

FREQUENCY TAGGING OF PERIODIC METRONOME PRESENTS THE MOST PROMINENT PEAK CORTICAL FREQUENCY AS COMPARED TO VARIABLE METRONOMES

Ryan L. Meidinger, Vivien Marmelat

Neural activity exhibits non-periodic rhythm [2] but it is unknown if neural activity synchronizes with non-periodic rhythms, as it does with periodic rhythms [1]. The purpose of this research is to determine the neural mechanisms present leading to synchronized finger tapping to varying rhythms. Twenty healthy young adults tapped their finger on a pressure sensitive pad, listened to metronomes, and wore an electroencephalogram (EEG) during synchronized finger tapping tasks (periodic, fractal, and random). Inter-tap intervals (ITIs), inter-beat intervals (IBIs), and frequency tags were used as the behavioral and cortical synchronization with the metronome. One-way ANOVAs were used to determine differences between the peak cortical frequencies present during synchronization and the frequency of the metronome. The periodic rhythm stimulated the most prominent peak in most participants. Mean frequency of the fractal and periodic metronomes were similar between brain activity and the metronome for the Oz electrode. The peak frequencies in the fractal and random conditions are difficult to identify in all participants and is requiring more detailed identification processes. The identification of these frequencies will be based on the identification of the peak frequencies present from the metronome and the distribution of amplitudes at those frequencies, as they are expected to be present in cortical recordings. The results of this work support evidence that brain activity synchronizes with periodic metronomes and may with variable metronomes to a lesser magnitude, as the stimulus is less strong at a single frequency.

REFERENCES

1. Ross, J. M., & Balasubramaniam, R. *Frontiers in Human Neuroscience*, 2014.
2. Delignières, D., et al. *Experimental Brain Research*, 234, 2773-2785, 2016.