THE LANGUAGE CIRCLE

MPI FOR HUMAN COGNITIVE AND BRAIN SCIENCES, STEPHANSTRASSE 1A, LEIPZIG

08.05.2024, 15:00 CEST

Zoom: https://zoom.us/j/94686183586

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Neural entrainment as a measure and a mechanism of statistical language learning

Statistical learning is the process of becoming sensitive to statistical regularities in the environment and is thought to play a critical role in many aspects of language learning. Many past studies of statistical learning have focused on learners' ability to make explicit recognition judgments about learned items after the learning process. However, this ability represents just one limited—and often absent—outcome of statistical learning. In this talk, I will present a line of work that leverages neural entrainment to better understand the process of statistical learning as it unfolds over time. Across multiple EEG studies, we have found rapid, robust neural entrainment to hidden words in speech, which persists across different experimental manipulations. In another study, we actively manipulated neural entrainment during learning and found that boosting neural entrainment at the relevant frequency enhances subsequent statistical learning performance. These results suggest that entrainment not only reflects, but also actively supports statistical learning. Recent intracranial data is allowing us to unveil the specific brain regions where this process takes place. Taken together, our results suggest that neural entrainment may reflect a "core", robust, potentially near-obligatory mechanism for pattern detection in the brain. This core mechanism may optionally—not always—trigger a secondary set of long-term memory mechanisms allowing for the flexible expression of knowledge.

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