

## Cerebellar Contributions to Impulsivity Phenotypes

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The role of the cerebellum in motor function has been well characterized. Increasingly, evidence suggests that the cerebellum also is important in many non-motor higher level cognitive processes as well. It has long been observed that both structural and functional cerebellar abnormalities are associated with ADHD; however the mechanism by which these abnormalities contribute to specific symptoms is unknown. One possible mechanism is that cerebellar dysfunction could directly influence cognitive processes that influence the likelihood of impulsivity. Impulsivity is a central clinical feature of many psychiatric illnesses including Attention Deficit/Hyperactivity Disorder (ADHD) and substance use disorders. To examine the relationship between cerebellar dysfunction and ADHD, we tested the hypothesis that anatomic differences in cerebellar volume are associated with different forms of impulsivity.

18 (89% female) young adults (age 18-24) participated in this study. Subjects completed two tests to characterize different forms of impulsivity; the Stop Signal Task and the Delay Discounting Task, and underwent an MRI brain imaging anatomical scan. Subjects were characterized (using a median split) as high or low impulsive on each type of impulsivity. Volumetric analysis of the cerebellum was completed to determine differences in cerebellar volume associated with each type of impulsivity. Differences in volume were found based on type of impulsivity (response inhibition compared to delay discounting) supporting both a role for cerebellar dysfunction associated with impulsivity, and supporting dissociable contributions of cerebellar circuitry to different forms of impulsivity.