Spring 2018

Entraining Neural Oscillations: Altering Auditory Perception with Amplitude Modulated Stimuli

Hayley Clocksin
Washington University in St. Louis

Entraining Neural Oscillations: Altering Auditory Perception with Amplitude Modulated Stimuli

Hayley Clocksin

Mentor: Jonathan Peelle

Current research suggests that our ability to understand rapid and complex acoustic information such as speech stems in part from the entrainment of local neuron populations to the incoming stimuli. The ability to register and match the phase of neural oscillations to that of incoming information is thought to aid in predicting when salient information will be present in the environment and ensuring that the synchronized neural populations will be primed to respond. While past research has shown that external auditory stimuli have the ability to entrain neural populations, few studies have explored the extent to which this external modulation influences performance on auditory tasks. The goal of this study was to characterize the degree to which auditory entrainment affect perception of near-threshold stimuli. Following brief entrainment to a 3-hertz amplitude modulated auditory noise, participants detected 1 kilohertz tones near threshold spread evenly within the first cycle of the 3-hertz phase angle. While participants' ability to detect tones near threshold was differentiated by the phase of the modulation, the effects did not follow the smooth sine curve of the modulation as expected. Rather, it appears that the connection between neural entrainment and behavior is more clouded than suggested by the existing literature and that future studies should explore potentially intermediary neural correlates.