

# Gestures speed up responses to questions

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Most language use occurs in face-to-face conversation, which involves rapid turn-taking. Seeing communicative bodily signals in addition to hearing speech may facilitate such rapid turn-taking (Holler & Levinson, 2019). We tested whether this holds for co-speech hand gestures by investigating whether these gestures speed up responses to questions. While correlational corpus data showed that questions with hand gestures got faster responses than questions without (Holler et al., 2018; ter Bekke et al., 2020), experimental studies provided more mixed evidence on whether participants respond faster to stimuli containing speech and gesture (e.g., He et al., 2015; Krason et al., 2021). We brought these findings together, by experimentally testing whether gestures speed up responses in a question-response task. Participants viewed videos in which an actress asked yes/no-questions, either with or without a corresponding iconic hand gesture (Fig. 1). They answered the questions as quickly and accurately as possible via a button press. Results showed that gestures speed up responses to questions (Fig. 2), in line with the idea that multimodality may facilitate rapid turn-taking during face-to-face conversation.

**Index Terms:** multimodal language; hand gestures; turn-taking; response times; facilitation

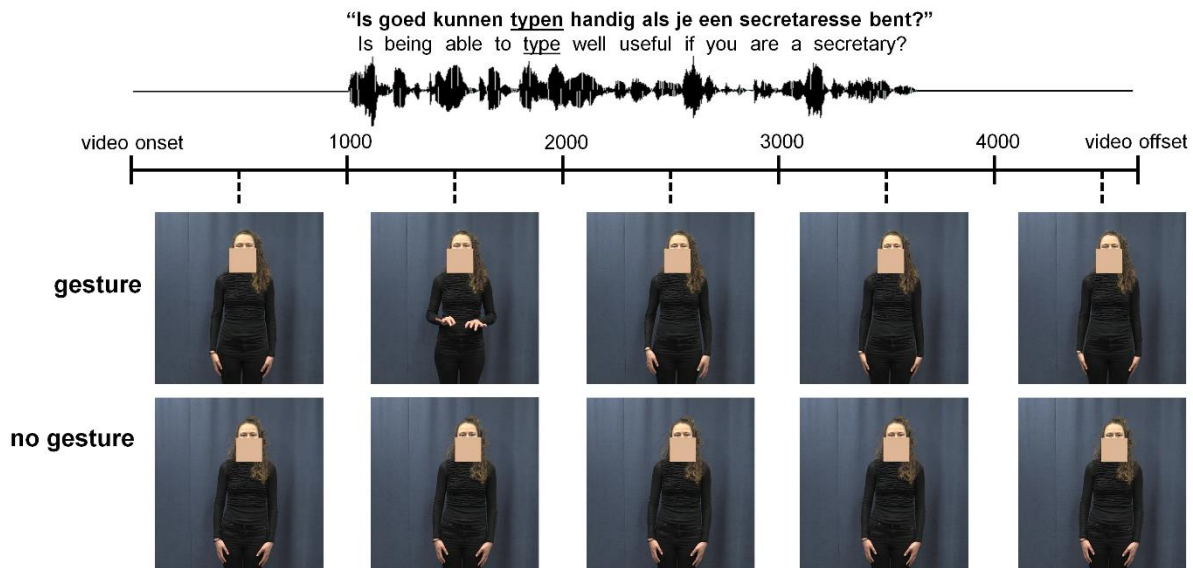


Figure 1: Schematic stimulus overview. Videos started 1000 ms before question onset and ended 1000 ms after question offset. The actress was instructed to utter each question as she normally would in conversation. For each question item in the Gesture condition, she was asked to produce a gesture depicting the lexical affiliate (i.e. the word in the question corresponding to the gesture) in a way that felt natural. In the No gesture condition, she stood still. A skin-coloured square was overlaid onto the video stimuli to cover visual speech movements from the face and throat. The exact same audio was used in both conditions.

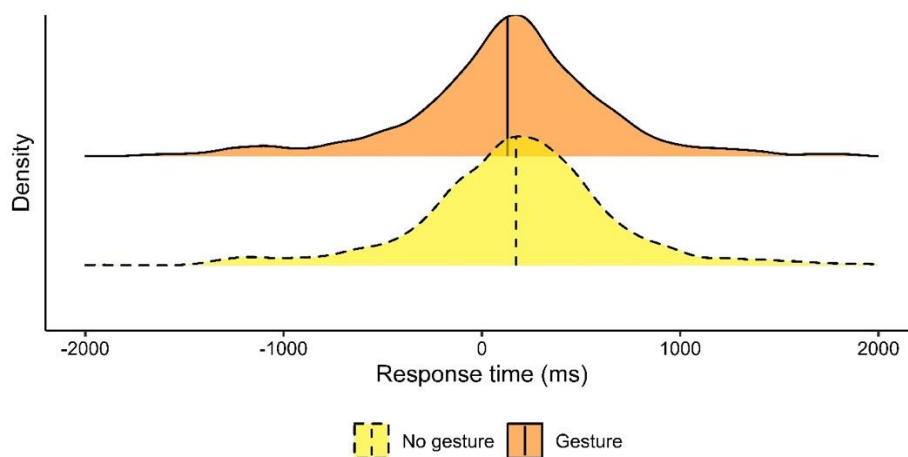


Figure 2: Questions with gestures got faster responses than the same questions without gestures. The distribution of reaction times per condition is shown. Vertical lines display mean reaction times.

## References

- He, Y., Gebhardt, H., Steines, M., Sammer, G., Kircher, T., Nagels, A., & Straube, B. (2015). The EEG and fMRI signatures of neural integration: An investigation of meaningful gestures and corresponding speech. *Neuropsychologia*, 72, 27–42. <https://doi.org/10.1016/j.neuropsychologia.2015.04.018>
- Holler, J., Kendrick, K. H., & Levinson, S. C. (2018). Processing language in face-to-face conversation: Questions with gestures get faster responses. *Psychonomic Bulletin and Review*, 25(5), 1900–1908. <https://doi.org/10.3758/s13423-017-1363-z>
- Holler, J., & Levinson, S. C. (2019). Multimodal language processing in human communication. *Trends in Cognitive Sciences*, 23(8), 639–652. <https://doi.org/10.1016/j.tics.2019.05.006>
- Krason, A., Fenton, R., Varley, R., & Vigliocco, G. (2021). The role of iconic gestures and mouth movements in face-to-face communication. *Psychonomic Bulletin & Review*, 29, 600–612. <https://doi.org/10.3758/s13423-021-02009-5>
- ter Bekke, M., Drijvers, L., & Holler, J. (2020). The predictive potential of hand gestures during conversation: An investigation of the timing of gestures in relation to speech. *PsyArXiv*. <https://doi.org/10.31234/osf.io/b5zq7>