ABSTRACT
The SIMULEKT project aims to develop our knowledge about the major intonational varieties of Swedish using the Swedish prosody model and various forms of speech synthesis. In a pilot production-oriented perception test, listeners were able to identify Svea and North Swedish stimuli from intonation only. Our method will be used in further studies of Swedish dialectal variation.

1. SIMULEKT
Simulating intonational varieties of Swedish
Joint research project Lund - KTH funded by the Swedish Research Council 2007-9

Goals:
- Gain more precise knowledge about the major intonational varieties of Swedish:
  - Develop the Swedish prosody model theoretically and experimentally
  - Simulate the prosody of these varieties using speech synthesis

2. Two speech databases
Swedia 2000
- 1200 speakers of Swedish (100 communities in Sweden & Finland)
- Elicited & spontaneous speech

SpeechDat
- 5000 speakers (18 dialect areas)
- Read, telephone-transmitted speech
- Two prosodically interesting sentences

3. The Swedish Prosody Model
Bruce & Gårding (1978)
Bruce & Granström (1993)
Bruce (2007)

Tentative taxonomy of intonational varieties of Swedish

4. Comparing Svea and North intonation
Similar word intonation (accents):

Different phrase & utterance intonation
According to taxonomy, two intonational parameters differ:
1. Number of intonational prominence levels (focal/non-focal accentuation)
2. Concatenation patterns (between tonal gestures of prominent words)

5. Production-oriented pilot perception test
Hypothesis: Listeners can identify an utterance as North or Svea Swedish from the 2 intonational parameters only

6. Test design: Software with clickable square
Method: Stimuli generated from subjects’ clicks in a square on the screen
Coordinates (x,y) control gradual shift between Svea and North realizations using 2 parameters:
x: Intonational prominence levels
  (Points 1 & 3)
y: Concatenation patterns (Point 2)

Origo (0,0) set to Svea; (99,99) to North (changed during the test)

Test design: 6 parts:
- 3 identification tasks: Identify the most Svea, the most North, ambiguous
- 2 stimulus types: Real utterance, reiterant utterance
14 students (8 females, 6 males, mean age 24) participated

7. Listeners identified North and Svea stimuli from intonation only
Results: Significant differences between the coordinates for the 3 tasks (Svea, North, Ambiguous)
- ANOVA (Repeated measures, 2 factors)
  - For x: F(2,26)=5.991, p<.05
  - For y: F(2,26)=20.263, p<.05
No significant differences between the 2 stimulus types (real/reiterant)

8. Discussion & future work
Encouraging preliminary results:
- Useful method for testing perception of intonational varieties
- Demonstrate impact of intonational parameters on listeners’ perception of Swedish varieties.

A fairly large dispersion of the results may be explained by the listeners’ dialectal origin (South) and varying familiarity with Svea and North Swedish.

We will develop our method further to include other intonational parameters and Swedish varieties.