

Cognitive Control Moderates the Concurrent Effect of Autistic and Schizotypal Traits on Divergent Thinking

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Abstract : Divergent thinking—a cognitive component of creativity—and particularly the ability to generate unique and novel ideas, has been linked to both autistic and schizotypal traits. However, to our knowledge, the concurrent effect of these trait dimensions on divergent thinking has not been investigated. Moreover, it has been suggested that creativity is associated with different types of attention and cognitive control, and consequently how information is processed in a given context. Intriguingly, consistent with the diametric model, autistic and schizotypal traits have been associated with contrasting attentional and cognitive control styles. Positive schizotypal traits have been associated with reactive cognitive control and attentional flexibility, while autistic traits have been associated with proactive cognitive control and the increased focus of attention. The current study investigated the relationship between divergent thinking, autistic and schizotypal traits and cognitive control in a non-clinical sample of 83 individuals (Males = 42%; Mean age = 22.37, SD = 2.93), sufficient to detect a medium effect size. Divergent thinking was evaluated in an adapted version of the Figural Torrance Test of Creative Thinking. Crucially, since we were interested in testing divergent thinking productivity across contexts, participants were asked to generate items from basic shapes in four different contexts. The variance of the proportion of unique to total responses across contexts represented a measure of context adaptability, with lower variance indicating increased context adaptability. Cognitive control was estimated with the Behavioral Proactive Index of the AX-CPT task, with higher scores representing the ability to actively maintain goal-relevant information in a sustained/anticipatory manner. Autistic and schizotypal traits were assessed with the Autism Quotient (AQ) and the Community Assessment of Psychic Experiences (CAPE-42). Generalized linear models revealed a 3-way interaction of autistic and positive schizotypal traits, and proactive cognitive control, associated with increased context adaptability. Specifically, the concurrent effect of autistic and positive schizotypal traits on increased context adaptability was moderated by the level of proactive control and was only significant when proactive cognitive control was high. Our study reveals that autistic and positive schizotypal traits interactively facilitate the capacity to generate unique ideas across various contexts. However, this effect depends on cognitive control mechanisms indicative of the ability to proactively maintain attention when needed. The current results point to a unique profile of divergent thinkers who have the ability to respectively tap both systematic and flexible processing modes within and across contexts. This is particularly intriguing as such combination of phenotypes has been proposed to explain the genius of Beethoven, Nash, and Newton.

Keywords : autism, schizotypy, creativity, cognitive control

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