LANGUAGE CYCLES
MAX PLANCK RESEARCH GROUP

Wednesday, 10 May 2023, 13:00 (CET)

Wilhelm-Wundt-Room

Language Circle

Dr. Keith Doelling

Institut Pasteur, Paris, France

Oscillations as hard-coded rhythmic priors and prediction errors in time

Understanding brain function requires explanation at multiple levels. From one perspective, the perceptual system requires the mapping of external dynamics, statistics of our environment, to the internal processes of our neural architecture. From another, it requires the transformation of physical stimuli into representations of objects and concepts that can be operated on in abstract thinking. My work aims at bridging these levels of dynamics and cognition in a context that is shared between the two of them: time perception. I have focused on the temporal dynamics of sequence processing in speech, music and rhythmic sequences, finding (using M/EEG) that their temporal features are encoded with support from neural oscillations which synchronize to the regular temporal statistics of these stimuli. More recently, my work has focused on the implications of such a mechanism for real-world sequences where stimuli are rarely perfectly rhythmic. I will present research that shows how this framework can be applied to sequences with more irregular statistics. Through a combination of behavioral research, intracranial data, and comparative computational modeling approach I propose that oscillatory synchronization can be considered as the instantiation of a rhythmic prior, biasing perception towards rhythmic sequences when temporal measurements are uncertain and as a read out of errors from this expectation. Together, my research supports the hypothesis that the presence of neural oscillators in neural architecture in auditory cortex may represent a hard-coded mechanism for the expectation of rhythmicity in our environment.

Join online:

https://zoom.us/j/95065830000
Meeting-ID: 950 6583 0000

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For more information, please contact Caroline Duchow: duchow@cbs.mpg.de