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Timing Sensitivity in Vision and Audition: Performance Differences on Polyrhythmic and Isochronous Tempo Judgements

**Abstract** (character limit: 500)

Engaging in time perception through music has long been a celebrated and culturally relevant practice. What is peculiar, however, is that humans do not possess a specific sensory organ that is dedicated to perceiving time. Here we investigated whether timing precision varied across vision and audition, and whether the complexity of the meter impacted individuals’ sensitivity to tempo changes. We presented computer-generated stimuli and measured sensitivity to tempo changes. Visual stimuli comprised gratings that modulated at one tempo and plaids that combined tempos into a 3-against-2 polyrhythm. Auditory stimuli differed by three octaves and modulated in isolation or in a 3:2 ratio to create auditory polyrhythms. College students classified the tempo of each stimulus as faster or slower than an “average” tempo. Thresholds did not differ significantly across vision and audition, regardless of task. However, participants generated significantly lower (better) timing thresholds while making judgements on Slow Isolation Tempo trials than on Fast Isolation or Fast Polyrhythm Tempo conditions. The observed effect demonstrates that college students possess greater sensitivity to timing differences at slow tempos (*~120 beats per minute or 3 Hz*). In the context of our study, the implicit grouping of a polyrhythm did not aid nor distract the observer while making tempo judgements, and the sensory mode of the stimulus did not impact timing precision.