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A behavioral genetic analysis of relationships between executive functions, intelligence, impulsivity, and multiple reports of adolescent behavioral problems.

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ABSTRACT:

Executive functioning (EF) and impulsivity measures both relate to psychopathology. However, self-report measures of impulsivity and laboratory EF tasks typically display small correlations, raising the question of whether impulsivity and EFs tap separate aspects of self-regulation that could be differentially related to psychopathology. Furthermore, intelligence is sometimes equated with EF, raising the question of whether these cognitive constructs account for the same variance in psychopathology. Using data from the Colorado Twin Study (COTwins; 812 twins aged 14-18), we examined the phenotypic and genetic relationships among latent variables for different components of EFs (constructed from a task battery designed to assess inhibiting, updating working memory, and set-shifting abilities) and intelligence, as well as impulsivity facets (UPPS-P scales, and their relationships to self- and parent-reported psychopathology symptoms (Achenbach Youth Self-Report and Child Behavior Checklist) in adolescence. EFs and intelligence were not significantly related to any impulsivity facets. EFs showed moderate to strong positive relationships with intelligence, but EFs and intelligence displayed different associations with psychopathology. General EF was negatively related to self- and parent-reported internalizing problems at the phenotypic but not genetic level. In contrast, intelligence was positively associated with self-reported internalizing problems and negatively associated with parent-reported externalizing at the phenotypic and genetic levels. Finally, negative urgency was positively phenotypically and genetically related to both self- and parent-reported internalizing and externalizing problems. Overall, these results suggest that EFs, intelligence, and impulsivity are differentially related to internalizing and externalizing psychopathology at the phenotypic and genetic levels in adolescence.

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