Toward a Model of Face-to-Face Grounding

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Problem statements

Observation:

Verbal and Nonverbal signals participate the grounding process in face-to-face conversation

- What predictive factors account for how people use nonverbal signals to ground information?
- How can a model of the face-to-face grounding process be used to adapt dialogue management to face-to-face conversation with an ECA?





Data coding

- Verbal behaviors
 - Annotating dialogs
 - By tokenizing a turn into utterance units (UU)
 - DAMSL coding scheme (Dialog Action Markup in Several Layers)
 - It marks the role in the dialog and their relationship to each other

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- Focusing on four categories in the statistical analysis
 - Acknowledgement
 - Answer
 - Information request
 - Assertion

Data coding

Nonverbal behaviors

□ 16 combinations

Combinat NVs	ions of	Listener			
		gP	gM	gMwN	gE
speaker	gP	gP/gP	gP/gM	gP/gMwN	gP/gE
	gМ	gM/gP	gM/gM	gM/gMwN	gM/gE
	gMwN	gMwN/gP	gMwN/gM	gMwN/gMwN	gMwN/gE
	gE	gE/gP	gE/gM	gE/gMwN	gE/gE

Results Basic Statistics Differences between F2F vs. SR F2F SR No. of UUs 1088 1145 Mean length of 3.24 min. 3.78 conversations Mean length of 4.43 5.26 words utterances * per UUs NV status shifts * 887 425 10

Result

Correlation between verbal and nonverbal behaviors
NV status shifts with respect to the type of verbal communicative action

<Salient transitions: the most frequent shifts in F2F>

	Shift to	
	within UU	Pause
Acknowledgement	gMwN/gM (0.495)	gM/gM (0.888)
Answer	gP/gP (0.436)	gM/gM (0.667)
Info-req	gP/gM (0.38)	gP/gP (0.5)
Assertion	gP/gM (0.317)	gM/gM (0.418)

Ju • (ldgmer Grounding	nt of g Model	groundir for MACK	ıg	
	Target UU Type	Evidence Type	NV Pattern	Judgment of ground	Suggested next action
	Assertion	positive	within: map pause: map /nod	grounded	go-ahead: 0.7 elaboration: 0.30
		negative	within: gaze pause: gaze	ungrounded	go-ahead: 0.27 elaboration:0.73
	Answer	positive	within: gaze pause: map	grounded	go-ahead: 0.83 elaboration: 0.17
		negative	pause: gaze	ungrounded	go-ahead: 0.22 elaboration: 0.78

valuat	ion		
Prelimina	ry evaluation		
		with-grounding	w/o-grounding
nun	n of UUs	5	4
	gMgM	3	2
	gPgM	2	0
Shift to	gMgP	1	0
Shift to	gPgP	1	0
	gMgMwN	0	1
	total	7	3

