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**An exploration of attentional monitoring of isochronous
asynchronous streams in deviant detection and sensorimotor
synchronization**

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Past studies of auditory selective attention focused on location and/or pitch cues in stream segregation. In this study, two perceptually-segregated streams competed for attention in a perceptual-judgment task based on timbre cues and a sensorimotor task (tapping to the sounds of one stream). Both streams shared the same temporal structure (isochronous 100-ms events at 1.67 Hz) but were asynchronous (target-distractor asynchronies of -200, -100, 100, 200 ms), differed in pitch (712 or 1000 Hz) and could share or not their perceived location (diotic vs. dichotic). Deviants were amplitude modulated at 25 or 50 Hz and varied in temporal envelopes. Attentional filtering (distracting stream constant) was done using a discrimination task requiring pressing one of two keys upon hearing one of two deviants (Experiment 1) and a synchronization task requiring selective tapping to the high-pitch or low-pitch sounds (Experiment 3). Attentional monitoring (distracting stream varies) required maintaining attention to the same stream upon hearing slow-modulated deviants and switching attention to the other stream upon hearing the fast-modulated deviants. This was done for the discrimination task (Experiment 2) and synchronization task (Experiment 4). Perceptual and perceptuo-motor results suggest attentional-filtering and attentional-monitoring costs. Surprisingly, the mere presence of a non-concurrent stream in a different frequency band interferes with deviant-discrimination and synchronization-tapping performance.