Alignment is a Function of Conversational and Relational Dynamics

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Introduction

When people interact, they often align both verbally and nonverbally (e.g., Cleland & Pickering, 2003; Shockley, Santana, & Fowler, 2003). Several researchers have argued that such alignment occurs due to a process called grounding, in which interlocutors align and seek such alignment from others as a clue that they understand each other (e.g., Clark & Brennan, 1991). Nonverbal cues are argued to be a key part of grounding, such as watching for a smile as one tells a joke.

Computer-mediated text-only environments such as instant messenger make such cues absent. Alignment, however, has been found in interactions between a human and computer (e.g., Branigan & Pearson, 2006), leading researchers to suggest that priming is a better explanation than grounding (e.g., Ferreira & Bock, 2006). Priming suggests that when two interlocutors communicate, alignment is a result of each interlocutor priming the other; for example, a speaker will activate certain words and syntactic features for a listener, who in turn uses those features when he or she becomes the new speaker.

Such results, however, are difficult to interpret because it is possible that participants had expectations regarding whether the computer was capable of understanding communication and they shaped their responses in order to ensure fewer problems with the interface. With this in mind, we test grounding and priming theories in computer-mediated text-only conversations between two human interlocutors.

Experiment 1

Forty-two participants engaged in a 30-minute instant messaging conversation with a confederate, debating whether Gardasil should or should not be a mandatory vaccination. During the debate, the confederate either disagreed with the participant (n = 21) or was neutral about the topic. (Fig. 1)

Experiment 2

Thirty-five dyads of friends engaged in two 20-minute instant messaging conversations: A social conversation in which they were free to discuss any topic, and a debate in which they took opposing sides on whether or not the University should charge printing fees on a per-use or tuition-based scale.

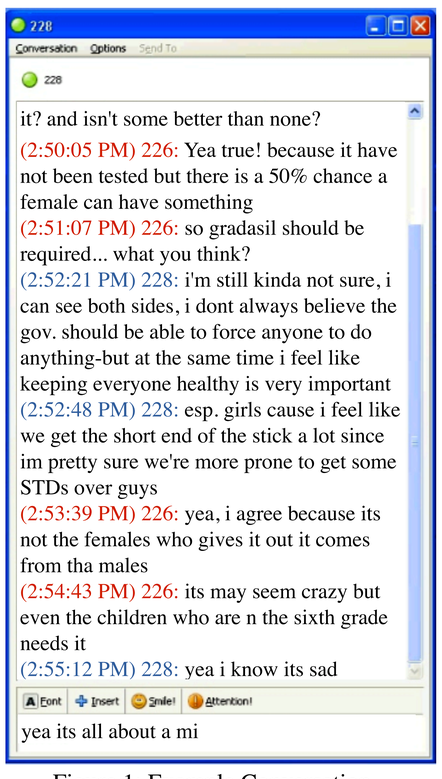

Figure 1: Example Conversation

Results

See Tables 1 and 2 for results of linear mixed-effects models. Log transformations were necessary due to gamma distributions; tables report non-log-transformed values.

Length = The difference between the number of words in one interlocutor's turn and the other interlocutor's immediately following turn.

Duration = The difference between the number of seconds one interlocutor's turn lasted and the other interlocutor's immediately following turn lasted.

% Parts of Speech = The difference between one interlocutor's turn and the other interlocutor's immediately following turn in the percentage of words that are identified as verbs, pronouns, prepositions, and conjunctions by the software program Linguistic Inquiry and Word Count (LIWC; Pennebaker, et al., 2007).

% Affect Words = The difference one interlocutor's turn and the other interlocutor's immediately following turn in the percentage of words in one turn that are identified as positive emotion words and negative emotion words by LIWC.

ESA Score = Score of semantic relatedness generated by the Explicit Semantic Analysis method (Gabrilovich & Markovitch, 2007).

Results show strangers (Exp. 1) and friends (Exp. 2) had differing patterns of paralinguistic, linguistic, affective, and semantic alignment. Friends tended to align more than strangers, and alignment tended to increase with continued conversing. Alignment was significantly affected by the type of conversation for friends, but not for strangers, and both groups showed interactions with conversation type as conversation continued.

	Intercept	If Disagree (as Opposed to Neutral)	Each Additional Turn	Disagree X Additional Turn
Length (words)	9.39	△	▽***	▽**
Duration (sec)	20.91	▽	▽*	▽*
% POS	5.64%	▽	▽	△*
% Affect	2.03%	▽	▽***	△
ESA Score	0.63	▽	△	△

▽= alignment decreased; △= alignment increased.
* p < .05, ** p < .01, *** p < .001.

Table 1. Experiment 1 Results.

	Intercept	If Disagree (as opposed to Social/ Neutral)	Each Additional Turn	Disagree X Additional Turn
Length (words)	6.05	▽***	△	△**
Duration (sec)	9.97	▽***	△**	△**
% POS	8.08%	△***	△***	△
% Affect	3.13%	△*	▽**	△**
ESA Score	1.38	△***	▽**	▽

▽= alignment decreased; △= alignment increased.
* p < .05, ** p < .01, *** p < .001.

Table 2. Experiment 2 Results.

Discussion

The current study suggests that alignment is subject to relational and conversational dynamics that unfold with continued conversing, which supports grounding theory. These effects would not be expected for priming; priming would suggest that we continually synchronize despite conversational and relational dynamics.

This study also generalizes patterns of alignment to a text-only computer-mediated channel, suggesting that nonverbal information considered crucial to grounding theory is either present in a channel in which nonverbal cues are absent, or is unnecessary to the development of grounding. We advocate for the former, and argue that nonverbal information is simply translated into other formats, such as alignment in the length and duration of turns or in explicit statements of affect. As these variables were affected by relational and conversational dynamics, and changed with continued conversing, they may be indicators of socioemotional information.

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