People with autism have a greater ability to process information: study

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A child with an autistic disorder. Credit: Anthea Sieveking, Wellcome Images.

(Medical Xpress) -- People with autism have a greater than normal capacity for processing information even from rapid presentations and are better able to detect information defined as 'critical', according to a study published today in the 'Journal of Abnormal Psychology'. The research, funded by the Wellcome Trust and the Economic and Social Research Council, may help to explain the apparently higher than average prevalence of people with autism spectrum disorders in the IT industry.

Autism is a lifelong developmental disorder that affects social interaction, communication and, often, learning; however, people with autism show an increased ability to focus attention on certain tasks. Yet clinical reports backed up by some laboratory research show that these individuals can be more sensitive to the distracting effects of irrelevant stimuli, such as flashing lights or particular sounds, which can be easily ignored by people without the disorder.

Professor Nilli Lavie, from the Institute of Cognitive Neuroscience at UCL, hypothesises that this combination of the ability to focus and a susceptibility to distraction might be caused by a higher than normal information processing capacity.

"Our work on perceptual capacity in the typical adult brain suggests a clear explanation for the unique cognitive profile that people with autism show," she says. "People who have higher perceptual capacity are able to process more information from a scene, but this may also include some irrelevant information which they may find harder to ignore. Our research suggests autism does not involve a distractibility deficit but rather an information processing advantage."

Professor Lavie, together with Dr Anna Remington and Dr John Swettenham from the UCL Developmental Science department, tested this hypothesis on 16 adult volunteers with autism spectrum disorders and compared their results against those of 16 typical adults in a task to challenge their perceptual load capacity.

The task involved looking at a circle of letters flashed very briefly on the screen and searching for some 'target' letters. At the same time, the participants were also asked to detect a small grey shape that occasionally appeared outside the letter circle.

When only one or two letters were flashed on the screen, the researchers found that both groups could successfully find the letter and detect the shape. However, making the search task more challenging by increasing the number of letters significantly impaired the detection performance of the typical adults - but not of the adults with autism spectrum disorders, who were able to detect the extra shape just as well in the more challenging conditions. When the task became harder, they significantly outperformed the typical adults.

Professor Lavie says: "Our study confirms our hypothesis that people with autism have higher perceptual capacity compared to the typical population. This can only be seen once the task becomes more demanding, with more information to process. In the more challenging task conditions, people with autism are able to perceive significantly more information than the typical adult."

Professor Lavie believes that the finding may help explain why people with autism spectrum disorders, such as Asperger's syndrome, may excel in some careers such as IT, which can require intense concentration and the ability to process a great deal of information from a computer screen. Autism diagnoses in California's Silicon Valley reportedly increased three-fold in the 1990s, a phenomenon termed 'geek syndrome' by 'Wired' magazine.

"Our study clearly shows that people with autism can do better than typical adults in tasks involving rapid presentations of a lot of information," says Professor Lavie. "There are clearly careers, such as in IT, that can benefit from employing people with high-functioning autism spectrum disorders."

"These findings could also enable clinicians and families to help individuals with autism spectrum disorder capitalise on their strengths by exploiting the increase in perceptual capacity," adds Dr Remington.

The research also sheds light on the relationship between autism and 'savants', such as artist Stephen Wiltshire (who is able to draw in incredible detail a scene seen for only a few seconds) and Kim Peek (on whom the eponymous character of the film 'Rain Man' was based). The researchers argue that these abilities are, in part, likely to be a consequence of their high perceptual capacity; however, their study suggests that most people with autism share this characteristic, regardless of whether they possess exceptional savant-like abilities.

More information: Remington AM et al. Lightening the load: perceptual load impairs visual detection in typical adults but not in autism. *J Abn Psychol* 2012. psycnet.apa.org/psycinfo/2012-06742-001/

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