

Pragmatic Alignment: The Coordination of Ironic Statements in Pseudo-Interaction

Jennifer Roche (jroche@memphis.edu)

Rick Dale (radale@memphis.edu)

Gina Caucci (gcaucci@gmail.com)

Department of Psychology, 202 Psychology Building
Memphis, TN 38152 USA

Abstract

Garrod & Pickering (2004) maintain that conversation is easy because automatic alignment at various levels occurs during conversation. Other related theories of alignment have also been proposed for emotional/mood coordination (Hatfield, Cacioppo, & Rapson, 1994). Many studies have evaluated alignment effects at various linguistic levels, but have not yet integrated pragmatic levels in these demonstrations. Two experiments test the impact of primed irony on participant contributions to interaction. Overall, individuals coordinate during interaction at the level of pragmatics (Experiment 1), and this is not explained merely by mood induction through content of irony (Experiment 2). We discuss findings in terms of psycholinguistic alignment and emotional contagion.

Keywords: pragmatics; coordination; dialogue; alignment; synchrony; irony

Introduction

Our understanding of language has often been based on studies of single language processors (e.g., single word/sentence production and comprehension; Bock, 1986; Potter & Lombardi, 1990). While this is a powerful simplifying assumption, natural language is learned and most often occurs in the context of social interactions (Clark, 1992). Currently, there has been a growing research agenda to identify joint action between interlocutors during dialogue (e.g., as compared to "monologue"). Though a longstanding concern (e.g., Clark, 1975), this recent growth has lead several researchers to account for the great ease with which humans process dialogue.

For example, Garrod and Pickering (2004) have proposed a mechanistic model of interactive alignment to explain how effortless conversation naturally occurs. Their model of dialogue explains how individuals maintain, produce, and comprehend dynamic exchanges of information. Theoretically, there is an emergence of shared or "aligned" representations between interlocutors when information is coordinated at various levels of linguistic analysis. An interlocutor has the ability to process information at many levels in order to promote coordination with his/her conversation partner. A fundamental assumption of this model is that the speaker will routinely prime his/her listener at all of the levels of analysis (e.g., phonological, syntactic, and semantic), which creates coordination at each level. This model proposes that priming is the root of all alignment. Once

synchronization occurs, the aligned representations may help speakers form predictions about how to respond during future spoken utterances. Interactive alignment theory states that these predictions provide ways to more efficiently produce and comprehend speech without overloading the cognitive system. Based on this theory, growing alignment may help individuals to coordinate their dialogue through these shared linguistic representations.

As it currently exists, the literature on dialogue assesses various linguistic strategies used during conversation, but it often fails to look at the higher levels of processing. Specifically, there is relatively less research evaluating the alignment of pragmatics (e.g., communication and comprehension beyond what is explicitly stated) during conversation. The linguistic data on its own does not always represent the intention of the individual. For example, Bavelas, Black, Lemery, & Mullett (pg. 6, 1986) suggest, "We don't always say what we mean, and often don't mean what we say." Since priming is a fundamental aspect of the theory of interactive alignment (Garrod & Pickering, 2004), priming pragmatics should lead to alignment of that level during dialogue. The analysis of pragmatic alignment may contribute to further our understanding of intent, a crucial component of daily language (Schober, 1993).

Irony is a common form of pragmatics that exists in dialogue. When interlocutors use irony, they may provide a number of cues related to pragmatic intent. Since the alignment of a dialogue's pragmatics has been scarcely examined, the purpose of this study is to prime interlocutors with ironic statements. Based on interactive alignment theory, individuals should be affected by ironic primes at the pragmatic level and thus increase the probability of responding ironically.

Experiment 1

The purpose of the first experiment is to determine the effect of priming of irony on coordination during a pseudo-conversation.

Method

Subjects. Participants included 27 University of Memphis undergraduate students (mean age = 19.48 years; 23 females). Twenty-six were native speakers of American English, but one participant was a native speaker of African Swahili. All participants reported normal to corrected vision

and no hearing/speech impairments. The native speaker of African Swahili was retained for analysis because his/her responses reflected similar data trends as the others.

Materials. The experiment took place in a private laboratory room. Participants were seated at a comfortable distance from a 20-inch iMac Computer screen. A Razor Carcharias noise-reducing headset (headphones with microphone) was used to present and record acoustic data. MATLAB PsychToolbox-3 programs (Brainard, 1997) controlled stimulus presentation and recorded participant responses for the conversation and rating tasks.

Stimuli. The experimental stimuli consisted of fifteen celebrity pictures collected from the 2005-2007 worst dressed celebrity lists, from TMZ.com. All celebrity pictures were presented on a black background in the middle of the 20-inch computer screen. Five pre-recorded pseudo-confederate statements were scripted for each of the worst dressed celebrity pictures in 3 different connotations, resulting in a total of 225 pseudo-confederate productions (*i.e.*, neutral and two types of irony: exaggerated or understated; Hancock, 2004; see Figure 1 and Table 1 for a sample of the experimental pictures and statements).



Figure 1. Adjusted 590 x 915 pixel worst dressed celebrity stimulus pictures.

Table 1. Sample of pseudo-confederate statements.

Statement	
Irony	Her head looks like an olive on a toothpick.
Connotation	
Not Irony	She is wearing a black jacket.

The pseudo-confederate, a Caucasian female speaker, was instructed to produce these expressions based on her own understanding of each connotation. She produced 75 ironic statements in an exaggerated and understated tone of voice (resulting in 150 total possible ironic statements) and 75 neutral statements from a script designed for each of the celebrity pictures (*i.e.*, 3 types x 5 statements x 15 pictures = 225 recorded utterances). Each pseudo-confederate utterance was equated for RMS amplitude in order to

prevent any acoustic cuing of the experiment's deception. Of the 225 pre-recorded scripted statements, 75 comments were randomly selected and retained for the experimental sessions. The selected utterances were then distributed within three blocks consisting of 25 utterances, which differed by amount of irony (*e.g.*, 2/3, 1/3, and 0/3). The distributions of irony represented three different conditions, which were expressed in terms of the higher proportion, 2/3 being in the beginning, middle, or end blocks. The three pseudo-conversation conditions were counterbalanced between participants.

Procedure. To begin, the participant was seated next to a Caucasian female confederate while completing the informed consent, but separated during the experimental sessions. The first task consisted of a pseudo-conversation about celebrity pictures. The participant and pseudo-confederate took turns describing each of the 15 celebrity images (*i.e.*, 10 statements per picture; 5 participant and 5 pseudo-confederate). Participants were informed to speak freely during his/her turn and the pseudo-confederate would initiate the conversation because she had been viewing the first picture longer. After each pseudo-confederate response, the participant received a visual and auditory prompt to indicate his/her turn. Each pseudo-confederate statement had a 2s delay before its presentation to imply she was thinking about the picture and how to respond. Once the first task was completed, the participant was asked a number of questions (see Measures section below).

During the second task, participants were asked to code their own comments as ironic (*i.e.*, anything said that was in opposition to the literal meaning), or not ironic (*i.e.*, anything said that was meant literally) to increase ecologically validity of rating their utterances. Irony consisted of, but was not limited to sarcasm, rhetorical questions, and/or a simile, while not irony examples included descriptions, non-sarcastic insults and/or agreement statements (Roberts & Kreuz, 1994). Crucially, at the time of coding, the participant utterances with the paired celebrity image were randomly presented to prevent order effects.

Measures. At the end of the first task, participants were asked if s/he: 1) perceived irony? (88.9% perceived), 2) produced irony? (92.5% produced), and 3) produced irony when their partner did? (74% aligned). Upon completion of task 1 and 2, the confederate and participant were reseated together for debriefing and asked: "Did you feel like you were speaking with this person?" (59.3% deceived).

The participant codes were subsequently evaluated revealing that the rating task was rather difficult for some participants. Therefore, an expert coder re-coded each participant response based on the definitions above (see Table 2 for kappa scores). The codes that differed between participant/expert rater were retained and randomly presented to a blind rater. The kappa scores were relatively low, but within a reasonable range of the maximum possible

kappa (Bakeman & Deckner, 2007). Thus, the raters were retrained on 10% of the existing disagreed upon statements. The expert and blind coder recoded the remaining statements separately. The raters together (for 100% agreement) determined the last 2% of the responses that did not induce agreement.

Table 2. Kappa, kappa max, and % kappa max between participant (P) x expert (E) and expert x blind (B) coder.

		κ	κ_{max}	% κ_{max}
Coder	P x E	0.6473	0.9477	68%
	E x B _{time1}	0.3905	0.4622	84.5%
	E x B _{time2}	0.7371	0.8817	83.5%

Results

The probability of ironic statements from the participant and expert/blind coder ratings was evaluated via a 3 (Condition: beginning, middle, or end) x 3 (Block: beginning, middle and end) mixed repeated measures fixed effects model with a CSH (compound symmetry heterogeneous) covariance structure. Post hoc adjusted bonferroni paired comparisons were used to evaluate any significant main effects and interactions.

Participant Ratings. The Type (3) test of fixed effects revealed a significant main effect for Block [$F(2, 27.720) = 16.288, p < .001$] and a Condition x Block interaction [$F(4, 27.720) = 4.667, p < .005$; see Figure 2]. The paired comparisons for the main effect of Block revealed that the highest probability of ironic statements occurred in the middle block relative to the beginning ($p < .001$) and end blocks ($p < .05$). There was a higher probability of irony judgments in the end block compared to the beginning ($p < .005$). The Condition x Block interaction revealed that the middle condition had a significantly higher probability of irony judgments in the middle block relative to the beginning ($p < .001$) and end blocks ($p < .05$). Similarly, the end condition received a higher probability of ironic statements in the end block than the beginning block ($p < .001$).

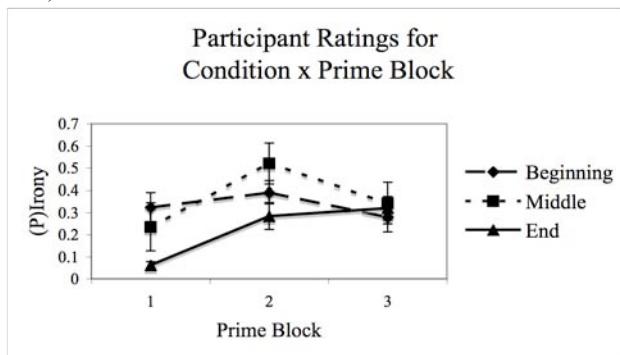


Figure 2. The probability of participant irony was highest for the blocks with the highest concentration of pseudo-confederate irony (2/3 irony) for the middle and end conditions.

Expert/blind coder. The Type (3) test of fixed effects revealed a significant main effect for Condition [$F(2, 10.814) = 4.894, p < .05$] and Block [$F(2, 30.987) = 12.296, p < .001$] with a Condition x Block interaction [$F(4, 30.987) = 7.040, p < .001$, see Figure 3]. Post hoc paired comparisons of ironic statements between conditions revealed a significantly higher probability of irony judgments in the beginning condition relative to the end condition ($p < .05$). Comparisons for block across all conditions revealed a higher probability of ironic statements in the middle blocks relative to the beginning ($p < .01$) and end blocks ($p < .05$). The Condition x Block interaction revealed that the beginning condition had a significantly higher probability of irony judgments in the beginning and middle blocks relative to the end block ($p < .05$). The middle condition received a higher probability of ironic statements in the middle block relative to the beginning ($p < .001$). Finally, the end condition received a higher probability of ironic statements in the end block than the beginning and middle blocks ($p < .005, p < .001$, respectively).

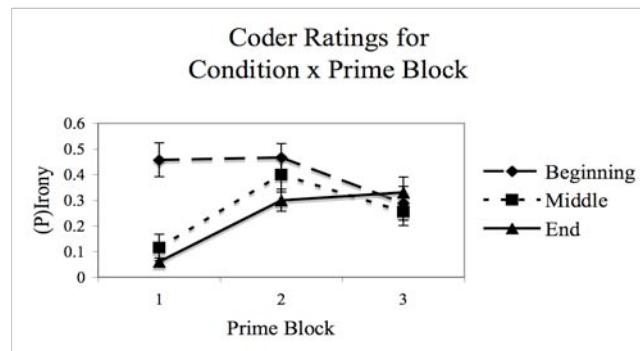


Figure 3. The probability of participant irony was highest for the blocks with the highest concentration of pseudo-confederate irony (2/3 irony) for all conditions.

Discussion. As seen in Figures 2 and 3, coders had a higher proportion of irony judgments than participants. This may have been due to difficulty some participants had in categorizing their own statements. This problem was addressed in Experiment 2, by providing more explicit descriptions of the categories. Regardless of the difference between coders, the overall trends in the data provided the same interpretation.

Experiment 1 provides evidence of pragmatic alignment in both the participant and coder ratings. The main effect of Condition (coder) suggests that alignment may have been stronger at the beginning of the conversation because the participant was primed early on in the conversation, which allowed them to employ the effect of the prime longer than

they could have in the end condition. The main effects for Block simply represent the overall higher percentage of ironic responses participants received during the middle of each conversation (*i.e.*, the means were not affected by lower probabilities as seen in the tails of the beginning and end conversation conditions). The effect of alignment is most evident in the Condition x Block interaction, where an increased probability of irony judgments occurred given a higher concentration of ironic primes from the pseudo-confederate.

Experiment 2

A similar theory of alignment has been proposed in the emotion literature. Emotional contagion and mood contagion involve shared emotion-related representations or states. Emotional cues could promote the convergence of other's emotions that may similarly simplify dialogue (Hsee, Hatfield, Carlson, & Chemtob, 1990; Hatfield, Cacioppo, & Rapson, 1993; Neumann & Strack, 2000; Bono & Ilies, 2006). An individual's mood may change depending on the emotional cues related to the valence their conversation partner's actions and language. Research in this domain has argued that emotional and mood contagion occurs if the individual automatically mimics and synchronizes with another person's behavioral emotion-related cues, thus converging with each other emotionally.

This theory is similar to Garrod and Pickering's (2004) position, in that we not only use linguistic information to make conversation easier, but may also allow speakers to decode pragmatic intent from the emotional cues interlocutors may produce. Indeed, the results from Experiment 1 may have simply been due to the alignment of an emotion-related cue: The valence (almost always humorous) of the ironic statements themselves. The purpose of Experiment 2 is to examine the influence of any such mood contagion on pragmatic alignment.

Method

Subjects. Participants included 16 University of Memphis undergraduate students (mean age = 20.25 years; 11 females). All participants reported having normal to corrected vision, and no reports of hearing or speech impairments.

Materials & Stimuli. Experiment 2 was identical to Experiment 1, with the exception of a 2.37min comedy clip¹ that was presented before the experimental session to induce a humorous mood. The clip was rated 6.8 on a 10-point Likert scale (1=not funny, 10 = extremely funny).

Procedure. Before the experimental conversation task began, the participant was asked to view a humorous video

clip while the confederate was being instructed about the task at hand in a different room.

During the second task, participants were again asked to code their own comments as ironic. Since this task was rather difficult for some participants in Experiment 1, examples of each sub-category were provided for both irony and not irony. This was done to increase the understanding of what each category truly meant (see Table 3 for the descriptions).

Table 3. Sub-category examples of irony [sarcasm, simile, rhetorical question (R?)] and not irony (description, non-sarcastic insult (Insult (NS), agreement) statements.

Type		Statement
	Sarcasm	"Nice Dress," if the dress was ugly.
Irony	Simile	She looks like a peacock.
	R?	What was she thinking?
	Description	She is wearing a dress.
Not Irony	Insult (NS)	She is ugly.
	Agreement	Yeah, I agree.

Measures. At the end of the first task, participants were asked if s/he: 1) perceived irony? (100% perceived), 2) produced irony? (93.75% produced), and 3) produced irony when their partner did? (81.25% aligned). Upon completion of both tasks, the confederate and participant were seated together for debriefing and asked: "Did you feel like you were speaking with this person?" (56.2% deceived).

Identical to Experiment 1, expert and blind coders re-coded each participant response based on the definitions above (see Table 4 for kappa, kappa max, and % kappa max).

Table 4. Obtained values of kappa, kappa max and % kappa max between participant (P) x expert (E) and expert x blind (B) coders.

		κ	κ_{max}	% κ_{max}
	P x E	0.7146	0.9229	77.4%
Coder	E x B _{time1}	0.2196	0.3237	68%
	E x B _{time2}	0.6787	0.8929	76%

Results

The 2 (Condition; beginning *or* end) x 3 (Block; beginning, middle, *and* end) analysis for Experiment 2 was identical to Experiment 1.

¹ The comedy clip used in Experiment 2 was a scene from a popular British comedy show ("Lauren in French Class" from *The Catherine Tate Show*) found on youtube.com. (<http://www.youtube.com/watch?v=zV1zK8zRCPo>).

Participant Ratings. The Type (3) test of fixed effects revealed a significant main effect for Block [$F(2, 24.299) = 4.796, p < .02$] and a Condition x Block interaction [$F(4, 24.299) = 15.987, p < .001$, see Figure 4]. Post hoc paired comparisons of Block revealed a higher probability of ironic statements in middle block than the beginning ($p < .05$). The Condition x Block interaction revealed that the beginning condition had a significantly higher probability of irony judgments for beginning and middle blocks relative to end block (both, $p < .05$). Similarly, the end condition received a higher probability of ironic statements for middle and end blocks than beginning block ($p < .005; p < .001$).

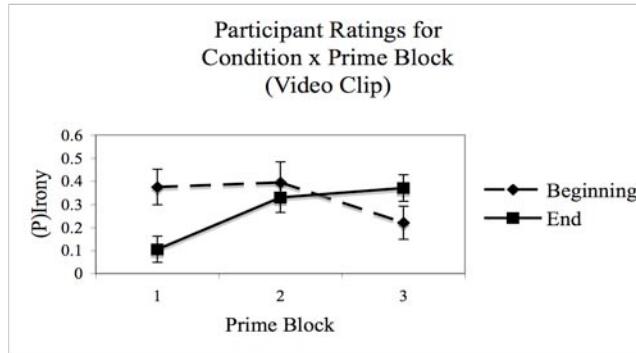


Figure 4. The probability of participant irony was highest for blocks with the highest concentration of pseudo-confederate irony (2/3) for beginning and end conditions.

Expert/blind coder. The Type (3) test of fixed effects revealed a significant main effect for Block [$F(2, 24.956) = 8.353, p < .005$] and a Condition x Block interaction [$F(4, 24.956) = 10.366, p < .001$, see Figure 5]. Post hoc paired comparisons of Block revealed a higher probability of ironic statements in middle block than the beginning ($p < .001$) and end blocks ($p = .05$). The Condition x Block interaction revealed that the beginning condition had a significantly higher probability of irony judgments for the middle blocks relative to end block ($p < .005$). Similarly, the end condition received a higher probability of ironic statements for middle and end blocks than beginning block ($p < .005; p < .001$).

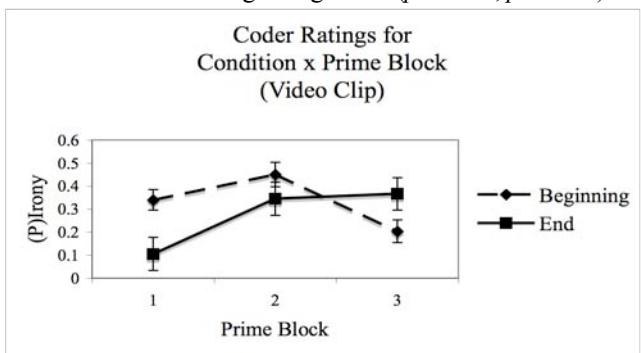


Figure 5. The probability of participant irony was highest for the blocks with the highest concentration of pseudo-confederate irony (2/3 irony) for the beginning and end conditions.

Discussion. The moderate humor ratings for the video clip, may have contributed to the non-significant effect of mood contagion. Experiment 2 directly replicated Experiment 1, with the exception of finding a main effect of Condition. This suggests that the initiation of irony in the beginning condition of Experiment 2 did not have as strong of an effect as it did in Experiment 1. The direct replication of Experiment 1 does suggest that regardless of the attempts to induce mood, there was clear evidence of ironic alignment at the pragmatic level. Participant and coder ratings were relatively similar (see Figures 4 and 5), suggesting a more detailed description of the subcategories was helpful. Overall, participants coordinated their pragmatics with the pseudo-confederate, and not simply in response to the video.

General Discussion

Experiments 1 and 2 revealed that interlocutors align at the pragmatic level. These findings are consistent with previous research evaluating interactive alignment at other linguistic levels (Garrod & Pickering, 2004). However, this effect is somewhat inconsistent with current pragmatics literature. For example, Dress, Kreuz, Link and Caucci, (2008) obtain results that many individuals refrain from using sarcasm in novel social situations because it has a strong negative connotation. Yet, if a speaker successfully implements a pragmatic goal during conversation, the listener is obligated to decode the speaker's intent resulting in, for example, accepted use of irony (Anolli, 2001; Sperber & Wilson, 2004). Via alignment, the probability of responding in a similar way should grow. The pragmatic goal implemented in these experiments allowed the participant to adopt the strategy of the pseudo-confederate. When participants were highly primed for these specific pragmatic goals, s/he was provided with a now acceptable strategy of responding.

If levels of alignment conflict, then listeners may seek to confirm a speaker's intent – indeed, pragmatic goals can and do fail in daily conversation. Nevertheless, the alignment model attempts to explain recovery from possible failures. During conversation, individuals may self-monitor in order to repair mistakes. If a listener does not comprehend intent, s/he will attempt to seek further information to better align (e.g., via clarification question; Pickering & Garrod, 2004). For example, if a statement is not perceived as ironic, and thus appears anomalous, a repair strategy can be enlisted to repair the inconsistency (e.g., seeking a possible pragmatic explanation for a literally false or unusual statement).

Such breakdowns relate directly to a limitation of the current study. For example, pragmatic alignment may have been hindered due to the artificial nature of the task. The conversation scenario was perceived as non-natural by some of the participants, but as expected, all participants interacted with the pseudo-confederate by using agreement statements or asking questions (e.g., responding “are you serious? or “yeah, I agree”; cf. Holtgraves, Ross, Waywadt, & Han, 2007). Also, upon further analysis, there were no significant differences in the probability of producing irony between the individuals who were deceived and not. It

should be considered that by asking questions and using agreement statements may very well be related to repair strategies.

Many participants suggested the artificiality of the conversation was caused by the pseudo-confederate's refusal to acknowledge his/her own comments. This may have also prevented the participant from implementing his/her own pragmatic goals, thus forcing the listener to adopt the pragmatic rule of the pseudo-confederate. This irregular way of interacting may have lead to moderate effects of alignment because the participant was prevented from dynamically implementing other conversation strategies. In a natural conversation setting, individuals can enlist other forms of pragmatics (e.g., humor, jokes).

Another limitation of this study was the way in which mood contagion was evaluated. There was no effect of contagion when mood was induced. However, there may have been some level of emotional alignment during the course of the pseudo-conversation. If the participants produced similar behavioral (e.g., acoustic) cues related to the emotional intent of the pseudo-confederate, emotional contagion may have in fact occurred. Mood could be evaluated before and after the experimental session to assess if overall mood changes during the course of the study. Therefore, further evaluation of mood may reveal interesting relations between emotional and pragmatic contagion.

The evidence presented in this paper suggests that in discourse, individuals may align pragmatically to promote interaction. Cues to pragmatic intent are likely embedded within the linguistic aspects of conversation (e.g., lexical alignment), but may also include mood-related cues. Researchers should consider the interaction among all these variables (e.g., linguistic, pragmatic, and behavioral cues together) occurring between interlocutors. For example, perlocutionary statements that evoke emotional cues may help explain pragmatics-processing mechanisms of dialogue (e.g., humor, innuendo, or arguments). Further such work would extend our understanding of coordination into the ecology of everyday interaction.

Acknowledgements

We thank graduate researchers Kristy Snyder-Tapp and Emily Mathis for all of their valuable input. We also thank undergraduate researchers Maria Rossini, Alexis Dennis, Michael Lauderdale, Kim Hooss for all their hard work and dedication to making this project successful.

References

Anolli, L. (2001). Humor and irony in interaction: From mode adoption to failure detection. In Anolli, L., Ciceri, R., & Rivera, G. (Eds). *Say not to say: New perspectives on miscommunication*. Amsterdam: IOS Press.

Bakeman, R. & Deckner, D. (2007). *Analysis of behavioral streams*. *Handbook of Research Methods in Developmental Psychology*. Oxford, UK: Blackwell Publishers.

Bavelas, J., Black, A., Lemery, C., Mullett, J. (1986). "I show how you feel": Motor mimicry as a communicative act. *Journal of Personality and Social Psychology*, 50(2), 322-329.

Bock, J. (1986). Meaning, sound, and syntax: Lexical priming in sentence production. *Journal of Experimental Psychology: Learning, Memory and Cognition*, 12, 575-586.

Bono, J. & Ilies, R. (2006). Charisma, positive emotions, and mood contagion. *The Leadership Quarterly*, 17, 317-334.

Brainard, D. (1997). The psychophysical toolbox. *Spatial Vision*, 10, 433-436.

Clark, H. H. (1975). Bridging. In R. C. Schank & B. L. Nash-Webber (Eds.), *Theoretical issues in natural language processing*. New York: Association for Computing Machinery.

Clark, H. H. (1992). *Arenas of language use*. Chicago: University of Chicago Press.

Dress, M., Kreuz, R., Link, K. & Caucci, G. (2008). Regional variation in the use of sarcasm. *Journal of Language and Social Psychology*, 27(1), 71-85.

Garrod, S. & Pickering, M. (2004). Why is conversation so easy? *Trends in Cognitive Science*, 8(1), 8-11.

Hancock, J. (2004). Verbal irony use in face-to-face and computer mediated conversations. *Journal of Language and Social Psychology*, 23(4), 447-463.

Hatfield, E., Cacioppo, J., & Rapson, R. (1994). *Emotional Contagion*. New York, NY: Cambridge University Press.

Holtgraves, T., Ross, S., Waywadt, C., & Han, T. (2007). Perceiving artificial social agents. *Computers in Human Behavior*, 23, 2163-2174.

Hsee, C., Hatfield, E., Carlson, J. & Chemtob, C. (1990). The effect of power on susceptibility to emotion contagion. *Cognition and Emotion*, 4(4), 327-340.

Neumann, R. & Strack, F. (2000). "Mood contagion": The automatic transfer of mood between persons. *Journal of Personality and Social Psychology*, 79(2), 211-223.

Pickering, M. & Garrod, S. (2004). Toward a mechanistic psychology of dialogue. *Behavioral and Brain Sciences*, 27, 169-226.

Potter, M. & Lombardi, L. (1990). Regeneration in the short-term recall of sentences. *Journal of Memory and Language*, 29, 633-654.

Roberts, R. & Kreuz, K. (1994). Why do people use figurative language? *Psychological Science*, 5, 159-163.

Schober, M. (1993). Spatial perspective taking in conversation. *Cognition*, 43, 1-24.

Sperber, D. & Wilson, D. (2004). Relevance Theory. In Ward, G. & Horn, L. (Eds). *Handbook of Pragmatics*. Oxford:Blackwell, 607-632.