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Phonetic marking of stance in a collaborative-task spontaneous-speech corpus

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Stance

- subjective attitudes, opinions about topic of discussion [1-2]

Goals

- Build a stance-rich audio corpus of unscripted conversation
- Develop, apply stance annotation schema
- Automatically extract acoustic measurements
- Identify acoustic measures indicative of stance
- Automatically identify stance from acoustic signal

Motivation

- Stance essential to collaboration, negotiation, decision-making
- Automatic detection of sentiment/subjectivity has used written text [3-5] or lexical traits of spoken corpora [6-12], but more info is available in the speech signal [13-15]
- Existing corpora have low density of stance-taking, may have low audio quality, many uncontrolled speaker/situational factors

Transcription

- Manual orthographic transcription in Praat [19] following ISCI guides [20]
- Force-alignment using P2FA [21] to mark word and phone boundaries

ATAROS Corpus

- 5 collaborative tasks
- Unscripted, dyadic conversation
- High density of stance moves
- Differing levels of involvement
- Speaker factors (sources of variation) known, controlled [16-18]:
  - Dialect region (Pacific Northwest)
  - Gender (same or mixed)
  - Age 18-75 (matched generation)
  - Strangers, no designated leader
- High audio quality
  - Sound-attenuated booth
  - Head-mounted microphones

Annotation

Coarse:

Each "spurt" (utterance between 500ms+ silences) marked for polarity (positive, negative, neutral) and stance strength:

0. None: reading, backchannels, facts
1. Weak: cursory agreement, suggest solution, solicit opinion, mild opinion/reasoning
2. Moderate: stronger/emphatic versions of items in #1, disagreement, offer alternate solution, question other's opinion
3. Strong: very strong versions of #1-2

Fine (under development):

Relies on lexical content, based on pilot, prior work [13-14]. Mark stance indicators:

- Overt evaluation, modifiers, intensifiers
- Cite evidence, experts, own experience
- Negotiation, persuasion
- Agreement, disagreement

Tasks

- 2 sets, each with ~50 items covering W. American vowels
- 2 stance-neutral baseline tasks
- 3 increasing in involvement

Household Items Set

Budget Set

Neutral Tasks

1. Map

- Each speaker has a different "superstore map" with names of the same ~50 household items arranged in columns ("aisles")
- Dyads discuss how arrangements differ

M 56: My clothing items are at the bottom of th- of the third column.
F 96: Okay.
M 56: So, I have things like jackets, shoelaces, socks,
F 96: Yeah.
M 56: vests, coats, sweaters, boots, hats.

4. Category

- Each speaker has an "audit list" with ~50 imaginary country services arranged in categories ("departments")
- Dyads discuss how arrangements differ

F 92: I do have additional bus stops.
M 54: It's under that same category?
F 92: Yes.
M 54: Okay.

Increasing Involvement Tasks

2. Inventory

- The same ~50 household items printed on Velcro-backed cards
- Dyads arrange items on felt-covered wall representing a store inventory map

F 89: And then, for boxes of doughnuts, um -
M 53: Do we wanna put it next to ice cream?
F 89: Or maybe next to - .. Yeah, we can do that.

3. Survival

- The same ~50 items on screen with survival scenario: on a sinking ship, found raft, items
- Dyads choose items to take for cold-weather survival

F 96: Um, backpack?
M 56: Well, we don't have that much to carry, so I think it would actually - since we're probably gonna try to hike out .. I think the backpack would just slow us down.
F 96: I think so.

5. Budget

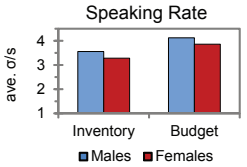
- The same ~50 county budget items arranged in 4 departments
- Dyads decide which items to cut

M 59: Football equipment - Are they buying football equipment for kids?
F 101: Mm-hm.
M 59: Cuz we don't need that.
F 101: Like new football equipment?
M 59: Yeah. Make 'em pay for it on their own.

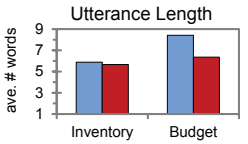
Task Validation

- Compare Inventory & Budget Tasks (low vs high involvement)
- Sample: 12 dyads (total 6 males, 6 females)

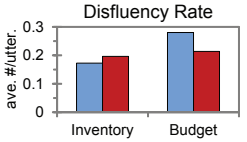
- Faster speech in Budget Task



- Longer utterances in Budget Task, esp. for males



- More filled pauses ("uh, um") and truncated words in Budget Task, esp. for males



Future Work

- Goal: 30 dyads, even mix of ages, genders
- Fine-grained stance annotation
- Prosodic analysis
- Correlate stance, involvement with acoustic measures indicating hyperarticulation, e.g.:
  - Vowel space expansion, area of convex hull
  - Energy modulation spectra

Updates & Access

- For current reports and future corpus access: depts.washington.edu/phonlab/ projects/

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