

Adults with autism spectrum condition have atypical perception of ambiguous figures when bottom-up and top-down interactions are incongruous

Monika Intaité, Alexandra L Georgescu, Valdas Noreika, Marie AO von Saldern, Kai Vogeley and Christine M Falter-Wagner

Human visual perception involves the processing of individual objects, known as low-level processing, as well as the processing of objects as part of a larger visual scene, known as high-level processing. We aimed to investigate the interaction between low- and high-level processing of visual stimuli in individuals with an autism spectrum condition (ASC). We presented an ambiguous square shape that can be perceived in two different orientations (a type of optical illusion, similar to a Necker Cube), to 31 adult ASC participants and 22 typical adult participants. In addition, we presented an unambiguous version of the figure in the same and/or different location compared to the ambiguous figure. This allowed us to disentangle between low-level processing (of individual objects) and high-level processing (of objects as part of a larger scene). Our results show differences between the two groups with regard to how they interpreted the ambiguous shape depending on the way it was presented, and suggest that these group differences depend on the interaction between the lower and higher levels of visual processing. Our results suggest minor atypicalities in the visual perception of participants with ASC, which occur only when low- and high-level processes provide conflicting information (i.e., when the individual object conflicts with the larger scene). In this situation, participants with ASC rely more heavily on low-level processing (of individual items) in interpreting the ambiguous shape before them.