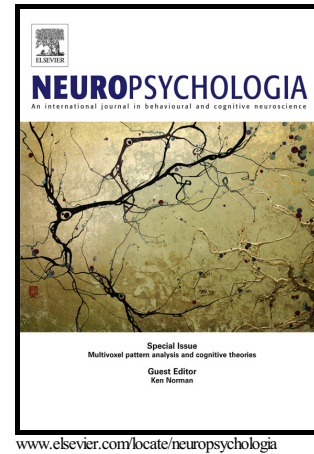


Author's Accepted Manuscript

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PII: S0028-3932(18)30393-2
DOI: <https://doi.org/10.1016/j.neuropsychologia.2018.07.027>
Reference: NSY6863

To appear in: *Neuropsychologia*

Received date: 30 October 2017
Revised date: 18 July 2018
Accepted date: 25 July 2018

Cite this article as: M. Chancel, C. Landelle, C. Blanchard, O. Felician, M. Guerraz and A. Kavounoudias, Hand movement illusions show changes in sensory reliance and preservation of multisensory integration with age for k i n a e s t h e s i a , *Neuropsychologia*, <https://doi.org/10.1016/j.neuropsychologia.2018.07.027>

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Hand movement illusions show changes in sensory reliance and preservation of multisensory integration with age for kinaesthesia

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Abstract

To perceive self-hand movements, the central nervous system (CNS) relies on multiple sensory inputs mainly derived from vision, touch, and muscle proprioception. However, how and to what extent the CNS relies on these sensory systems to build kinesthetic percepts as the systems decline with age remain poorly understood. Illusory sensations of right hand rotation were induced by separately stimulating these three sensory modalities at two intensity levels. A mechanical vibrator applied to the *pollicis longus* muscle, a textured disk for touching, and a visual pattern rotating under the participant's hand were used to activate muscle proprioception, touch, and vision, respectively. The perceptual responses of 19 healthy elderly adults (60-88 yrs) were compared to those of 12 younger adults (19-40 yrs). In the younger group, the three types of stimulation elicited similar kinesthetic illusions at each intensity level applied. The same visual and tactile stimuli elicited more salient and faster illusions in older adults than in younger adults. In contrast, the vibration-induced illusions were significantly fewer, less salient and delayed in the older adults. For the three modalities

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