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Cognitive and motor dynamics of speech processing during walking

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Abstract

Walking, traditionally considered an automated process, can become cognitively demanding during dual-task (DT). Up to now, language-motor interactions, such as walking and listening to speech remain underexplored in DT studies, despite the frequent co-occurrence of these activities in daily life. In addition, research on embodied semantics points at the potential of certain words' meaning interacting with actual body movements. Yet no study so far has addressed this issue in relation to gait. This ongoing experiment examines a) the potential motor-cognitive interference of concurrent walking and speech processing and b) the potential semantic effects when action verbs are actively processed during walking. We tested 20 adults using motion capture with concurrent optical imaging (fNIRS) to assess gait variation along with frontal and motor cortex activation. Preliminary findings suggest that gait patterns remain consistent with and without speech processing during walking. However, processing action-related verbs while walking is associated with reduced motor cortex activation.