Eye Tracking Evidence on Nonliteral Language Processing

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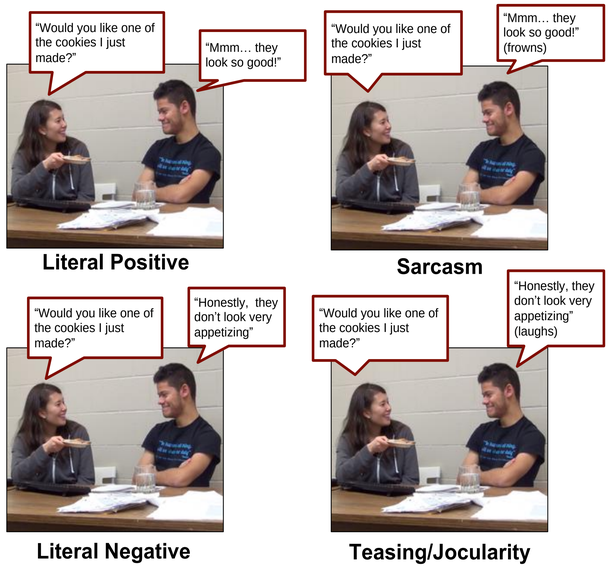
Introduction

- Nonliteral language, such as sarcasm, occurs frequently in daily life and can be a problem for many clinical populations due to its complexity
- Recognizing sarcasm and jocularity requires the integration of verbal, paralinguistic and nonverbal cues, yet most previous research on nonliteral language processing has been carried out using written or static stimuli
- Therefore, we conducted an eye tracking study to evaluate the processing of literal and nonliteral intentions using videos of dyadic interactions (RISC video database; Rothermich & Pell, 2015)

Research Aim

- Understand the processing of social interactions that include either literal or nonliteral exchanges.

Stimuli



192 Videos taken from the RISC database

Methods and Procedure

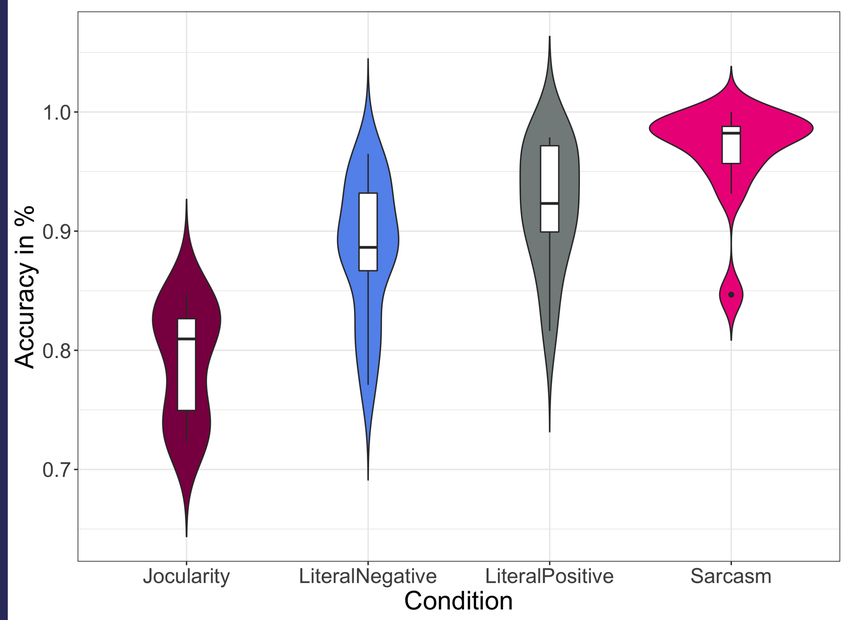
Participants: Native English speakers, *N*=37, (24 female, 13 male, mean age = 18.89 years, SD = 1.05 years).

Eye Tracker: Eyelink 1000 Plus eye-tracker (SR Research, Ltd., Ontario, Canada), sample rate: 500 Hz

Regions of interest: Faces of actors

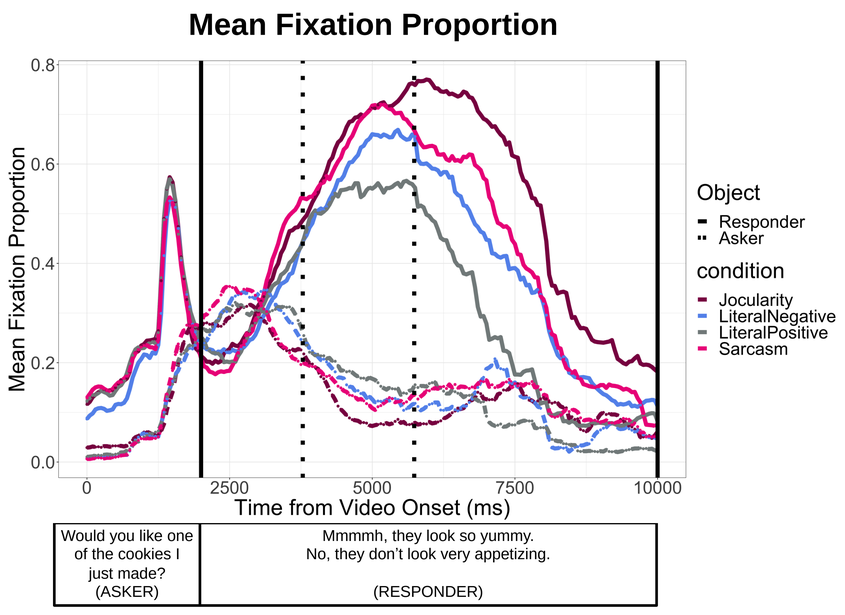
Task: yes/no question ("Was the response sincere?")

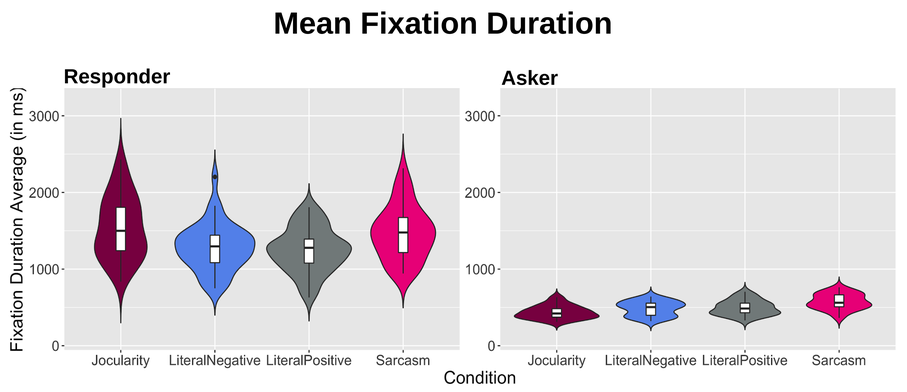
Behavioral Results



- Participants were most accurate at identifying SARCASM, followed by LITERAL POSITIVE intentions, and LITERAL NEGATIVE intentions
- Participants were least accurate at identifying JOCULARITY.
- Intention had a main effect in the accuracy model: SARCASTIC, LITERAL NEGATIVE, LITERAL POSITIVE were more accurate compared to JOCULARITY

Eye Tracking Results





Summary and Conclusion

- JOCULARITY received more fixations compared to LITERAL NEGATIVE, LITERAL POSITIVE, and SARCASM
- The responder in the video received significantly more fixations, and fixated longer, when compared to the asker
- JOCULARITY received the longest fixation compared to LITERAL POSITIVE, followed by LITERAL NEGATIVE.
- Our analysis revealed that participants more easily identified nonliteral language as compared to literal language, given cues used to signal sarcastic intentions.

Davis, M. H. (1980). A multidimensional approach to individual differences in empathy; 2009; 47:2005–15; Rankin KP, Salazar A, Gorno-Tempini ML, Sollberger M, Wilson SM, Pavlic D, et al. Detecting sarcasm from paralinguistic cues: anatomic and cognitive correlates in neurodegenerative disease. Neuroimage. Elsevier Inc.; 2009; 47:2005–15; Pell, MD & Rothermich K, (2015) Introducing RISC: A New Video Inventory for Testing Social Perception. PLoS ONE 10(7): e0133902. doi:10.1371/journal.pone.0133902.