

# Exploring task and gender effects on stance-taking in a collaborative conversational corpus

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# Terms

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- Stance
  - Speaker's attitudes, opinions, feelings, judgments about topic of discussion (Biber et al. 1999; Conrad & Biber 2000)
    - Related: evaluation, attitude, sentiment, subjectivity
  - Stance-taking: Activity of expressing stance (Haddington 2004)
- Stance act
  - Speech act involving stance

# Terms

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- ATAROS Project
  - Automatic Tagging and Recognition of Stance
  - Collaboration with phoneticians, computational linguists, signal-processing engineers
    - Hosted at the University of Washington
  - Seeks automatically-extractable acoustic cues to stance
    - Also Marvel god of video games →



# Related Work

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- **Conversation Analysis & Discourse Analysis**
  - Qualitative, often small amounts of data
    - (e.g., Biber & Finegan 1989, Conrad & Biber 2000, Du Bois 2007, Englebretson 2007, Haddington 2004, Hunston & Thompson 2000, Jaffe 2009, Ogden 2006)
- **Computational Linguistics/Speech Recognition**
  - Often relies on text or lexical features, but much more information is available in the speech signal
    - (e.g., Murray & Carenini 2009, Hillard et al. 2003, Somasundaran et al. 2006, Wilson 2008, Wilson & Raaijmakers 2008, Raaijmakers et al. 2008)

# ATAROS Corpus

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- High-quality audio
- 34 dyads from Pacific Northwest
  - Strangers matched by age
- 5 stance-dense collaborative tasks
- Transcribed, time-aligned to audio
- Annotated for stance strength, polarity, type
- Available to other researchers

# Tasks

	Neutral first-mentions	Increasing involvement
Store items	Map	Inventory Survival
Budget items	Category	Budget

# Inventory Task

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- Scenario: You're co-managers of a new superstore in charge of arranging inventory
- Decide together where to place each target item on a felt wall map
- Low involvement, weak opinions, agreement

# Inventory Task

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- W- We should-
- So, fridge-
- We should- make a- a- a decision where beverages should go, anyway. So, it doesn't-
- Yeah.
- I don't think it's a big... huge decision to s-
- We could do b- beverages like here.
- Sure.
- Maybe.
- Perfect.



# Budget Task

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- Scenario: You're on the county budget committee, and it's time to make cuts
- Decide together which expenses to cut from each department
- High involvement, stronger opinions, more persuasion, reasoning, negotiation, personal experience as support

# Budget Task

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- {breath} Alright. .. Wh- Poetry books .. or cooking classes?
- No, if you're gonna leave in football, we need poetry.
- Oh we're not g- Oh - oh, I'm willing to take out - {breath}
- Oh, football equipment?
- Yeah.
- Oh.
- So if we take out the juice machines and football, we've done it.
- Okay.



# Transcription & Annotation

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- Manual orthographic transcription in Praat (Boersma & Weenink 2013)
- Forced-alignment w/ P2FA (Yuan & Liberman 2008)
  - Aligns word and phone boundaries with audio
- Manual stance annotation
  - Identify and label “stancey” expressions via content analysis (modified from Freeman 2014)

# Annotation

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- Stance strength
  - None
  - Weak
  - Moderate
  - Strong
- Polarity
  - Positive
  - Negative
  - Neither/neutral
- Stance act types, e.g.:
  - Offer, solicit, accept, reject opinion
  - Persuasion, hedging, reluctance
  - Rapport-building
  - Backchannels

# Predictions

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- Measurable cues to stance type, strength, polarity are present in the acoustic signal
  - Same words, different messages...
- Variation by task
  - Style, involvement
- Variation by sex/gender
  - Speaker and/or interlocutor

# Dyads (Sample)

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Group	Ages	Dyads by sex			<i>Sums</i>
		FF	MM	MF	
Younger	(18-32)	3	1	6	10
Middle	(38-49)	1	1	3	5
Older	(60-75)	3	1	1	5
<i>Totals</i>		7	3	10	20

Total F: 24 M: 16

# Measures

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- Between tasks
  - Task duration, spurts/speaker, spurt length, speaking rate
    - Spurt: speech of a speaker between >500ms pauses
    - Rate in vps (vowels/sec, proxy for syllables/sec)
- Within dyad
  - Stance acts by type
    - Stance act: speech act involving stance

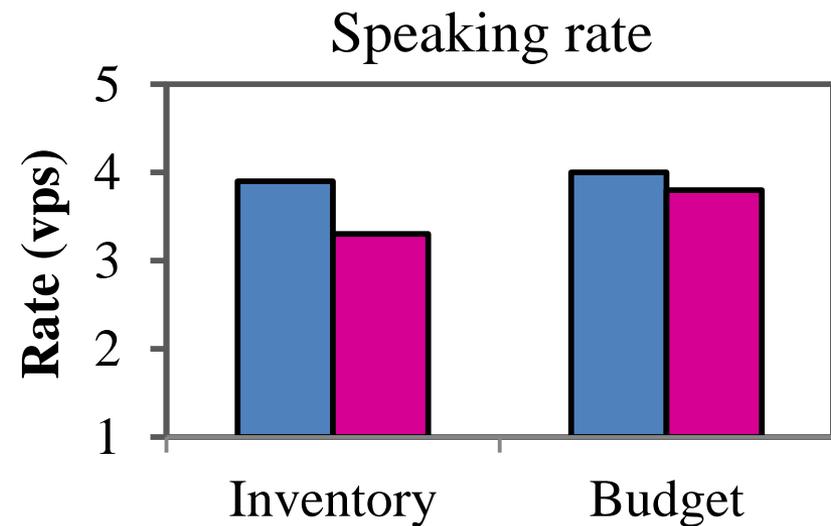
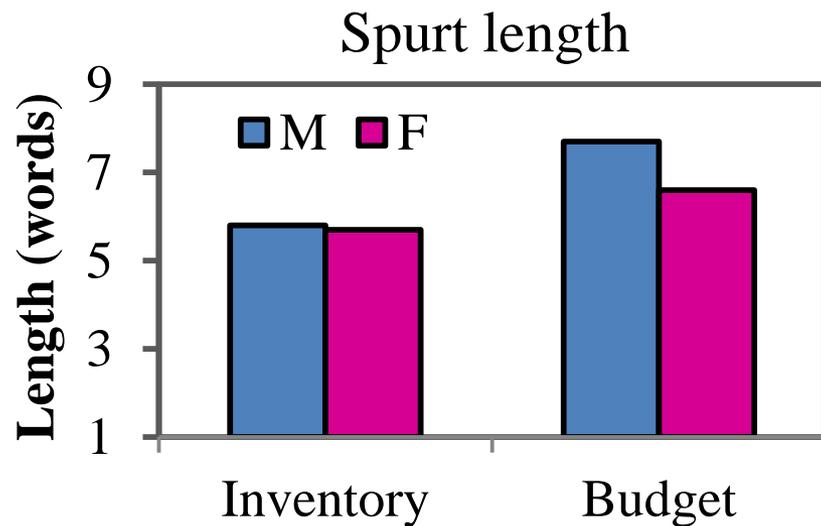
## Task Differences

Measure (means)		Inventory	Budget	<i>signif.</i>
Task duration (min)		12.5	13.6	ns
Spurts/speaker (n)		154	142	ns
Spurt length (words)		5.7	7	$p < 0.001$
Speaking rate (vps)	F	3.3	3.8	$p < 0.001$
	M	3.9	4.0	ns

- Faster speech, longer utterances = higher involvement in Budget task

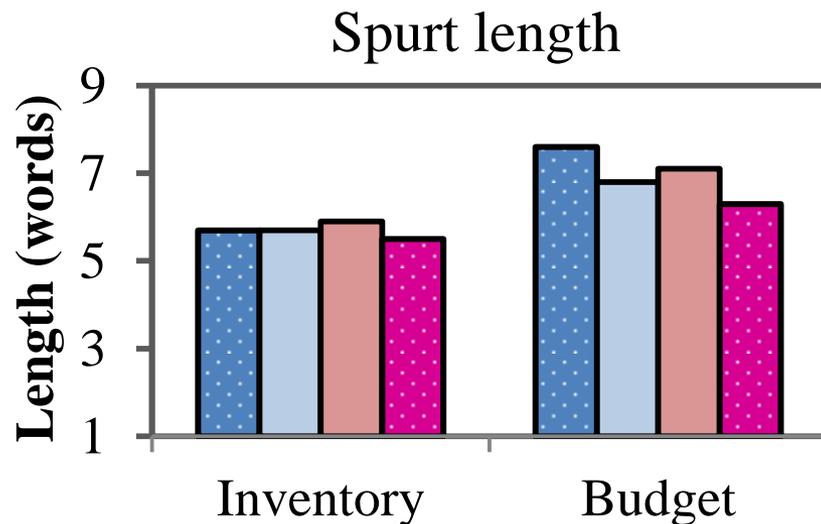
# Task & Speaker Sex

- Spurts longer in Budget
- Effect greater for men
- Speaking rate: women speak more slowly in Inventory



# Speaker & Partner Sex

- Longer spurts when talking to men
  - Women with male partners (both tasks)
  - Men with male partners (Budget only)

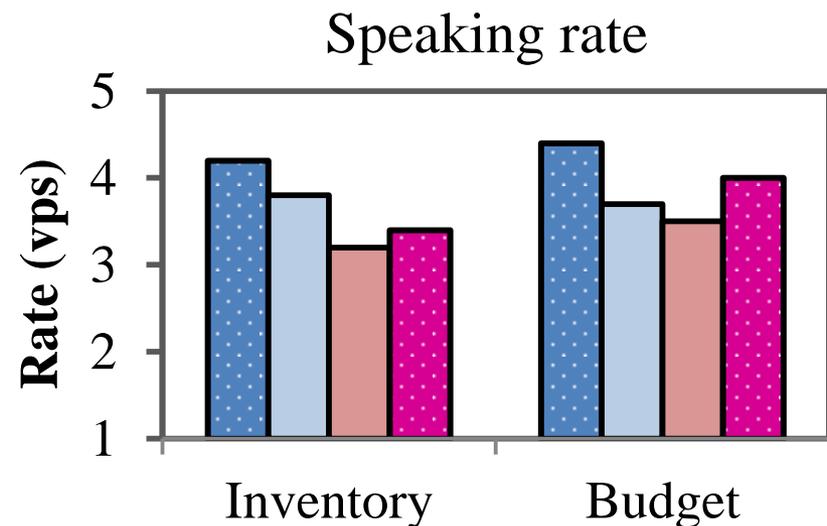


Speaker	Partner	
	M	F
M	■	■
F	■	■

# Speaker & Partner Sex

- Faster speaking rates in same-sex groups
  - Women with female partners (both tasks)
  - Men with male partners (both tasks)

Speaker	Partner	
	M	F
M		
F		



# Stance Types within Dyad

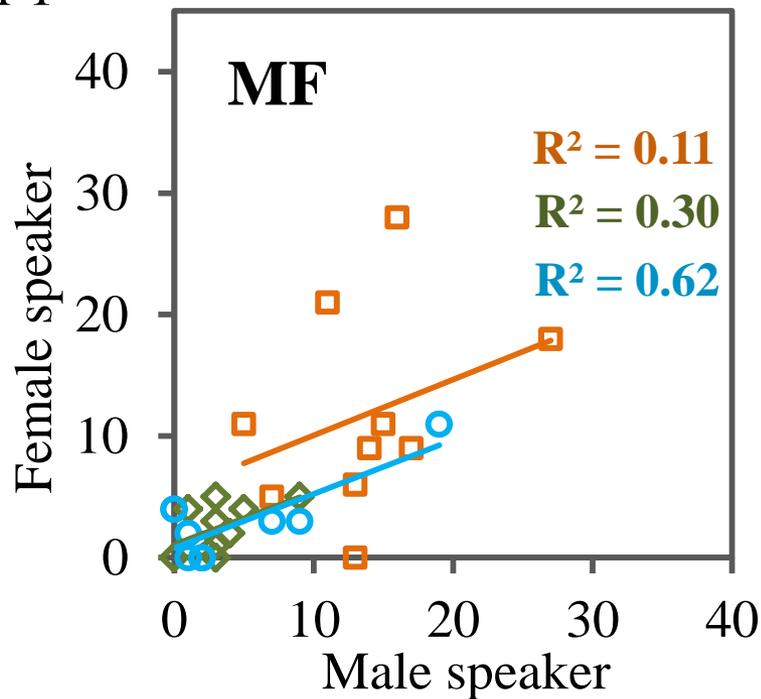
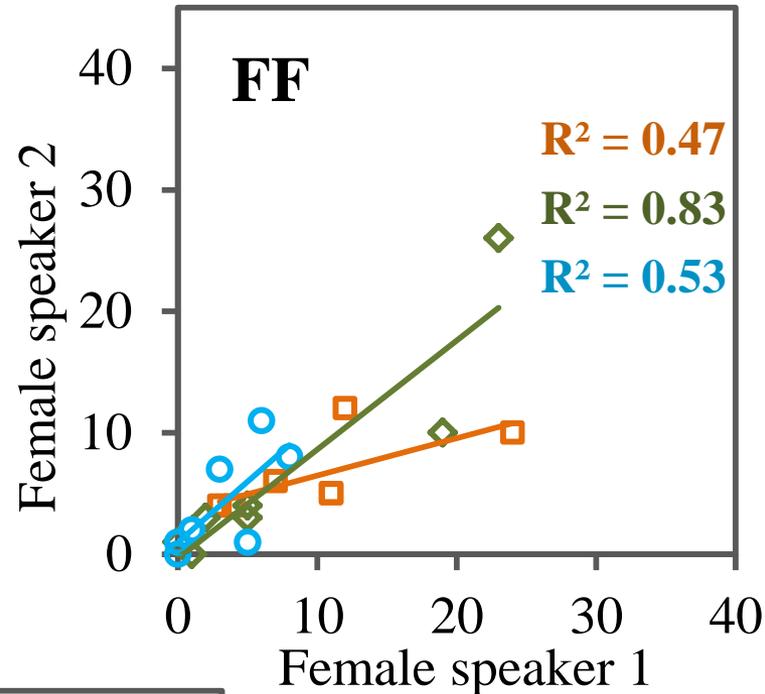
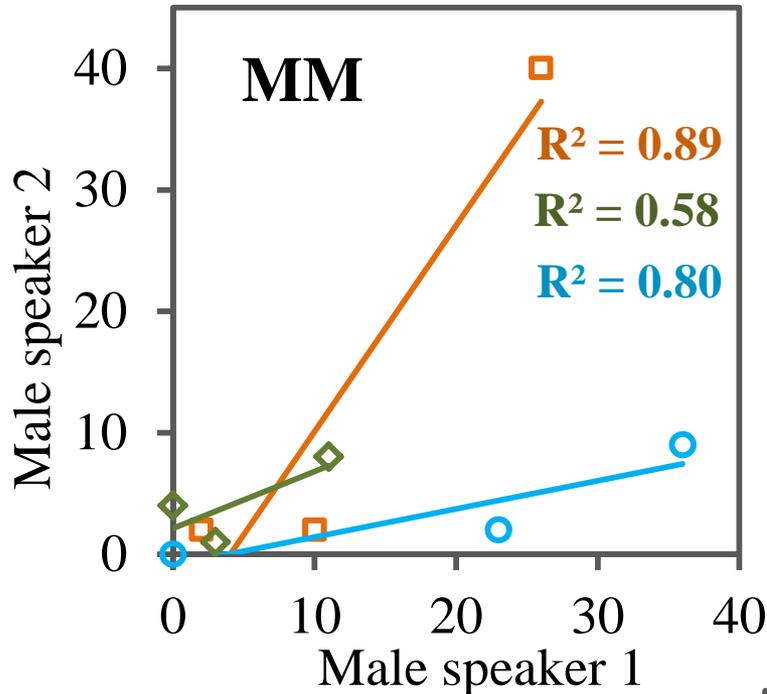
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- Frequent act types
  - Offer opinion, Agree, Convince (w/ reasons)
    - total 45%-65% of acts within each dyad
- Infrequent
  - Solicit opinion, Rapport-build, Soften opinion
    - total 6%-23% of acts within dyad
- Very infrequent
  - Disagree, Reluctance, Backchannel
    - total 1%-9% of acts within each dyad

# Stance Types within Dyad

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- Some types may have a reciprocating effect
  - Partners use similar numbers of acts
    - Rapport-building
    - Disagreement
    - Backchannels
  - Especially in same-sex dyads



# of Acts  
w/in Dyad

# Conclusion

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- Utterance length & speaking rate
  - Task effects (~style/involvement)
  - Gender effects within each task
- Stance types
  - Reciprocal effects in same-sex groups
- Many avenues for future work...
  - Age, power, rapport dynamics
  - Record friends, cross ages, change partner gender

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# Thanks

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