

The Association Between Intelligence, Executive Functions and Self-Control Ratings in a
Typically Developing Sample of Children
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Measures of cognitive abilities (including intelligence and executive functions) and measures of self-control are core constructs used to characterize the development of self-regulation. The association between different measures of cognitive abilities and measures of self-control has received relatively little attention in the research literature. Attention-Deficit/Hyperactivity Disorder (ADHD) is a disorder which is characterized by difficulties with self-regulation. However, there is relatively less work that has examined how different measures of cognitive abilities and self-control are related in developmental samples, especially non-clinical samples. Our work utilizes data from a typically developing sample of children so as to provide a clearer picture of the cohesive role of cognitive abilities in ratings of self-control, without the confounding effects of a clinically diagnosed neurodevelopmental disorder.

The constructs of executive function, intelligence, and self-control were selected for this study as they have been used to assess self-regulation. Executive functions (EF) represent a number of top-down neurocognitive processes required for goal directed behaviour (Benedek, Jauk, Sommer, Arendasy, & Neubauer, 2014; Miller & Cohen, 2001) that continue to develop in the childhood and adolescence years (Anderson, 2002; Zelazo, Craik & Booth, 2004) and are associated with the prefrontal cortex of the brain (Miyake & Freidman, 2012). EFs are important in emotional and behavioural regulation (Gioia, Isquith, Guy & Kenworthy, 2000) and in content-appropriate responses (Pennington & Ozonoff, 1996). They are important aspects of an individual's development that predict behaviours in everyday life (Best, Miller & Jones, 2009) and adaptive functioning in adolescence (Clark, Prior & Kinsella, 2002). Previous research indicates that almost all cognitive abilities are somewhat related (Salthouse & Davis, 2006),

whereby individual differences in general intelligence are hypothesized to be driven by differences in executive functions (EF) (Benedek, 2014). Both intelligence and EF are multidimensional in nature and of importance in the field of developmental psychology, as they predict an individual's performance on complex tasks (Miyake et al., 2000) in school, work and everyday living situations (Jurado & Rosselli, 2007; Deary, Strand, Smith & Fernandes, 2007). Much work has been done to delineate the processes that make up intelligence and EF (Diamond, 2013), the neurodevelopmental trajectories related with acquisition of these processes, and most importantly how intelligence and EF processes are related (Dennis et al., 2009). So far, EF and intelligence have been examined as separate constructs; yet, they have been found to be common predictors of impairments in self-control in children with ADHD. Self-control is an important aspect of childhood and adolescence as it relates to poor school performance, antisocial behaviour, poor health and smoking (Baumeister, Heatherton & Tice, 1994; Moffitt et al., 2011).

The operationalization of self-regulation is critical for the assessment of children and youth, and this study will provide an important investigation of the associations between intelligence, executive functions, and self-control to inform our understanding of the development and associations between these processes using a typically developing sample of children. This work will provide important baseline information that will help to better understand how these processes may be affected in atypically developing children and youth.

Audience and participants at the Ontario Psychological Association's Summit on Innovation in Psychology will appreciate work that strives for developmental sensitivity and clinical relevance, and towards a better understanding of the neuropsychology behind difficulties in self-regulation. Ultimately, we hope that by presenting our results we can drive further research in the field of assessment, cognition and development, by highlighting some of the underlying, possibly separate, yet related, common drivers of behaviour.

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