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## What drives the relation between cognitive ability, conscientiousness, self-perceived ability and school grades?

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### ABSTRACT:

The overall level of education has been increasing worldwide over the last decades, still interindividual differences in learning are a topic of interest regarding life outcomes in adulthood. Phenotypic research identified that personal characteristics such as cognitive ability (IQ), conscientiousness (CON) and self-perceived ability (SPA) predict differences in school grades. In educational research, origins of SPA have long been assumed to be environmental, however substantial genetic contributions have been detected in behavioral genetic analyses. The object of this study is to investigate the common etiology of these three predictors and their association with school grades as well as how genetic and environmental contributions differ between age groups and school subjects. The sample consists of over 2000 twin pairs (aged 11 and 17) and their siblings participating in the German TwinLife study. Using a multivariate twin-sib design, we analyze common genetic and environmental effects on IQ, CON, SPA and school grades in math and German in two age groups. Results confirm genetic effects for all three predictors of up to 55% as well as (non-) shared environmental effects. Multivariate analyses show that the association with school grades in math and German as well as the relation between CA, CON and SPA is largely due to common genetic effects. In addition, non-shared environmental effects matter across age groups and domains, while shared twin specific environmental effects are only relevant for the relation between SPA and school grades, however effects are small.

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