



Processing of Human Movement in Autism Spectrum Disorder

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ABOUT THE STUDY

Social difficulties, unusual sensory processing, and repetitive movements are just a few of the signs of Autism Spectrum Disorder (ASD). The symptoms of ASD appear to be influenced by broad aberrant processing and network connectivity, despite the fact that the neurological underpinnings of the disorder are not well known. Since human movements have been shown to transmit social information, it is believed that abnormal processing of human movement underlies some of the social difficulties in ASD. More evidence is provided by neuroimaging studies, which reveal that when processing biological motion, individuals with ASD engage different brain regions. According to a new meta-analysis of biological motion processing in autism, there are higher performance gaps between typical and ASD observers when participants are younger and when the test requires recognising complex information, such as emotion.

Inter-subject Correlation (ISC) analysis, a data-driven technique that can describe brain activity by watching real-life interactions, is a well-known technique for analysing brain activity while watching movies. By generating pairwise correlation coefficients on a voxel-by-voxel basis across all subjects for the whole stimulus duration, it measures the similarities in evoked fMRI responses across individuals. It has been demonstrated that naturalistic stimuli can elicit reliable neural responses in people and even higher test-retest reliability than is generally achieved with resting-state paradigms. Furthermore, it might be claimed that naturalistic stimuli, as opposed to static stimuli and tasks investigating single functions, better reflect complicated real-life dynamics.

Dance has previously been used to study the perception of human movement and the comprehension of action. For example, studies on action observation using dance revealed that understanding other people's movements requires the use of both motor representations and visual inference. Dance has also

been shown to produce ISC maps. A pilot study using 90-second segments from either the joyful or cultural dance repertory and typical observers revealed evidence that ISC may be attained in brain areas related to action comprehension. It also intends to look into intra-SC in both groups. Based on previous research using sophisticated, edited images, the ASD group is predicted to have lower overall ISC than the Traumatic Disorder (TD) group in response to the ballet movies.

The variation in symptoms among people with ASD may be explained by idiosyncratic patterns. Additionally, the possibility of sub-typing within the spectrum is supported by the fact that only a subset of participants with ASD displayed idiosyncratic patterns. Additionally, because idiosyncrasy in reactions has been connected to behavioural symptoms in ASD, this emphasises the educational relevance of researching individual differences. Additionally, Dinstejn et al. raise the possibility that inaccurate reactions play a part in how unpredictably people perceive their surroundings during development, which may affect how they behave later in life.

We intended to investigate variations in human movement processing between individuals who were autistic and participants who were generally developed, both on a group level and on an individual level. Results comparing the two groups revealed that the posterior cingulate was less synchronised in the autism group than in the typically developing group. Results from the intra SC revealed that those with autism exhibited more dispersed idiosyncratic patterns than people who were usually developed. Additionally, only a portion of the ASD group's participants exhibited unique patterns. Selective activation for the two movies was discovered on both a group- and an individual-level, despite the lack of a clear pattern. Our knowledge of the processes underlying the motor and social deficits seen in autism spectrum disorder. Future research into the use of dance videos to extract group differences or for possible diagnostic purposes.

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