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The Effect of Selective and Divided Attention on Perception of Auditory Change with Different Numbers of Auditory Streams

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Abstract

Sonification of physiological information in the operating room may be advantageous, but principles to guide the design of such sonifications need to be developed. How many auditory streams and how many auditory dimensions carrying information within a stream can be continuously monitored? The aim of this experiment was to explore the discriminability of changes in six acoustic dimensions, in multiple auditory streams (1, 2, or 3 streams) with selective and divided attention. In the divided attention condition only, participants detected changes while performing a forced-pace arithmetic task. Accuracy in detecting changes in the stimuli was highest with one stream but was not significantly different across divided and selective attention. Responding was fastest for one stream when attention was divided. These results suggest that there is a cost to processing multiple auditory streams, and selectively attending to dimensions within complex stimuli. The implications for the design of sonifications will be discussed.