Phonetic correlates of stance-taking

Valerie Freeman, Richard Wright, Gina-Anne Levow, Yi Luan, Julian Chan, Trang Tran, Victoria Zayats, Maria Antoniak, Mari Ostendorf

2pSC18
ASA 2014 Fall Meeting
Indianapolis, Oct. 27-31

Goal
Identify acoustic indicators of stance (utterance level)

Stance
Attitudes, opinions about topic of discussion [1-2]

References

Future Work
• Content analysis, annotation of stance moves [9-10], e.g.: Offer, solicit, accept, reject, support, soften a stance
• Hesitate to accept a stance, offer alternatives
• Agree, disagree, negotiate, encourage/discourage
• Fine-grained polarity analysis
• Word-level acoustic analysis
• Correlate stance with variation in pronunciation, e.g.: Vowel space expansion, area of convex hull
• Energy modulation spectra

ATAROS Corpus
34 dyadic conversations
• Matched/crossed gender
• Matched by age group
• ~1 hour each
5 collaborative tasks [3-5]
• Stance-dense
• Differing involvement

Tasks

Stance-Neutral
Map
Dyads discuss how arrangements of ~50 household items differ between two lists

Category
Dyads discuss how arrangements of ~50 county services differ between two lists

Increasing Involvement
Inventory
Dyads arrange household items to make a store inventory map

Survival
Dyads pick items useful for cold-weather survival

Budget
Dyads choose items to cut from an imaginary county budget

Analysis
Sample
• 2 tasks (Inventory, Budget)
• 18 dyads
• ~8900 spurts

Measures (spurt-level)
• Speech rate
• Pitch mean, range
• Intensity mean, range
• Extracted via Praat script

Stats (ANOVA, paired t-tests)
• Stance Strength has a significant effect on all measures
• For each measure/graph, all pairs of strength levels differ reliably except those shown as touching

Results
• As stance strength increases, so do speech rate, pitch and intensity means and ranges
• In other words, strong stances are said faster, louder, and with wider variation in pitch and intensity
• Phonetic correlates of stance can be found even at a coarse spurt level
• Boxes show 2 quartiles; notches 2 standard deviations around medians; whiskers ranges; outliers not shown

Transcription
• Forced-alignment: P2FA [8] marks word, phone edges

Annotation
Each “spurt” (utteration between 500ms+ silences) marked for stance strength [4-5]:

None: reading, backchannels, facts
Ex: “What’s next?” / “Socks.”

Weak: cursory agreement, suggest solution, solicit opinion, mild opinion/reasoning
Ex: “How about this? / “Sounds good.”

Moderate: stronger versions of above, disagreement, offer alternate solution, question other’s opinion
Ex: “No, let’s do this.”

Strong: very strong versions of above
Ex: “Absolutely not!”

Updates & Access
For reports and corpus access:
depts.washington.edu/phonlab/projects.htm

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