

# From Hands to Brains: How Does Human Body Talk, Think and Interact in Face-to-Face Language Use?

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## ABSTRACT

Most research on language has focused on spoken and written language only. However when we use language in face-to-face interactions we use not only speech but also use our bodily actions, such as hand gestures in meaningful ways to communicate our messages and in ways closely linked to the spoken aspects of our language. For example we can enhance or complement our speech with a drinking gesture, a so-called an iconic gesture, as we say “we stayed up late last night”. In this talk I will summarize research that investigates how such meaningful bodily actions are recruited in using language as a dynamic adaptive and flexible system and how gestures interact with speech during production and comprehension of language at the behavioral, cognitive, and neural levels.

First part of the lecture will focus on how gestures are linked to the language production system even though they have a very different representational format (i.e., iconic and analogue) than speech (arbitrary, discrete and categorical) [1] and how they express communicative intentions during language use [2]. In doing so I will show different ways gestures are linked to speech in different languages and in different communicative contexts as well as in bilinguals and language learners. Second part of the talk will focus on how gestures influence and enhance language comprehension by reducing the ambiguity of the communicative signal [3] and providing kinematic cues to the communicative intentions of the speaker [4] and the underlying neural correlates of gesture that facilitates its role in language comprehension [5]. In the final part of the talk I will show how gestures facilitate mutual understanding, that is alignment between interactants in dialogue. Overall I will claim that a complete understanding of the role language plays in our cognition and communication is not possible without having a multimodal approach.

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## CCS Concepts:

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## 1 BIOGRAPHY

Prof. Dr. Asli Ozyurek is a Professor at the Faculty of Humanities at Radboud University Nijmegen and a Principle Investigator and Board Member at Donders Institute for Brain, Behavior and Cognition and at the Max Planck Institute for Psycholinguistics . She is the



Director of the Multimodal Language and Cognition lab.

Ozyurek completed her BA in Psychology at Bogazici University in Istanbul Turkey and earned a double PhD degree in Psychology and Linguistics from University of Chicago. She has received many career grants such as ERC Starting Grant, Dutch Science foundation VIDI and VICI grants, hosted many Marie Curie Individual Fellowships . She is an elected member of Academia Europea and has received an ASPASIA award from Dutch Science Foundation and Young Scientist award from Turkish Science Foundation. She has publications in Science, PNAS, Cognition, Psychological Science, J of Cognitive Neuroscience, Neuroimage, Cerebral Cortex among others.

Her research focuses on the role language plays, as a dynamic, adaptive and flexible system, in human cognition and communication. To do so she uses a crosslinguistic and multimodal approach and investigates the neural, cognitive and social foundations of how language is used in embodied and situated contexts through our bodily actions as in the use of gestures used during speaking by hearing communities and sign languages used by deaf communities.

## REFERENCES

- [1] Özyürek, A. (2017). Role of gesture in language processing: Towards a unified account for production and comprehension. In G. Gaskell, & S. A. Rachemeyer (Eds.), *Handbook of Psycholinguistics*. (pp. 39-58). Oxford: Oxford University Press.

- [2] Campisi, E., & Özyürek, A. (2013). Iconicity as a communicative strategy: Recipient design in multimodal demonstrations for adults and children. *Journal of Pragmatics*, 47, 14-27
- [3] Drijvers, L., & Özyürek, A (2017). Visual context enhanced: The joint contribution of iconic gestures and visible speech to degraded speech comprehension. *Journal of Speech, Language, and Hearing Research*. 60, 212-222
- [4] Trujillo, J. P., Simanova, I., Özyürek, A & Bekkering, H. (2020). Seeing the unexpected: How brains read communicative intent through kinematics. *Cerebral Cortex*, 30(3), 1056-1067.
- [5] Özyürek, A. (2014). Hearing and seeing meaning in speech and gesture: Insights from brain and behaviour. *Philosophical Transactions of the Royal Society of London. Series B, Biological Sciences*, 369(1651)