Addictive Behaviors 50 (2015) 144–148

Contents lists available at ScienceDirect

Addictive Behaviors

Short Communication

Separate dimensions of anxiety differentially predict alcohol use among male juvenile offenders

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HIGHLIGHTS

- The role of anxiety as a contributor to adolescent alcohol use remains unclear
- The current study examined worry and physiological anxiety symptoms as predictors of alcohol use
- Physiological symptoms of anxiety were associated with increased risk for alcohol use
- Worry symptoms were found to be protective against alcohol use
- Future research should consider the multidimensional nature of anxiety when assessing alcohol use risk

ARTICLE INFO

Article history:
Received 15 November 2014
Received in revised form 27 May 2015
Accepted 6 June 2015
Available online 20 June 2015

Keywords:
Anxiety
Alcohol
Internalizing symptoms
Binge drinking
Substance use
Juvenile offenders

ABSTRACT

Introduction: Although research has documented robust prospective relationships between externalizing symptomatology and subsequent adolescent alcohol use, the extent to which internalizing symptoms such as anxiety may increase risk for alcohol consumption remains controversial. Recent evidence suggests that one possible reason for mixed findings is that separate dimensions of anxiety differentially confer risk for alcohol use. The present study tested two dimensions of anxiety, worry and physiological anxiety symptoms, as predictors of alcohol use and misuse in a longitudinal sample of juvenile offenders.
Methods: Participants were 818 male juvenile offenders drawn from a larger multi-site, longitudinal study. Zero-inflated Poisson regression models estimated the influence of anxiety symptoms on typical drinking quantity, frequency of binge drinking, and alcohol dependence symptoms.
Results: Results indicate that physiological anxiety and worry symptoms showed differential relations with alcohol use risk. Physiological anxiety was positively associated with increased risk for typical alcohol involvement, frequency of binge drinking, and alcohol dependence symptoms, whereas worry was negatively associated with all alcohol use outcomes.
Conclusions: Current findings underscore the importance of considering anxiety as a multidimensional construct when examining the prospective relation between anxiety and adolescent alcohol use risk.

1. Introduction

Research has documented robust prospective relationships between externalizing symptomatology and adolescent alcohol use (Chassin, Hussong, & Beltran, 2004; King, Iacono, & McGue, 2004; Tarter, 2002). However, the extent to which internalizing symptomatology increases risk for adolescent alcohol use remains unclear (Colder et al., 2013; Hussong, Jones, Stein, Baucom, & Boeding, 2011; Costello, Erkanli, Federman, & Angold, 1999). In particular, there is mixed evidence about the role of anxiety as a contributor to adolescent alcohol use over and above the effects of co-occurring externalizing and conduct problems (Hussong & Chassin, 1994; Hussong, Curran, & Chassin, 1998; Kaplow, Curran, Angold, & Costello, 2001; Pardini, White, & Stouthamer-Loeber, 2007).

Accumulating evidence suggests that one reason for these equivocal results is that different dimensions of anxiety may be associated with alcohol use in divergent ways (Ciesla, Dickson, Anderson, & Neal, 2011; Kaplow et al., 2001). However, few studies have attempted to disaggregate the roles of different dimensions of anxiety and examine their respective associations with alcohol use in a prospective design.

The present study examined the relations between two dimensions of anxiety, worry and physiological symptoms, with alcohol use outcomes in a high-risk sample of juvenile offenders. Although juvenile offenders are often regarded as a highly and perhaps purely externalizing group, research reveals that these youth also report high rates of internalizing problems (Teplin, Abram, McClelland, Dulcan, & Mericle, 2002).

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http://dx.doi.org/10.1016/j.addbeh.2015.06.031
0306-4603/

Thus, this population represents a high-risk group for examining the roles of different dimensions of anxiety symptoms in alcohol use risk. Indeed, by examining internalizing symptoms among a sample that has high levels of externalizing behavior, it may be easier to reveal the effects of the internalizing symptoms because to some extent externalizing symptoms may be controlled. To this end, the current study employed a measure of lifetime involvement in criminal behaviors as a means to control for the extent of externalizing behavior.

2. Methods

2.1. Participants

Participants were from a larger multi-site, longitudinal study of adjudicated serious juvenile offenders (the Pathways to Desistance Project, Mulvey, 2004). The current sub-sample were 818 male juvenile offenders between age 14 and 19. Analyses utilized data from the first two time-point interviews, including the baseline interview (Wave 1) and the first follow-up interview (Wave 2), which occurred six months after baseline. Details of recruitment procedures and sample biases and representativeness are reported elsewhere (Schubert et al., 2004). Participants had to meet the following inclusion criteria: (1) completed the Revised Children's Manifest Anxiety Scale (RCMAS) at Wave 1; (2) self-reported alcohol use measures at Wave 1 and Wave 2; (3) self-identified as either non-Hispanic Caucasian, Hispanic, or African–American (a total of 3.5% of the sample self-identifying as "Other" race/ethnicity were dropped due to too few participants in any one category for meaningful comparison); (4) not been held in supervised settings (e.g., jail, detention) for the entirety of the period between Wave 1 and Wave 2 (to allow some opportunity for alcohol use). At Wave 1, the mean age of participants was 16.0 (SD = 1.17) and 16.51 for Wave 2 (SD = 1.18). The sample consisted of 23.1% identifying as non-Hispanic Caucasian, 35.6% Hispanic, and 41.3% African–American.

2.2. Measures

2.2.1. Worry

Adolescents self-reported symptoms of worry using the 11-item Worry/Oversensitivity subscale from the RCMAS (Reynolds & Richmond, 1997). The RCMAS uses dichotomous (e.g., yes/no) items, which are summed to form total subscale scores, with higher scores indicating higher levels of worry ($\alpha = .81$). The RCMAS has high internal consistency, good test–retest reliability, and high correlations with other anxiety measures (Reynolds & Richmond, 1997). Sample items are "I worry a lot of the time" and "I get nervous when things do not go the right way for me". Participants reported a mean of 3.71 worry symptoms (SD = 2.84).

2.2.2. Physiological anxiety

Adolescents self-reported symptoms of physiological anxiety using the 10-item Physiological Anxiety subscale of the Revised Children's Manifest Anxiety Scale (RCMAS). Sample items are "My hands often feel sweaty" and "Often I feel sick in my stomach". Physiological anxiety subscale scores were summed, with higher scores indicating higher levels of physiological anxiety ($\alpha = .66$). Participants reported a mean of 3.12 symptoms of physiological anxiety (SD = 2.16).

2.2.3. Alcohol use and dependence measures

Typical quantity of drinking was assessed using an item asking how many drinks participants typically drank when they engaged in alcohol use. Frequency of binge drinking was assessed by an item asking how many times youth had drunk five or more drinks at one time during the past six months, in alignment with the standardized definition of binge drinking for males proposed by the National Institute on Alcohol Abuse and Alcoholism (NIAAA, 2004). Response options included 1 = not at all, 2 = 1–2 times, 3 = less than one time per month, 4 = once per month, 5 = 2–3 times per month, 6 = once per week, 7 = 2–3 times per week, 8 = 4–5 times per week, 9 = everyday. Alcohol dependence symptoms were assessed as the count of DSM-IV dependence symptoms experienced during the past six months, with higher scores indicating higher levels of dependence. At Wave 1, participants reported a mean of 3.95 (SD = 6.41) drinks per occasion, a score of 2.37 (SD = 2.23) for frequency of binge drinking (reflecting less than monthly binge drinking), and .73 (SD = 1.61) alcohol dependence symptoms. Moreover, 80.8% of participants reported some lifetime alcohol use, with 53.2% drinking in the past six months. A zero-inflated Poisson regression model was employed to account for the non-normality of the distribution given the significant proportion of observations for these substance use count measures clustered around zero (Coxe, West, & Aiken, 2009).

2.2.4. Proportion of supervised time

Between Wave 1 and Wave 2, some participants were sentenced to supervised facilities (e.g., juvenile detention, residential treatment), which influences the opportunity to engage in alcohol use. The current analyses accounted for restricted opportunity using an item measuring proportion of supervised time (PST) that participants spent in settings with no community access (see Piquero et al., 2001).

PST was calculated as the number of days spent in a supervised setting divided by the total number of days between the Wave 1 and Wave 2 interviews. This was transformed into a proportion score from 0 to <1 (participants with scores of 1 were excluded). The mean PST score was .38 (SD = .40), with 38.1% ($n = 312$) of participants reporting no restriction of community access.

2.2.5. Lifetime non-drug related self-reported offending (SRO)

Lifetime involvement in non-drug related illegal activities was measured using an adaptation of the Self-Report of Offending Scale (SRO; Huizinga, Esbensen, & Weiher, 1994). The current analyses employed a lifetime versus time-limited measure of criminal offending because this measure is less affected by the effects of recent incarceration and therefore is likely a better indicator of overall externalizing severity. Self-reported offending measures have been shown to have concurrent validity with official court arrest data (Curry, 2000; Maxfield, Weiler, & Widom, 2000). The SRO consists of 22 yes-or-no items that measure lifetime involvement in different types of crime behaviors (e.g., initiating a fight, starting a fire, stealing a car). A non-drug related offending proportion score was calculated for each participant by dividing the number of non-drug related offenses endorsed by the total number of non-drug offending items (Knight, Little, Losoya, & Mulvey, 2004). Higher SRO scores indicated participation in more types of delinquent behavior ($\alpha = .88$). At Wave 1, participants reported a mean SRO score of .29 (SD = .19).

2.3. Statistical analyses

Zero-inflated Poisson regression analyses were conducted in MPLUS v5.1 (Muthén & Muthén, 2008) using RCMAS Physiological Anxiety and Worry/Oversensitivity as predictors and typical quantity, frequency of binge drinking, and alcohol dependence symptoms as outcome measures, with race/ethnicity, the Wave 1 alcohol use measure, self-reported offending, and PST as covariates. Predictor variables were centered as outlined in Cohen, Cohen, West, and Aiken (2013). Interactions between each predictor and covariate were tested in preliminary models and retained in final models if they reached significance. Multicollinearity diagnostics indicated that multicollinearity was not problematic (cut-offs suggested by Aiken and West (1991)).