

B.4: Music disrupts pressure force more than speech during sensorimotor synchronization

Anita Bialunska & Simone Dalla Bella (University of Finance and Management, Warsaw, Poland)

anita.bialunska@vizja.pl

The coordination of movement with rhythmic stimuli (e.g., music during dance) is a universal human skill. Still, not all rhythmical auditory stimuli are equally tied to motion. For example, people often move in synchrony with musical beats whereas synchronization of movement with speech accents is rare. This intuition received support in a recent study (Bialunska & Dalla Bella, submitted) in which we asked non-musicians to tap their index finger in synchrony with an isochronous auditory sequence (i.e., metronome) while music or speech distractors were presented. We found that musical distractors attracted movement more strongly than speech distractors. In the present study we examined whether similar findings can be replicated with a different task in which participants synchronized with the metronome by changing fingers' pressure force instead of performing a classical tapping task. Twenty-eight non-musicians were asked to produce short-duration force pulses with their index finger on a force transducer along with an isochronous auditory target sequence (i.e., tones with 600 ms IOI) while a distractor was presented, namely music or speech. Musical distractors were 3 excerpts from highly familiar musical pieces (i.e., Circus music, Sleighride, Bee Gees' *Stayin' Alive*). Speech distractors were 3 well-known excerpts from Polish children poetry read by an actor instructed to synchronize speech accents with an external metronome (IOI = 600 ms). The distractors were presented at one of various phase relationships with respect to the target. The accuracy of synchronization between pressure force trajectories and the target sequence, as revealed by anisynchrony, the time of occurrence of the maximum pressure force, and their variability, was more affected by music than by speech distractors. The effect of the distractors was larger when distractors preceded the target tones than when they followed them. In sum, there is converging evidence that musical rhythms attract movement more than stress structure in speech. Music, because of the regularity of its metrical structure, and with its pervasive tendency to rhythmically engage our body, is perfectly suited for action coordination.