

Substance use reduces educational achievement even when educational benefits are assured

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Although various kinds of substance use are associated with reduced educational attainment, these associations have been mixed and may also be partially due to risk factors such as socioeconomic disadvantages. A study of substance use and education among male twins from a veteran population has found a strong relationship among early alcohol use, alcohol dependence, daily nicotine use, and fewer years of educational attainment.

Results will be published in the August 2012 issue of *Alcoholism: Clinical & Experimental Research* and are currently available at Early View.

"Evidence for an association between [substance use](#)/abuse/dependence and reduced lifetime [educational attainment](#) is mixed," said Julia D. Grant, research assistant professor of psychiatry at Washington University School of Medicine as well as corresponding author for the study.

"In addition," said Matt McGue, a professor in the department of psychology at the University of Minnesota, "what is missing is an explanation for the basis of the association. We might consider two possibilities. One, adolescent substance use results in diminished educational achievement because substance use is neurotoxic to the developing adolescent brain, or because adolescents who use substances

have experiences that reduce the likelihood they will pursue higher [education](#)."

Another possibility, he added, is that "individuals who use substances in adolescence differ from those who do not on a range of risk factors prior to substance use exposure, which not only lead to their use of substances but also reduce the likelihood they achieve a college education. This possibility means that adolescent substance use is merely an indicator of the risk factors that diminish the likelihood of college attainment."

"Because our participants were in their late 30s when their educational attainment was assessed, we were better able to address lifetime educational attainment than most previous studies, which have focused on high school dropouts or educational attainment in 18-25 year-olds," said Grant. "We also examined educational attainment in a veteran cohort that had access to education via benefits of the G.I. bill, thereby alleviating some of the economic barriers to higher education that might otherwise be confounded with alcohol and drug outcomes."

Grant and her colleagues examined data collected from two points in time: a 1987 questionnaire, and a 1992 telephone diagnostic interview of 6,242 male twins (n=3,121 pairs with a mean age of 41.9 years in 1992) who had served in the U.S. military during the Vietnam-era and were therefore eligible for educational benefits after military service. Specific factors addressed were reduced educational attainment – defined as less than 16 years – as well as early alcohol and cannabis use, daily [nicotine](#) use, lifetime cannabis use, and alcohol, nicotine, cannabis, and any illicit drug dependence.

"Although all substance use measures were associated with lower educational attainment in preliminary analyses," said Grant, "only early alcohol use, [alcohol dependence](#), and daily nicotine use remained significantly associated with reduced educational attainment in twin pairs

discordant for substance use. In contrast, the associations between cannabis/other illicit drugs and educational attainment were not significant, suggesting that this association may be attributable to familial influences shared by the two measures."

"In this study, they conclude that within twin pairs discordant for adolescent substance use, the unexposed twin was more likely to complete college than his/her exposed cotwin," said McGue. "This provides much stronger support for a causal influence than a standard epidemiological study because of the control afforded by comparing the discordant twins. However, it is important to recognize that it does not prove causality."

"It is possible that early alcohol use and alcohol dependence impede later educational attainment," noted Grant. "Possible mechanisms for this include cognitive and motivational changes stemming from early alcohol use/dependence that hinder academic success. Although daily nicotine use is not likely to impair cognitive functioning, it may lead to motivational changes that affect academic performance. It is also possible that the association between these [substances](#) and lower educational attainment remains because both are attributable to a factor that we did not control for in our present analyses, such as personality characteristics and cognitive ability prior to substance use."

Grant said these findings underscore the complicated relationship between substance use and educational attainment.

"By controlling for all familial influences that contribute to both substance use and educational attainment, through our discordant twin design, we have a much stronger indicator of the direct association between substance use and educational attainment," she said. "However, because we were studying higher levels of education – 16+ years – in high school graduates, we may have understated the true effect of

alcohol on education. It may be that these effects are more pronounced at even lower levels of education. Nonetheless, our findings lend credence to ongoing public health efforts to reduce adolescent smoking and drinking, which in turn may have beneficial effects on school dropout and lifelong educational attainment."

Provided by Washington University School of Medicine

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