

AB069. Defining the perceptual profiles of children and adolescents with a neurodevelopmental condition

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Background: Perceptual profiles, or the performance on visual-perceptual tasks that reflect early visual information processing, have been used to suggest condition-specific visuo-perceptual abilities across neurodevelopmental conditions (NDCs). The complexity-specific hypothesis (Bertone *et al.*, 2010) was based on perceptual profiles defined by a selective decrease in sensitivity to more complex, texture-defined information in adults with autism and fragile-x syndrome, suggesting the atypical development of neural networks underlying early perception in NDCs. The aim of this study was to evaluate whether the complexity-specific hypothesis is applicable to children and adolescents with different NDCs by defining and comparing their perceptual profiles.

Methods: A single interval, two alternative forced-choice identification paradigm was used to measure the perceptual profiles of 64 participants with a NDC (MIQ =78) and 43 typically developing (TD) participants (MIQ =103), aged 5 to 17 years. Participants with a NDC were diagnosed with either: autism spectrum disorder (ASD, n=32), attention deficit/hyperactivity disorder (ADHD, n=9), or intellectual disability (ID, n=12). Perceptual profiles were defined by measuring participants' sensitivity to static (orientation identification task) and dynamic (direction identification task) gratings (1 cpd) defined by either luminance (simple) or texture (complex) information. The Weschler Abbreviated Scale of Intelligence 2 (WASI-2) was used as a measure of cognitive ability.

Results: When performance was averaged across NDC and TD participants, no between-group difference in sensitivity was found for any of the conditions assessed. However, when assessed as a function of diagnosis, we found that the ID group was less sensitive to both the luminance ($P=0.04$) and texture-defined ($P=0.01$) dynamic information when compared to the TD group. Notably, although the perceptual profile of the ASD group was similar of that of the TD group, a significant positive relationship between mental age and sensitivity to both texture-defined static ($r=-0.5$) and dynamic ($r=-0.4$) information was found.

Conclusions: The findings demonstrate that different conditions-specific perceptual profiles exist across children and adolescents with different types of NDCs, exemplified by differences found in this study for the ID group. In addition, the positive relationship between perceptual performance and mental age within the ASD group suggests that these perceptual abilities may still be undergoing maturation during the age-range assessed, and provides support for the complexity-specific hypothesis specific to the ASD profile during development. These results exemplify the importance of defining perceptual profiles at different periods of development across NDCs, since the tenets of most perceptually-relevant cognitive theories are based primarily on adult data.

Keywords: Neurodevelopment conditions; perception; first and second order information processing; neural networks

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