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The effect of postural information on the perceived velocity of moving sound sources

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In this study, the effect of postural information on the perceived velocity of moving sound sources was investigated. Auditory information was presented via five surround speakers and five subwoofers. Two sounds were presented first in front of participants, and then these moved past them toward the rear. At the same time, rearward pitch motion was presented via a motion platform on which participants were situated. Duration of stimulus was 8 s. Initial distance of sound sources was set to 2.0, 4.0, 6.0, 8.0 and 10.0 m. Amplitude of pitch variation was 0, 0.2, 0.4, 1.0 and 2.0 degrees. Participants made magnitude estimates for speed of moving sound images, and judgment of goodness of movement matching between both auditory and postural information. The resulting speed magnitude estimates showed that pivot magnitude significantly affected the estimated velocity of sound sources except when velocity of sound sources was extremely high. Moreover, participants judged the multimodal match to be poor when the velocity of the moving sound sources was extremely high or low. These results suggest that the strongest multimodal interaction occurs when auditory information and postural variation are well matched, and are consistent with self motion.