

# INTERROGATING THE FUNCTIONAL INTERPRETATION OF JOINT MOVEMENT ILLUSIONS USING INTENTIONAL BINDING

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## ABSTRACT

Sensation of joint movement provided through a vibration-induced illusion has potential use in restoring lost kinesthetic sensations, such as those caused by amputation. In order to be usefully employed, the way in which sensations provided by the illusion are incorporated into the body's internal model for motor control must be explored. While literature suggests that vibration-induced illusion of a joint movement is generated by providing vibration to the antagonist muscle (e.g., elbow flexion illusion induced by vibrating the triceps), perception of limb movement appears to be more complex as vibration of a given muscle in targeted reinnervation amputees generates an illusion of joint movement associated with contraction of the vibrated muscle. To explore how vibration-induced illusion of joint movement is interpreted by the body's internal model, we investigated perceived compression of time (intentional binding) between an auditory signal and completion of a participant-controlled virtual arm movement paired to the movement illusion. In this paradigm, when conditions are more natural subjects experience compression of the time interval between an action and results of the action. Thus, the movement of a virtual arm shown to the subject that most closely matches the internal model's interpretation of the vibration-induced illusion can be identified.