Prosodic measurements and question types in the Spontal corpus of Swedish dialogues

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Investigate and describe intonational variation in questions in spontaneous dialogue.

Is there a standard type of question intonation?
Question intonation

• Declarative => Interrogative
  ”You like apples.” vs. ”You like apples?”

• Different question types, different intonation
  Y/N questions: Wh-questions:

• Where is the rise in conversational speech?
Spontal corpus

• 60 hours of dialogue / 120 half-hour sessions

• Talk freely about anything
Question extraction

- 24 dialogue subset (= 12 hours)
- Talkspurts based on voice-activity/silence
- Orthographic transcriptions

- Two annotators tag "questions"

908 talkspurts with question tag

600 selected

(Spontal balance, 2+ annotators agreeing)
Question markup

Ser du att det är hål i botten?
Do you see there’s a hole in the bottom?

• Q1: [Y/N] [Wh] [Alt’s] [Other]
• Q2: [Required] [Optional] [Prohibited]
• Q3: [Forward] [Backward]
• Q4: [Reported] [Direct]
Question types

- **Q1**: Y/N > Wh >> Alt’s & Other
- **Q2**: Required >> Optional > Prohibited
- **Q3**: Forward >> Backward
- **Q4**: Direct >> Reported
Prosodic measures

**TIME**
- Duration
- Speech rate

**PITCH**
- Variation
- Rising/Falling intonation
  
  \[ \text{DIFF: } (\text{Avg pitch})_{2\text{ndHalf}} - (\text{Avg pitch})_{1\text{stHalf}} \]
• Significant differences between (almost) all Q1 categories
• **Forward**-directed questions longer
• Other are slower
• Optional are slower
• Backward are slower
Pitch variation

- More varied pitch in questions to which answers are **Optional**
- More varied pitch in **Backward**-directed questions
- Reflecting attitude?
Rising/Falling intonation

- **Y/N** falling, **Wh** rising (or flat)
- **Forward** falling, **Backward** rising (or flat) – but large variation
Rising/Falling intonation (cont.)

- Tycker du inte? (Don’t you think?)
- Är det sant? (Is that true?)
- Jaha? (Oh yeah?)
- Vad sa du? (What’d you say?)

Rising intonation signalling non-understanding/non-acceptance?
Conclusions

• Strengths of coding scheme:
  – General
  – Quick-and-easy
  – Orthogonal, allows clustering across different dimensions

• Interplay across different dimensions

Optional + Backward $\rightarrow$ More pitch variation $\rightarrow$ Attitude?

Other + Optional + Backward $\rightarrow$ Slower $\rightarrow$ Uncertainty? Non-agreement?
Thank you for your attention!
Question markup

Vad betyder det?
What does that mean?

• Q1: [Y/N] [Wh] [Alt’s] [Other]
• Q2: [Required] [Optional] [Prohibited]
• Q3: [Forward] [Backward]
• Q4: [Reported] [Direct]
Rising/Falling intonation (cont.)

- DIFF: Y/N falling, Wh rising; Backward rising
  But... confusion with sentence focus?

- PROS: No significant dependencies...
Summary: Prosodic measures

• Duration: Dependent on number of alt’s
• Speech rate: Slow reflecting uncertainty?

• Pitch variation: Reflecting attitude?

• Rising/Falling intonation:
  – DIFF: Dependent on sentence focus?
  – PROS: Not dependent on question type