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Are Facial Expressions Predictors for the Sense of Agency in a Dot Control Task?

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Abstract

In assessing the sense of agency (SoA) in the field, researchers are often confronted with the limitations of conventional methods (e.g., retrospectivity, task-disruption). Generally, facial analysis offers a promising possibility to overcome these obstacles by directly collecting objective data in real-time and without any need for contact. This paper examines the applicability of face tracking for SoA assessment by investigating whether facial expressions can be used to derive information about the extent to which users feel in control in interactions with technical systems. In a laboratory experiment ($N = 27$) based on the dot control task, we manipulated SoA via task difficulty and explored the effects on facial expression patterns. Three action units in the region of the mouth were observed to be characteristic facial indicators of SoA. These findings support the suitability of facial expressions for SoA evaluation as well as the potential of face tracking for monitoring SoA in various practical fields of application (e.g., automated driving).