



What mechanisms underlie reduced social attention in people with ASD?

By Dr. Jessica Edwards

A key predictor of an autism spectrum disorder (ASD) diagnosis is attenuated attention to social stimuli.¹ Thus far, the reasons underlying this abnormality are unknown: some have hypothesized reduced social motivation² while others have suggested aberrant oculomotor function in affected individuals.³ With regards to the latter, most researchers have studied oculomotor function during restricted viewing tasks (i.e. experimentally manipulated gaze behaviour). Unfortunately, the data obtained from such studies might not translate to natural visual explorations.

To address this problem, Nico Bast and colleagues studied oculomotor function by remote eye tracking, as individuals with (n=142) or without (n=142) ASD watched naturalistic videos. The researchers compared parameters including saccade (rapid eye movement between fixed points), fixation, and pupil dilation between the two participant groups. Then, they correlated their findings with clinical measures of ASD. They found that individuals with ASD exhibited reduced saccade duration and amplitude, regardless of whether there was human content in the videos. These differences in saccade features correlated with measures of restricted and repetitive behaviours. Conversely, there were no differences in terms of fixation or pupil dilation between the two groups.

“For 20 years, eye-tracking research has investigated the *HOW* of social attention in autism, and we now know that people with autism tend to spend less time looking at social stimuli during visual exploration”, explains Bast. “Here, we shifted our attention to the *WHY* of social attention and concluded that reduced social attention is not the result of attenuated social motivation, but rather due to differences in sensory processing of and attention to the environment.”

Future studies that investigate the causes of this different perception that underlies autism symptoms are now warranted. For now, Bast *et al.* hypothesize that altered pontocerebellar motor modulation might underlie erratic oculomotor execution and attenuated visual exploration in people with ASD.

Referring to:

Bast, N., Mason, L., Freitag, C.M., Smith, T., Portugal, A.M., Poustka, L., Banaschewski, T., Johnson, M. & The EU-AIMS LEAP Group. (2020), *Saccade dysmetria indicates attenuated visual exploration in autism spectrum disorder*. *J. Child Psychol. Psychiatr.* doi: 10.1111/jcpp.13267.

References:

¹Jones, E.J. *et al.* (2016). *Reduced engagement with social stimuli in 6-month-old infants with later autism spectrum disorder: A longitudinal prospective study of infants at high familial risk*. *J. Neurodev. Disord.* 8, 7. doi: 10.1186/s11689-016-9139-8.

²Chevallier, C. *et al.* (2012). *The social motivation theory of autism*. *Trends Cogn. Sci.* 16, 231–239. doi: 10.1016/j.tics.2012.02.007.

³Johnson, B.P. *et al.* (2016). *Ocular motor disturbances in autism spectrum disorders: Systematic review and comprehensive metaanalysis*. *Neurosci. Biobehav. Rev.* 69, 260–279. doi: 10.1016/j.neubiorev.2016.08.007.