

Challenging Weak Central Coherence: An Exploration of Neurological Evidence from Visual Processing and Linguistic Studies in Autism Spectrum Disorder

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Abstract : Autism spectrum disorder (ASD) is a neuro-developmental disorder that is characterized by persistent deficits in social communication and social interaction (i.e. deficits in social-emotional reciprocity, nonverbal communicative behaviors, and establishing/maintaining social relationships), as well as by the presence of repetitive behaviors and perseverative areas of interest (i.e. stereotyped or receptive motor movements, use of objects, or speech, rigidity, restricted interests, and hypo or hyperactivity to sensory input or unusual interest in sensory aspects of the environment). Additionally, diagnoses of ASD require the presentation of symptoms in the early developmental period, marked impairments in adaptive functioning, and a lack of explanation by general intellectual impairment or global developmental delay (although these conditions may be co-occurring). Over the past several decades, many theories have been developed in an effort to explain the root cause of ASD in terms of atypical central cognitive processes. The field of neuroscience is increasingly finding structural and functional differences between autistic and neurotypical individuals using neuro-imaging technology. One main area this research has focused upon is in visuospatial processing, with specific attention to the notion of 'weak central coherence' (WCC). This paper offers an analysis of findings from selected studies in order to explore research that challenges the 'deficit' characterization of a weak central coherence theory as opposed to a 'superiority' characterization of strong local coherence. The weak central coherence theory has long been both supported and refuted in the ASD literature and has most recently been increasingly challenged by advances in neuroscience. The selected studies lend evidence to the notion of amplified localized perception rather than deficient global perception. In other words, WCC may represent superiority in 'local processing' rather than a deficit in global processing. Additionally, the right hemisphere and the specific area of the extrastriate appear to be key in both the visual and lexicosemantic process. Overactivity in the striate region seems to suggest inaccuracy in semantic language, which lends itself to support for the link between the striate region and the atypical organization of the lexicosemantic system in ASD.

Keywords : autism spectrum disorder, neurology, visual processing, weak coherence

Conference Title : ICA 2020 : International Conference on Autism

Conference Location : London, United Kingdom

Conference Dates : September 24-25, 2020