

# Impact of impulsivity on brain structures associated with academic achievement

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## Abstract

The influence of impulsivity on the relationship between academic achievement (Grade Point Average, GPA) and brain structure remains underexplored. To address this question, a total of 153 college students' GPA, impulsivity, and T1-weighted anatomical images were measured. We investigated which brain areas are related to the GPA of college studies, whether the identified regions are also associated with their impulsivity, and whether impulsivity plays a mediating role in the relationship between the identified regions and GPA. The analyses revealed the gray matter volume (GMV) of right caudate was negatively associated with an individual's level of GPA and was positively correlated with impulsivity. The impulsivity showed a negative mediation effect on the relationship between the GMV of right CN and impulsivity. Our results indicate the caudate nucleus plays crucial roles in a student's performance and associated impulsivity. Various interventions targeting impulsivity could improve educational outcomes by addressing the underlying neurobiological factors.