement and question intonation on final focused words in Southern Swedish. Question intonation is characterized by a final rise. The vertical lines represent boundaries between segments.

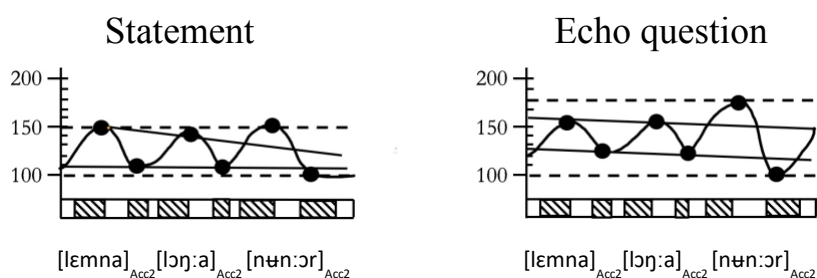


Figure 2. Figure adapted from Gårding (1979) showing statement (left) and echo question (right) intonation in Southern Swedish. Question intonation is characterized by a wider F0 register, most clearly visible on the rightmost prominent word in the utterance Lämna långa nunnor 'Leave tall nuns'.

Central Swedish, a combination of raised F0 range and delayed utterance-final focal peak is an effective cue to interrogative mode in echo questions.

In order to investigate the extent to which intonational cues to questions occur in a more extensive material, we examined statements and questions (both Y/N questions and Wh-questions) in dialogues led by a speaker from Skåne (Malmö).

## Method

Two spontaneous/extemporaneous dialogues between a well-known male Southern Swedish journalist (Sven Melander) and two different political leaders (Jonas Sjöstedt and Jimmy Åkesson) were used. The dialogues contained approximately 2 hours of speech in total. All Y/N questions (n=38) and Wh-questions (n=37) produced by the journalist were extracted from the dialogues. To compare question intonation to statements, 37 statements were also extracted from the material. The Y/N questions had Verb-Subject word order and the statements had Subject-Verb word order. The subjects were pronominal in 100% of the Y/N questions and in 95% of the statements. In order to compare the extent of final rises in questions with question

syntax (wh-words, Subject-Verb inversion) and in utterances functioning as questions but without question syntax, we also extracted 24 utterances that were introduced as Y/N questions by the interviewer.

Presence of final rises in Y/N questions, Wh-questions, and utterances without question syntax was registered. In addition, to obtain a measure which could reflect differences in register width between statements and questions, the maximal F0 on the first prosodic word (PW) in all utterances and the maximal F0 on the prosodically most prominent word following the first prosodic word was also measured. In Y/N questions, the F0 on the first prosodic word corresponded to the highest F0 on the PW consisting of V-Pro and in statements on the PW consisting of Pro-V. In the 2 cases where the subject was non-pronominal, the F0 was measured on the subject noun. In Wh-questions, the first PW corresponded to the Wh-word. Examples of the three sentence types are given in Figures 3-5.

Statistical analyses were carried out using two-sided independent samples t-tests. P values were Bonferroni-corrected for multiple comparisons. An F0 difference of 1.5 ST was taken as a threshold for assuming a significant difference

between the categories. This threshold is based on results in Rietveld & Gussenhoven (1985), suggesting that a difference of 1.5 ST is sufficient to cause a difference in the perception of prominence.

## Results

### Final Rises

#### *Rises in utterances with question syntax*

In the Southern Swedish questions with question syntax, rises occurred in 6 Y/N questions (16%) and 1 Wh-question (3%).

#### *Rises in utterances without question syntax*

In the utterances without question syntax (n=24), 19 (79%) exhibited final rises. Examples are given in Figure 6 and Figure 7.

### F0 register

#### *First PW*

The mean F0 on the first PW in Y/N questions (10.3 ST) and Wh-questions (11.1 ST) was significantly higher than in statements (7.6 ST),  $p < 0.001$ . There was no significant difference in F0 on the first PW between Y/N questions and Wh-questions,  $p = 0.478$ .

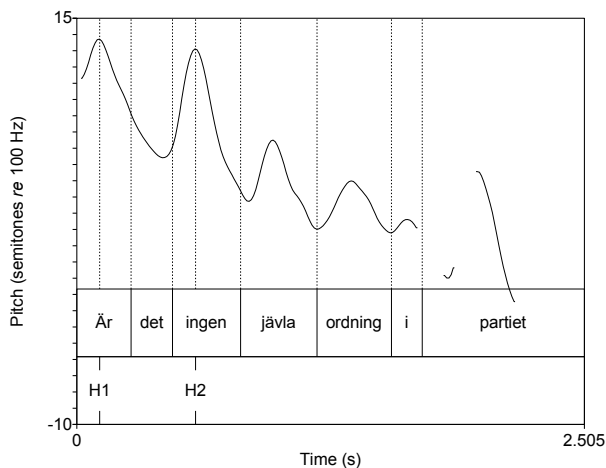


Figure 3. Example of a Y/N question: *Är det ingen jävla ordning i partiet?* 'Is there no damn discipline in the party?' H1 and H2 indicate the points where F0 was measured in the first prosodic word and the following most prominent word, respectively.

#### *Most prominent word after first PW*

The mean F0 height on the most prominent word following the first PW was significantly greater in Y/N questions (12.6 ST) than in Wh-questions (10.9 ST),  $p = 0.033$ , and statements (10.0 ST),  $p = 0.003$ . There was no significant difference in F0 between Wh-questions and statements in this position,  $p = 0.290$ .

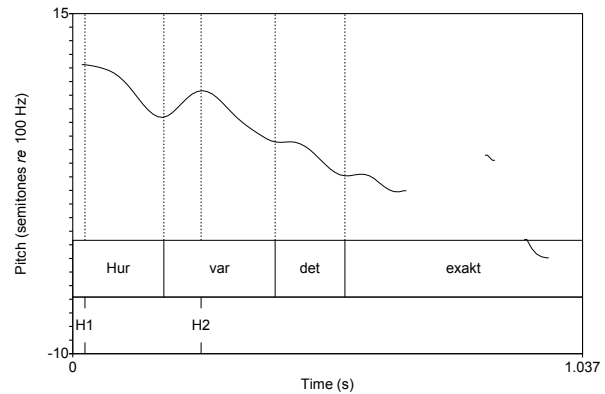


Figure 4. Example of a Wh-question: *Hur var det exakt?* 'How exactly was that?' H1 and H2 indicate the points where F0 was measured in the first prosodic word and the following most prominent word, respectively.

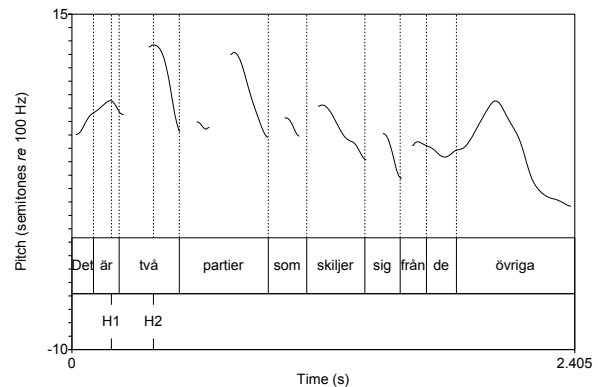


Figure 5. Example of a statement: *Det är två partier som skiljer sig från de övriga.* 'There are two parties that are different from the others'. H1 and H2 indicate the points where F0 was measured in the first prosodic word and the following most prominent word, respectively.

## Discussion

The results presented here show that question intonation in Southern Swedish can be realized through a number of different prosodic cues. Firstly, in line with previous results for Central Swedish (House (2004, 2005)), they illustrate the

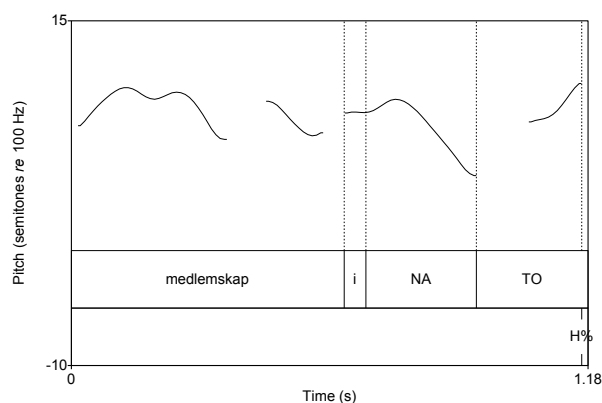


Figure 6. Example of a rise (H%) on the final syllable of NATO (accent 1) in the phrase *medlemskap i NATO?* 'membership in NATO?'

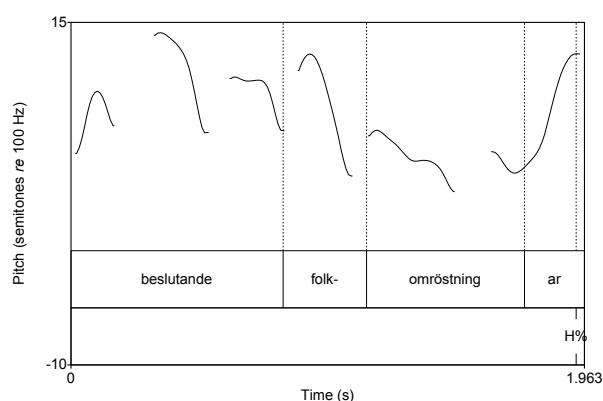


Figure 7. Example of a H% on the final syllable of the phrase *beslutande folkröstningar?* (accent 2) 'decisive referendums?'

non-obligatoriness of final rises as cues to questions. They also show that the use of final rises in Y/N questions is greater in utterances that do not have question syntax. The results further indicate that syntactic differences interact with differences in F0 register at the onset of questions and statements. In line with the model for Swedish intonation presented in Gårding (1979), a higher register was observed for questions than statements, not only for Y/N questions as studied by Gårding, but also for Wh-questions. Moreover, in agreement with Gårding (1979), the wider register extended from the onset to the following most prominent (focussed) word, but only in Y/N questions. In Wh-questions, this continued heightened register was not found.

These findings on the relation between syntax and prosody are in line with approaches to grammar such as Rizzi & Bocci (2017), where operators representing different speech act types are assumed to be part of the syntactic representation. The register differences seen in the data studied here could be assumed to be intonational reflexes of these illocutionary force operators for Y/N questions and Wh-questions.

The differences in F0 height associated with prominences to the right of the first prosodic word can be thought to reflect the scope of the question operator. Whereas the question operator in Y/N questions is assumed to dominate focus, and have scope over the whole sentence, in Wh-questions, it is assumed to overlap with focus on the Wh-word (Rizzi & Bocci (2017)).

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