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Socioeconomic status moderates genetic and environmental influences on alcohol use

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Research on genetic and environmental influences underlying alcohol use has thus far failed to uncover specific causes, likely because genetic and environmental influences vary by context. A study of the moderating effects of socioeconomic status (SES) on genetic and environmental influences on alcohol use has found that genetic effects on amount of alcohol use are greater in socioeconomically disadvantaged environments.

Results will be published in the April 2015 online-only issue of *Alcoholism: Clinical & Experimental Research* and are currently available at Early View.

"Researchers have had little limited success thus far when it comes to identifying the genetic and environmental factors that affect alcohol use," said Nayla Hamdi, a doctoral student at the University of Minnesota. "Research has suggested that the size of genetic and environmental effects on alcohol use varies by contextual factors - for example, whether individuals live in an urban or rural environment. We were interested in building on this literature by examining if the size of genetic and environmental influences on alcohol use also depends on socioeconomic status (SES), an important but understudied contextual factor in this area of research."

"Previous research has ... focused on whether SES is associated with average levels of drinking, and has shown that the association depends on the developmental stage, such as adolescence versus adulthood, and

drinking index, such as quantity, frequency, problems," added Matt McGue, Regents Professor in the department of psychology at the University of Minnesota. "The current study is relatively unique in that it focuses on individual differences in drinking - as indexed by the variance - rather than average levels of drinking."

"Two previous studies found that genetic and/or environmental effects on alcohol use vary by level of education," noted Hamdi. "Ours is the first to examine whether income moderates genetic and environmental effects on alcohol use. Our study is also the first to examine these interaction effects in an adult sample spanning the ages of 25 to 74."

Hamdi and her colleagues used data from the MacArthur Foundation Survey of Midlife Development in the United States, initially conducted during 1995-1996 to examine physical health, psychological wellbeing, and social responsibility throughout midlife, with a reassessment of participants during 2004-2006. This study examined a sample of 672 complete twin pairs, ages 25-74, comprised of 350 monozygotic (MZ) pairs and 322 dizygotic (DZ) pairs. Phone interviews and self-administered questionnaires were used to examine whether SES, measured by household income and educational attainment, moderates genetic and environmental influences on three indices of alcohol use: amount used, frequency of use, and problem use.

"Our study's key finding is that genetic and environmental effects on the amount of alcohol use are not constant across all individuals in the population," said Hamdi, "but instead vary by the socioeconomic context."

"The variance of quantity consumed was substantially greater in the lower SES group than in the higher SES group," added McGue, "but average drinking amount was mostly uncorrelated with SES. This indicates that there is greater heterogeneity in the drinking patterns for

those with lower as compared to higher SES; for example, it seems likely that the low SES group includes more light or abstemious drinkers and more heavy drinkers than the high SES group."

"We found that genetic differences between individuals explained more variation in the amount of alcohol use in low SES environments compared to high SES environments," said Hamdi. "Researchers often interpret this sort of finding to indicate that stressors associated with low SES environments trigger genetic vulnerabilities for alcohol use."

"Conversely, for the high-SES group," added McGue, "genetic influences on drinking amount were smaller and shared environmental influences were stronger as compared to the low-SES group. This pattern seems to me consistent with the high-SES group being exposed to cultural factors - roughly equated to shared environmental influence - that encourage drinking but only in moderation. Perhaps norms surrounding drinking are more uniform in a high- as compared to low-SES context."

"Our findings suggest that scientists searching for genes that influence alcohol use should consider studying a low-SES population, given that genes explain more variation in the amount of alcohol used in this population," said Hamdi.

McGue agreed. "I think the major advance here is highlighting the importance of variance, that is, individual differences in drinking at different levels of SES," he said. "This study suggests that one important contributor to a rather complex relationship between SES and drinking is that the drinking is much more heterogeneous at lower as compared to higher SES levels."

"I would hope that our findings may help the average reader understand that the genetic and environmental influences underlying how much

alcohol individuals consume vary depending on individuals' broader socioeconomic context," said Hamdi. "This means that genes and environments do not influence alcohol use in isolation but rather in interaction with one another."

Provided by Alcoholism: Clinical & Experimental Research