

Rule learning is affected by the social nature of the stimuli in the Autism Spectrum Disorder

Rule Learning (RL) is an implicit learning mechanism that allows to extract and generalize abstract rules from a sequence of elements without intention to learn. This capacity to learn complex regularities is thought to be a prerequisite for learning of language rules and for social intuition and adaptation to one's social environment. Despite the relevance of RL for linguistic and social abilities, surprisingly, no studies have investigated this mechanism in the Autism Spectrum Disorder (ASD), a disorder characterized by abnormalities in language, communication and social interaction. Here, we investigated the presence of RL in high functioning autistic individuals, examining their ability to extract and generalize rule-like patterns from sequences of social and non-social stimuli. Using a forced-choice paradigm, two groups of adolescents (mean age = 17), one with diagnosis of ASD (N = 5) and one with typical development (N = 10) were presented with triplets of stimuli organized in ABB or ABA rule-like patterns. ABB is a rule-like pattern easier to learn as it involves a late repetition of the B elements, whereas ABA is a rule-like pattern harder to learn as it involves the nonadjacent repetition of the B elements. Geometric shapes, upright-faces and inverted-faces were used as stimuli. During the test phase, a new ABB or ABA triplet was shown, and reaction times (RT) to recognize the rule were recorded. Preliminary results show that the control group was more accurate and faster in identifying the rule in the presence of geometric shapes than with upright and inverted faces regardless the complexity of the pattern (ABB vs ABA). Conversely, the ASD group was less accurate and slower in recognizing the rule with upright faces. Moreover, the complexity of the rule modulated ASD participants' accuracy with upright and inverted faces. These findings provide evidence that ASD individuals are able to learn and generalize a high-order rule, and that their RL ability is modulated by the social nature of the stimuli.

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