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Sensory-motor control in autism

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Abstract

Despite being largely characterized as a social and cognitive disorder, strong evidence indicates the presence of significant sensory-motor problems in Autism Spectrum Disorder (ASD). However, the nature and thus potential root of these difficulties remain unclear.

By linearly progressing from the use of a standardized assessment tool to targeted kinematic assessment, this work begins to draw clear and defined links between measurable difficulties and subtle underlying sensory-motor assessment. Specifically, significant motor impairment seen in a group of children (7-10 yrs) with a diagnosis of ASD during preliminary assessment using the Movement Assessment Battery for Children (Whyatt & Craig, 2012), was systematically deconstructed to highlight specific difficulties in the broad categories of *manual dexterity* ($p<.05$) and *ball skills* ($p<.01$). Subsequent kinematic assessment using tailored manual dexterity and interceptive tasks implied insufficient levels of prospective temporal control. Thorough movement profiling identified significant difficulties with levels of prospective temporal control during precise spatial drawing tasks ($p<.05$), and an inability to adequately time interceptive reaching in relation to task or target demands ($p<.05$), resulting in the need for online, compensatory strategies. This underlying inability to use perceptual information to guide, adapt, and tailor movement to task demands directly inferred an underlying deficit in perception-action coupling. Further comparisons with two distinct control groups provided additional insight into the potential role of cognitive functioning. Overall results are discussed in-light of perception-action coupling and its role in early infant development suggesting that rather than being "secondary" level impairment, sensory-motor problems may be fundamental in the progression of ASD.

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