

ACOUSTIC ANALYSES OF THE SARCASTIC TONE OF VOICE

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Introduction

- It has been suggested, that tone of voice can be used to cue listeners to speakers' sarcastic intents (Kreuz & Roberts 1995; Cutler, 1974).
- Recently, researchers have shown that there are specific acoustic parameters, (e.g., pitch, duration and amplitude) that are relevant when comprehending sarcasm (Bryant & Fox Tree, 2005; Rockwell, 2000).
- However, there have been some discrepancies in research findings. Rockwell (2000) found that sarcastic statements were louder than nonsarcastic statements, while Bryant and Fox Tree (2005) found the opposite.
- This project was designed to investigate the acoustic parameters important in the natural production of sarcasm.

Hypotheses

- We were interested in addressing these three hypotheses;
- Hypothesis 1:** The more common ground (Clark & Marshall, 1981) the interlocutors share, the more likely they will be sarcastic with each other.
- Hypothesis 2:** There will be within-subject differences between literal and sarcastic utterances with regard to acoustic parameters (e.g., pitch, amplitude, & duration).
- Hypothesis 3:** The sarcastic utterances will use interjections and extreme adjective-adverb collocations (Kreuz & Roberts, 1995).

Participants

- 24 pairs (12 friend and 12 stranger) were recruited from the Audiology and Psychology departments at the University of Memphis.
- Potential participants were told that this study was designed to investigate social interaction.

Procedure

- Participants were recorded in a conversational setting in the Social Interaction Lab while engaging in tasks designed to elicit natural sarcasm (see Materials).
- Common ground was manipulated to determine whether it affects the acoustic parameters.
- Naturally produced sarcastic utterances were compared to sincere/literal utterances containing the same linguistic content produced by the same speaker. This important control has not been attempted previously.

Social Interaction Lab at the School of Audiology and Speech Language Pathology



Materials

- Participants were given three tasks designed to elicit sarcasm in a natural way.
- Tasks were randomized between sessions and included commenting on badly-dressed celebrities (Hancock, 2004), creating a meal for a person that they hate (Coates, 1991) and discussing bad restaurant experiences.

"Prepare a meal for a person you hate" (Coates, 1991)



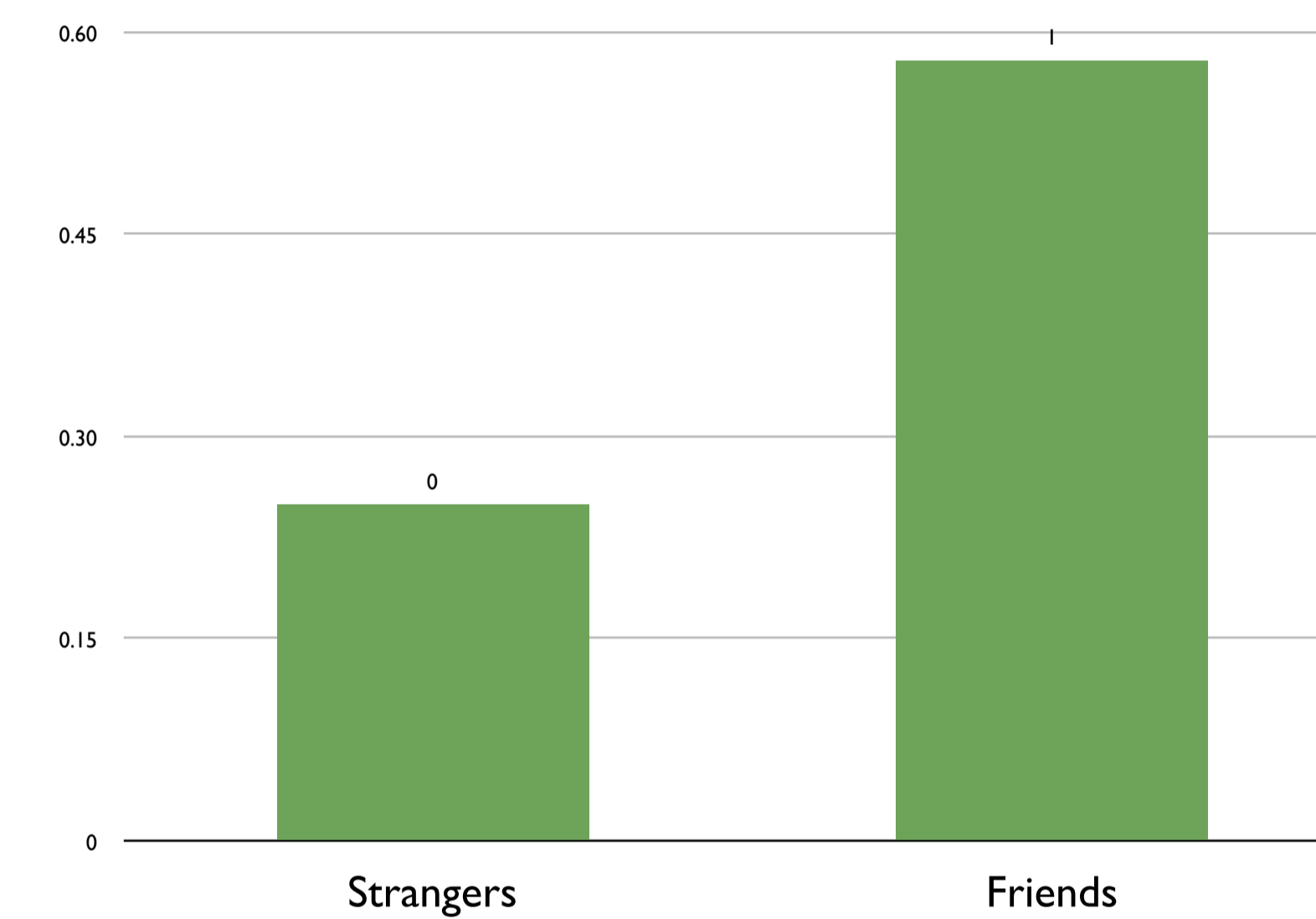
"Discuss with your partner the fashions you see"



Hypothesis 1: Common Ground

- There were 12 sessions of friend pairs, 7 of which contained at least one sarcastic utterance. Three of the 12 stranger-pair sessions included at least one sarcastic utterance.
- Results from Chi-Square revealed a significant difference between friend sessions and stranger sessions, $\chi^2(1, N = 24) = 2.74, p < .05$ (1 tailed).

PROPORTIONS OF SARCASTIC



Hypothesis 2: Acoustic Parameters

Length of Utterance

- Duration of sarcastic and nonsarcastic utterances differed significantly, $t = 2.57(28), p = .02$.
- Sarcastic utterances were longer than nonsarcastic utterances.

Length of Utterance

	SARCASTIC	NONSARCASTIC
MEAN	1260 ms	915 ms
SD	973	488

Pitch

- Utterances did not differ significantly with regard to mean fundamental frequency, $t = 1.67(28), p > .05$.
- However, we expect to find differences at the word level rather than at this global level.
- Further tests of this manipulation are being conducted.

Mean F0

	SARCASTIC	NONSARCASTIC
MEAN	157 Hz	172 Hz
SD	56	66

Amplitude

- There was a significant difference between utterances with regard to mean amplitude, $t = 3.56(28), p = .001$.
- Nonsarcastic utterances were louder on average than sarcastic utterances.

Mean AMP

	SARCASTIC	NONSARCASTIC
MEAN	0.079 V	0.136 V
SD	0.072	0.135
$t = 3.56(28), p = .001$		

Hypothesis 3: Lexical Sarcasm

- There were a total of 29 utterances. Fourteen of these included at least one interjection (e.g., oh, uh, um, etc.) or an adjective-adverb collocation.
- Examples of participants' utterances include:
 - "That's just awesome"
 - "Uh, yeah"
 - "Oh, that's very nice"
 - "lovely, pink, uh, satin dress"
- Analyses of these differences are currently underway.

Discussion

- Importantly, all sarcastic utterances in our data set were elicited naturally.
- We were able to show that common ground affects the amount of sarcasm participants produce. In other words, friends are more sarcastic with other friends than with strangers.
- Also, we showed that there are differences in acoustic parameters (duration, amplitude) when sarcasm is compared to nonsarcastic.
- We included important controls (baseline) and manipulations (common ground) that have not been attempted before in this context.
- We attempted to address the discrepancies in earlier research with regard to sarcastic versus nonsarcastic utterance duration. While it appears that our results support Rockwell's findings, methodological differences are too numerous to make direct comparisons.
- More analyses are currently underway to study the sarcastic tone of voice with regard to common ground and also at the local level (e.g., words, syllables).

References

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