Dávid György (University of Geneva): Rhythmic priming of syntactic processing: a common structure?

Recent empirical evidence has shown several correlations between language and musical rhythm processing in typical and atypical populations (Corriveau & Goswami, 2009; Friederici et al., 2003; Gordon et al., 2015a). One line of studies has reported improved syntactic processing following exposure to a rhythmically regular musical prime compared to an irregular musical prime, environmental noise, or silence (Bedoin et al., 2016; Canette et al., 2020, Chern et al., 2018; Przybylski et al., 2013). However, it cannot be ruled out that part of this rhythmic priming effects lies in a disruption from the irregular rhythm rather than a pure facilitatory effect of the regular rhythm as, to our knowledge, no studies have compared an irregular prime with a baseline condition. The present study aimed to directly compare the effects of regular and irregular primes as well as a silent baseline on syntactic processing. In two experiments, French-speaking typical adults underwent rhythmic priming and completed a grammaticality judgement task in a semi-artificial Jabberwocky language. In both experiments, results showed that rhythmic priming can influence syntactic processing, though only in the first three sentences after a prime rather than six sentences as usually reported for natural language stimuli. Experiment 1 showed a disadvantage of the irregular condition compared to the regular and silence conditions. However, the block design of this experiment may have confounded our findings. Experiment 2 sought to remedy this by using a mixed design. Results showed higher grammaticality judgement accuracy in the regular than in the irregular condition, with a marginal advantage of regular over silence. Furthermore, grammaticality judgement accuracy correlated with performance in a rhythm discrimination task, while participants' ability to anticipate a metronome beat showed a relationship with the number of languages they spoke. These findings are discussed in the frameworks of Dynamic Attending (Large & Jones, 1999) and hierarchical structure building in musical rhythm and language processing (Fitch & Martins, 2014; Heard & Lee, 2019).