

Self-monitoring in Speech Production

Symposium proposal ESCOP2017

The monitoring of one's own speech is emerging as a key topic within the psychology of language. But it also reaches outside the study of language processing and relates to several key interests in psychology in general, such as sense of agency-processing, metacognition, and general action monitoring. Lately, three major proposals for how monitoring during speech proceeds have generated much discussed high-impact publications. They differ on several characteristics, such as the processes involved, the mechanisms for detection and their neural basis. First, according to conflict monitoring models (Nozari et al., 2011; Gauvin et al., 2016), errors are detected as conflict in the production process itself. Here, monitoring does not depend on external perception such as auditory or proprioceptive feedback. Second, forward modelling proposals take their architecture from models of general action monitoring and suggest that prediction is the key process behind speech monitoring. Here, incoming auditory feedback is compared with the prediction, allowing for the detection of errors (Pickering & Garrod, 2013). Third, in attempting to integrate psycholinguistic models of speech production and monitoring with models of speech motor control, the Hierarchical State Feedback Control model seeks to provide a neurocomputational architecture for speech and self-monitoring. It uses both internal forward prediction for somatosensory targets and external perceptual auditory feedback (Hickok, 2012; 2014). The goal of this symposium is to bring together the main proponents of these three theories to present theoretical and empirical evidence for the different models. This will be followed by a panel discussion which will attempt to elucidate the conflicts and common ground of the proposals. The discussion will be moderated by Rob Hartsuiker and Andreas Lind. Hartsuiker's work on speech production and self-monitoring spans more than two decades and include key publications such as Hartsuiker & Kolk (2001) and Huettig and Hartsuiker (2010). Lind et al. (2014) recently developed a new tool for manipulating auditory feedback in real-time and found that speakers sometimes believe they said the thing they in fact only heard, suggesting an interpretive role for auditory feedback.

Program

Four 20 minute talks

Gregory Hickok, *University of California, Irvine:*

“Towards an integrated psycholinguistic, neurolinguistic, sensorimotor framework for speech production”

Martin Pickering, *The University of Edinburgh:*

“Joint monitoring in dialogue”

Nazbanou Nozari, *Johns Hopkins University:*

“Production-based monitoring and control”

Hanna Gauvin, *Queensland University of*

Technology: “Functional brain mapping of verbal self-monitoring”

Discussion 20 minutes

References

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- Hickok, G. Computational neuroanatomy of speech production. *Nature Reviews Neuroscience*, *13*, 135-145.
- Hickok, G. (2014). The architecture of speech production and the role of the phoneme in speech Processing. *Language, Cognition and Neuroscience*, *29*, 2-20.
- Huettig, F. & Hartsuiker, R. J. (2010). Listening to yourself is like listening to others: External, but not internal, verbal self-monitoring is based on speech perception. *Language and Cognitive Processes*, *25*, 347-374.
- Lind, A., Hall, L., Breidegard, B., Balkenius, C., & Johansson, P. (2014). Speakers' acceptance of real-time speech exchange indicates that we use auditory feedback to specify the meaning of what we say. *Psychological Science*, *25*, 1198-1205.
- Nozari, N., Dell, G. S., & Schwartz, M. F. (2011). Is comprehension necessary for error detection? A conflict-based account of monitoring in speech production. *Cognitive Psychology*, *63*, 1-33.
- Pickering, M. J. & Garrod, S. (2013). An integrated theory of language production and comprehension. *Behavioral and Brain Sciences*, *36*, 329-392.

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