**Abstract**

Musicians choose a main pulse to receive a special bodily investment, e.g. feeling

common time in whole-note or half-note pulses.  This understanding is formalized in Ito's theory

of focal impulses (2021), and this paper examines the impact of main-pulse choice on the

hierarchical organization of motor behavior.  In an experiment modeled on work by Sternad and

collaborators (e.g. Sternad, Dean, & Schaal, 2000), violinists played along with a metronome

that sounded either with a constant pitch and loudness or with a signal that alternated between

high or low pitch and loud or soft dynamic level. Violinists were told to play two notes for each

metronome pulse, and to feel a main pulse either every four notes or every two notes,

corresponding to the two metronome schemes. They were told to respond to a randomly timed

stimulus tone, after which the metronome stopped, either with a larger motion of the bow or

verbally. In the bowed conditions, responses clustered just before times at which bow strokes

would have occurred had the metronome not been interrupted. This clustering was much tighter

than that observed in the non-musical tasks of the experiments on which ours was modeled.

While, contrary to prediction, we did not observe significant differences between the numbers of

responses corresponding to strong and weak beats, feeling the pulse every four notes did allow

violinists to respond more quickly than when feeling the pulse every two notes.  We hypothesize

that this was because the "groove" was deeper when feeling the slower main pulse. In the verbal

condition, for which only the alternating metronome pulse was heard, violinists were found to

respond with constant reaction times. This suggests that the results for the bowed responses were

motoric rather than cognitive in nature.  Although we predicted a weaker entrainment between

bowing pattern and response in the verbal condition, we did predict some entrainment, on the

basis of Rusiewicz's Theory of Entrainment of Manual and Speech Systems (TEMSS). This

prediction was not confirmed.