

# Adolescence: When drinking and genes may collide

October 17 2013

---

Many negative effects of drinking, such as transitioning into heavy alcohol use, often take place during adolescence and can contribute to long-term negative health outcomes as well as the development of alcohol use disorders. A new study of adolescent drinking and its genetic and environmental influences has found that different trajectories of adolescent drinking are preceded by discernible gene-parenting interactions, specifically, the mu-opioid receptor (OPRM1) genotype and parental-rule-setting.

Results will be published in the March 2014 issue of *Alcoholism: Clinical & Experimental Research* and are currently available at Early View.

"Heavy drinking in adolescence can lead to alcohol-related problems and [alcohol dependence](#) later in life," said Carmen Van der Zwaluw, an assistant professor at Radboud University Nijmegen as well as corresponding author for the study. "It has been estimated that 40 percent of adult alcoholics were already [heavy drinkers](#) during adolescence. Thus, tackling heavy drinking in adolescence may prevent later alcohol-related problems."

Van der Zwaluw said that both the dopamine receptor D2 (DRD2) and OPRM1 genes are known to play a large role in the neuro-reward mechanisms associated with the feelings of pleasure that result from drinking, as well as from eating, having sex, and the use of other drugs.

"Different genotypes may result in different neural responses to alcohol

or different motivations to drink," she said. "For example, OPRM1 G-allele carriers have been shown to experience more positive feelings after drinking, and to drink more often to enhance their mood than people with the OPRM1 AA genotype. In addition, we chose to examine the influence of parental alcohol-specific rules because research has shown that, more than general measures of parental monitoring, alcohol-specific rule-setting has a considerable and consistent effect on adolescents' drinking behavior."

Van der Zwaluw and her colleagues used data from the Dutch Family and Health study that consisted of six yearly waves, beginning in 2002 and including only adolescents born in the Netherlands. The final sample of 596 adolescents (50% boys) were on average 14.3 years old at Time 1 (T1), 15.3 at T2, 16.3 at T3, 17.7 at T4, 18.7 years at T5, and 19.7 years at T6. Saliva samples were collected in the fourth wave to enable genetic testing. Participants were subsequently divided into three distinct groups of adolescent drinkers; light drinkers (n=346), moderate drinkers (n=178), and heavy drinkers (n=72).

"It was found that adolescent drinkers could be discriminated into three groups: light, moderate, and heavy drinkers," said Van der Zwaluw.

"Comparisons between these three groups showed that light drinkers were more often carriers of the OPRM1 AA 'non-risk' genotype, and reported stricter parental rules than moderate drinkers. In the heavy drinking group, the G-allele carriers, but not those with the AA-genotype, were largely affected by parental rules: more rules resulted in lower levels of alcohol use."

Van der Zwaluw explained that although evidence for the genetic liability of heavy alcohol use has been shown repeatedly, debate continues over which genes are responsible for this liability, what the causal mechanisms are, and whether and how it interacts with environmental factors. "Longitudinal studies examining the development

of alcohol use over time, in a stage of life that often precedes serious alcohol-related problems, can shed more light on these issues," she said. "This paper confirms important findings of others; showing an association of the OPRM1 G-allele with adolescent alcohol use and an effect of parental rule-setting. Additionally, it adds to the literature by demonstrating that, depending on [genotype](#), [adolescents](#) are differently affected by parental rules."

The bottom line is that parents can be a positive influence, Van der Zwaluw noted. "This study shows that strict parental rules prevent youth from [drinking](#) more [alcohol](#)," she said. "However, one should keep in mind that every adolescent responds differently to parenting efforts, and that the effects of parenting may depend on the genetic make-up of the adolescent."

Provided by Alcoholism: Clinical & Experimental Research

Citation: Adolescence: When drinking and genes may collide (2013, October 17) retrieved 20 March 2024 from <https://medicalxpress.com/news/2013-10-adolescence-genes-collide.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--