

Conduct Disorder and Initiation of Substance Use: A Prospective Longitudinal Study

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Objective: To examine the influence of conduct disorder (CD) on substance use initiation. **Method:** Community adolescents without CD ($n = 1,165$, mean baseline age = 14.6 years), with CD ($n = 194$, mean baseline age = 15.3 years), and youth with CD recruited from treatment ($n = 268$, mean baseline age = 15.7 years) were prospectively followed and re-interviewed during young adulthood (mean ages at follow-up respectively: 20, 20.8, and 24). Young adult retrospective reports of age of substance initiation for 10 substance classes were analyzed using Cox regression analyses. Hazard ratios of initiation for the CD cohorts (community without CD as the reference) at ages 15, 18, and 21 were calculated, adjusting for baseline age, gender, and race/ethnicity. **Results:** Among community subjects, CD was associated with elevated adjusted hazards for initiation of all substances, with comparatively greater hazard ratios of initiating illicit substances at age 15 years. By age 18, the adjusted hazard ratios remained significant except for alcohol. At age 21, the adjusted hazard ratios were significant only for cocaine, amphetamines, inhalants, and club drugs. A substantial portion of community subjects without CD never initiated illicit substance use. Clinical youth with CD demonstrated similar patterns, with comparatively larger adjusted hazard ratios. **Conclusions:** CD confers increased risk for substance use initiation across all substance classes at age 15 years, with greater relative risk for illicit substances compared to licit substances. This effect continues until age 18 years, with the weakest effect for alcohol. It further diminishes for other substances by age 21. However, the likelihood of initiating cocaine, amphetamines, inhalants and club drug use among those who have not initiated yet continues to be highly elevated by age 21. *J. Am. Acad. Child Adolesc. Psychiatry*, 2013;52(5):511–518. **Key Words:** conduct disorder, substance use disorders.

Initiation of substance use is the first step along a multi-step pathway that may eventually lead to the development of substance use disorders (SUD). Early age of initiation of substance use has been associated with a greater risk of eventually developing a SUD for alcohol, tobacco, and illicit substances.¹⁻⁹ The association between early age of onset of substance initiation and the later development of SUD has important theoretical as well as public health implications. There has been substantial debate over whether early age of substance initiation is a causal risk factor for developing later SUD or whether it acts as

a marker for correlated factors that confer the risk for developing SUD.³ Some researchers, primarily studying the influence of alcohol use on adolescents, have posited that early alcohol use alters adolescent brain development and developmental trajectories.^{2,10-12} An alternative hypothesis has emphasized that early age of substance initiation is a noncausal risk factor for the later development of SUD that acts as a marker for a range of correlated adolescent problem behaviors, which themselves confer the risk for later SUD.^{4,13} These researchers have focused on the observation that adolescent antisocial behaviors, novelty seeking, and early initiation of substance use are highly correlated, and have emphasized that early substance use is a marker for correlated externalizing behaviors that confer risk for the development of SUD.¹⁴⁻¹⁶



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From a public health perspective, if early age of initiation is a causal risk factor for later development of SUD, an implication would be that delaying the onset of substance use could result in a reduction in the number of persons who eventually develop a SUD. If the alternative hypothesis is correct, that is, that age of initiation is a noncausal risk factor, this would imply that prevention programs may need to more broadly target a range of problematic adolescent behaviors, including antisocial behaviors, to reduce the development of SUD.

One class of problem behaviors consistently associated with early onset of substance use is conduct disorder (CD). CD is a syndrome characterized by aggressive behaviors, truancy, violating social norms, and lying (APA).¹⁷ Epidemiological studies have shown that youth with CD initiate substances early, and have elevated rates of substance use and SUD.^{18,19} National surveys of adult populations have consistently demonstrated that persons with adult antisocial personality disorder, which requires adolescent CD as a precursor, have high rates of SUD as well as more severe SUD.^{20,21} Most prospective studies examining the association between CD and substance use have focused on the initiation of commonly used substances, such as alcohol, tobacco, or marijuana.²²⁻²⁴ Population-based epidemiologic surveys of adolescents have demonstrated that by 12th grade, 71%, 42%, 43%, and 25% of adolescents have tried alcohol, cigarettes, marijuana, or another illicit substances during their lifetime.²⁵ Although CD has been associated with an earlier rate of initiation of substances, to our knowledge whether the effect of CD on initiation varies by substance class has not been examined. In particular, because CD is associated with a pattern of violating social norms, we hypothesized that youth with CD may be comparatively at greater risk for initiating substances that are illicit. Alcohol and tobacco, albeit illicit substances for underage youth, are frequently used by adolescents and are legal to use once persons become 21 and 18 years of age, respectively. Marijuana, although once considered illicit for all ages, is also commonly used; in 18 states marijuana is now available through a medical recommendation²⁶ and was recently legalized in two states for adult recreational consumption. Other illicit substances are experimented with by proportionally fewer adolescents.²⁵ The goals of this study were the following: to examine the

influence of CD on substance initiation, across substance classes; to explore whether CD is associated with an earlier age of initiation across all substances; and to examine whether CD conferred relatively greater hazards of initiating substances. We hypothesized that youth with CD would be more likely to have ever used a substance, to have a younger age of substance experimentation, and to have greater hazards for substance initiation at earlier ages compared with youth without CD, and that these hazard ratios would be comparatively greater for illicit as compared to licit substances.

METHOD

Sample

All subjects in this study were assessed at 2 time points, adolescence and young adulthood. Subjects were originally recruited from 3 sources: the Colorado Twin Registry (CTR; $n = 1,246$); a clinical sample of adolescents recruited from a treatment program for youth with serious conduct and substance problems ($n = 280$); and an additional community sample of adolescents ($n = 156$) who were, at baseline, matched to the clinical sample on age, race/ethnicity, gender, and ZIP code of residence. Follow-up rates for the CTR are 86.1%, for the clinical sample 68.7%, and for the matched community sample 70.6%. The CTR includes a Community Twin Sample, recruited through the Colorado Department of Public Health and Environment and Colorado school districts as well as a Longitudinal Twin Sample, recruited through the Colorado Department of Vital Statistics. For this study, 1 twin was randomly selected from each twin pair. The second wave of data collection for both clinical and community subjects was completed between 2002 and 2008. Details for the subjects recruited from treatment for substance use disorders and the community sample have been described in detail elsewhere.²⁷

These samples were divided into 3 groups: community subjects (from either the twin registry or the additional community sample) who did not meet criteria for CD at either wave 1 or wave 2 ($n = 1,165$); community subjects who met the criteria for CD at either wave 1 or wave 2 ($n = 194$); and clinical subjects who met the criteria for CD at either wave 1 or wave 2 ($n = 268$).

Measures

For this study, self-report CD was used. Participants were considered to have a CD diagnosis if they endorsed three or more adolescent symptoms of CD reported concurrently (i.e., queried in adolescence) or retrospectively (i.e., queried in young adulthood). We used this approach because some subjects may have developed CD after the initial assessment. During

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