



YCU Language and Multimodality

Integrating multimodal cues to resolve ambiguities in plural predication with quantifiers (joint work with Alexandra Lorson, University of Groningen)

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Abstract

Co-speech gesture was found to play a role in language comprehension (e.g., Nicol & Patson, 2022). For example, gestures highlighting aspects of concepts like time or size aid in resolving ambiguity (e.g., Winter & Duffy, 2020) and imprecision (Lorson et al., 2024). More specifically, Lorson et al. (2024) found that gestures indicating a large as opposed to small size can prompt comprehenders to infer higher numbers when co-occurring with the imprecise quantifier *several*. This talk presents a new piece of work that investigates the role of co-speech gesture in language comprehension. Sentences given in (1) exemplifies plural predication, which construe a situation in which children eat one single pizza together (collective reading) or one in which individual children eat one pizza each (distributive reading).

{Several / Some} children ate a pizza.

The previous studies suggest that comprehenders are generally biased toward collective readings (e.g., Gil, 1982; Frazier et al., 1999; Dotlačil & Brasoveanu, 2021), suggesting that distributive interpretations may require additional processing. I report the current result of an on-going project which builds on these findings by exploring the role of multimodal cues (linguistic/gestural) when comprehenders resolve ambiguities in sentences like (1).

Selected References

- Dotlačil, J., & Brasoveanu, A. (2021). The representation and processing of distributivity and collectivity: ambiguity vs. underspecification. *Glossa: A journal of general Linguistics*, 6 (1).
- Lorson, A., Silva, V. M., Hart, C., & Winter, B. (2024). Gesture size affects numerical estimates in quantifier comprehension. *Journal of Experimental Psychology: Learning, Memory, and Cognition*. doi:<https://doi.org/10.1037/xlm0001372>

Bio

I am currently working as a postdoctoral researcher at Leibniz-Zentrum Allgemeine Sprachwissenschaft (ZAS) under Alexander von Humboldt Research Fellow with my project "Projection of Pronominal Plurality Inferences (PoPPIn)." I am mainly working the tradition of formal semantics/pragmatics, which approaches to logical underpinnings of linguistic meanings and communication. I am particularly interested in inferential properties of utterances that contain quantifiers and plurals.

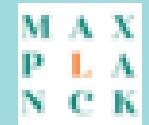
Before this, I was a postdoctoral researcher at the Institute for Logic, Language and Computation with the NWO funded project "A Sentence Uttered Makes a World Appear---Natural Language Interpretation as Abductive Model Generation" and obtained PhD in Linguistics at the University of Edinburgh.



Artificial Interlocutors in Psycholinguistics:
Using Robots and Avatars to Probe
Multimodal Language Understanding

Dr Chinmaya Mishra

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Abstract

Artificial agents such as social robots and virtual agents are increasingly used in psycholinguistics as experimentally controllable interlocutors for studying how humans comprehend and coordinate language in face-to-face conversation. Compared with human actors, agents enable fine-grained, replicable manipulation of multimodal cues central to interaction such as gaze, facial expressions, gestures, timing of feedback, and micro-behaviours that are difficult to enact consistently (e.g., blink timing). This controllability facilitates tests of how specific verbal and non-verbal signals contribute to face-to-face communication.

In this talk I will highlight three case studies. Listeners exploit an avatar's co-speech hand gestures to predict upcoming meaning, revealing a predictive mechanism through which gesture facilitates language processing (ter Bekke, Drijvers, & Holler, 2025). Systematic combinations of avatar facial signals influence perceived communicative intentions, supporting compositional contributions of facial cues to multimodal meaning (Trujillo & Holler, 2024). In social robotics, manipulating a robot's gaze-aversion strategy modulates humans' gaze aversion during dialogue, demonstrating reciprocal coupling between partner gaze behaviour and interaction dynamics (Mishra et al., 2023). Together, these examples show how artificial agents can isolate the multimodal mechanisms that support language in interaction.

References

- Mishra, C., Offrede, T., Fuchs, S., Mooshammer, C., & Skantze, G. (2023). Does a robot's gaze aversion affect human gaze aversion? *Frontiers in Robotics and AI*, 10, 1127626. <https://doi.org/10.3389/frobt.2023.1127626>
- ter Bekke, M., Drijvers, L., & Holler, J. (2025). Co-speech hand gestures are used to predict upcoming meaning. *Psychological Science*, 36(4), 237-248. <https://doi.org/10.1177/09567976251331041>
- Trujillo, J. P., & Holler, J. (2024). Conversational facial signals combine into compositional meanings that change the interpretation of speaker intentions. *Scientific Reports*, 14, 2286. <https://doi.org/10.1038/s41598-024-52589-0>

Bio

I am a Postdoctoral Researcher in the [Multimodal Language Department](#) at the Max Planck Institute for Psycholinguistics. I make use of artificial agents such as social robots and virtual avatars to study how we use multimodal language in face-to-face communication and how these agents can learn to behave in more human-like manner. My research uses an interdisciplinary approach by combining insights from psychology, psycholinguistics, artificial intelligence, and cognitive science in finding novel solutions to model/ automate robot behaviors that are needed to facilitate a seamless Human-robot Interactions (HRI). The broader goal that I pursue through my research is to make robots easier to be integrated into our society which enable us to be more efficient and comfortable.

Before joining MLD, I concluded my PhD research at [Furhat Robotics](#) as a Marie Curie PhD Fellow (Project: [Conversational Brains](#)), where I investigated ways to automate the gaze and affective behaviors of Social Robots and gauge the influence of these robot behaviors on HRI.



16:10-17:40
Wed, 21st
January, 2026

Zoom Link

