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A comparison of central coherence skills between adolescents with an intellectual disability with and without comorbid autism spectrum disorder

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Abstract

Central coherence theory hypothesizes individuals with autism process information in a detail-focused fashion. The present study examined whether adolescents with an intellectual disability and comorbid autism spectrum disorder showed a weaker central coherence than age- and IQ-matched controls. The central coherence skills of 43 adolescents from schools for students with severe learning problems were examined with two cognitive tasks. In these two tasks, detail-focused processing is beneficial to global processing to perform the tasks accurately and quickly. The group with autism spectrum disorder performed better than the control group. Adolescents with an intellectual disability and with comorbid autism spectrum disorder have a weaker central coherence than age- and IQ-matched controls. Partial support was also given for variability in weak central coherence within the autism spectrum.

Keywords: Central coherence theory; Cognitive style; Detail-focused processing; Intellectual disability; Autism spectrum disorders

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About 75% of individuals with autism, and a lower but significant percentage of individuals with an autism spectrum disorder have an intellectual disability (Fombonne, 2003). About 20–30% of individuals with an intellectual disability also have autism or an autism spectrum disorder (Kraijer, 1997). Considering this high comorbidity questions are raised about the relationship between autism and having an intellectual disability. One way to examine this relationship is to investigate how individuals with an intellectual disability with and without autism spectrum disorders process information.

Central coherence theory hypothesizes that individuals with autism have a qualitatively different style of information processing (Frith, 1989). Based on the frequently observed dissociated cognitive abilities, such as the uneven cognitive profile (Happé, 1999) and islets of ability (Shah & Frith, 1993), this theory hypothesizes that individuals with autism spectrum disorders process information more locally, in a detail-focused way, and take less account of context. Thus, they are believed to have a weaker central coherence than individuals who process information more globally and take account of context. Behaviors that are characteristic for autism, such as impaired social communication and stereotyped play, are assumed to arise because of this weak central coherence.

In the last decade, this theory has been a topic in many studies in which central coherence skills of autistic individuals are compared to those of control samples (Happé, 1999). Studies in which central coherence skills are measured with visuospatial tasks largely confirm the theory. Individuals with autism perform tasks faster than control individuals, if a design or a picture had to be divided into their constituent parts. For example, individuals with autism perceive constituent blocks in unsegmented conditions of a block design task more easily (Happé, 1999; Shah & Frith, 1993) and perform better on embedded figures tasks, in which hidden shapes in pictures have to be found as quickly as possible (Happé, 1999; Shah & Frith, 1983). Studies in which central coherence skills are measured with perceptual or verbal-semantic tasks have revealed that autistic individuals have a tendency for fragmented perception (Happé, 1999; Jarrold & Russell, 1997) and benefit less from the context of meaning in sentences, narratives and memory tests (Jolliffe & Baron-Cohen, 1999). However, some studies failed to replicate these findings (Brian & Bryson, 1996). This inconsistency may be explained by the way in which central coherence skills were measured. For instance, central coherence skills can be measured as an inability to process globally, or as the ability to process globally but with a preference to process locally. Recent studies suggest that people with autism can process information globally when they are instructed to do so, but process locally when no such instructions are provided (Mottron, Belleville, & Menard, 1999; Rinehart, Bradshaw, Moss, Brereton, & Tonge, 2000).

Most studies that have investigated this theory limited their focus on higher functioning individuals with autism spectrum disorders (Jolliffe & Baron-Cohen, 1999; Rinehart et al., 2000). Based on the assumption that autistic individuals have a weak central coherence, regardless of age and cognitive ability, confirmation of weak central coherence in a group of autistic individuals with an intellectual disability would make the theory more robust. In addition, Happé (1999) and Ropar and Mitchell (2001) reported variability in weak central coherence within the autism spectrum. It was hypothesized that individuals with a more severe disability (i.e., autistic disorder) have a weaker central coherence than individuals with a less severe disability (i.e., with pervasive developmental disorder- not otherwise specified).