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The Role of Age and Setting in Adolescents' First Drinking Experience for Predicting College Problem Drinking

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Abstract

Purpose—The purpose of this study was to determine the reliability of longitudinally reporting age at first drink (AFD), and to test AFD and setting of first drink (SFD) as predictors of collegiate problem drinking.

Participants—338 first-year college students were interviewed multiple times during their first academic year, from May 2011 through August 2012.

Methods—AFD, SFD, and problem drinking were measured using the Alcohol Use Disorders Identification Test (AUDIT) during the first year of college. Bivariate analysis and parsimonious multivariate linear regression model were conducted.

Results—62% of respondents were inconsistent in reporting AFD over time. Social SFD was the strongest independent predictor for higher AUDIT scores ($b=4.74$, 95% CI: 1.91, 7.57; $p=.002$).

Conclusions—Findings suggest caution should be used in relying upon using AFD as a sole predictor of problem drinking. SFD may be a complementary measure to identify students at high-risk for collegiate problem drinking.

Keywords

Alcohol; Clinical Medicine; Health Education; Community Health

Problem drinking among college students has long been recognized as a public health concern. In 2014, 60% of college students were current drinkers, over one-third were binge drinkers, and almost 14% were heavy drinkers.¹ Alcohol use has been linked with a variety of negative health consequences including assault, injury, accidents and death.^{2,3} Given the

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burden of problem alcohol use among the college population, it is essential to understand high-risk predictors of problem drinking.

Frameworks to understanding and predicting problem alcohol use are important in conceptualizing this behavior. Based on the premise that behaviors are predicted by intentions, which in turn are predicted by attitudes and beliefs, the Theory of Reasoned Action (TRA) is one model that is well-established in helping researchers understand problem alcohol use.^{4,5} When applied to alcohol consumption, the TRA emphasizes the importance of attitudes toward alcohol as well as social norms to motivate alcohol intentions and behaviors.^{4,5}

One well-studied predictor of problem alcohol use is age at first drink (AFD). Earlier AFD, such as early adolescence, has been identified as a strong predictor for increased risk of future alcohol dependency,^{6–15} increased risk of driving-under-the-influence violations,^{9,16} unsafe sexual experiences,¹⁷ as well as substance use/abuse.^{18,19} Screening for AFD typically involves asking college students when they had their first full drink of alcohol.^{6–12} However, little is known about the reliability of this measure over time.

In addition to AFD, setting of first drink (SFD) is a complex and poorly understood factor in predicting future problem drinking. SFD may include social settings such as with friends or at a party, or family settings such as with parents or at family events. To better understand the context of the first drinking experience, Kaynak et al. performed an extensive review of the literature to identify the effects that direct and indirect parental provision of alcohol may have on an underage adolescent's alcohol use.²⁰ Several studies demonstrated that parental provision of alcohol may mitigate short term alcohol-related risks.^{21–25} Others showed increased risk with parental provision of alcohol.^{26,27} No study assessed alcohol use disorders or the relationship between AFD and SFD on future drinking behaviors.

There are several knowledge gaps in our understanding of early drinking experiences and their impact on future drinking behaviors. First, the longitudinal reliability of reported AFD is unclear. Second, the influence of SFD on alcohol use disorders is not clear. Third, the relationship between AFD and SFD is poorly understood as they have rarely been assessed simultaneously. Thus, the purpose of this study was to determine the reliability of AFD reporting over time, and to test AFD and SFD as predictors of collegiate problem drinking alongside known risk factors.

Methods

Setting

This study used data from a larger longitudinal study. The parent study was designed to examine the relationship between social media and substance use among college students. For the parent study, we recruited incoming first-year students from 2 large public universities to conduct interviews and evaluate connections via social media. Data were collected between May 15, 2011 and August 5, 2012. Approval was obtained from the Institutional Review Boards of both institutions.

Participants

Inclusion criteria for the parent study included age 17 – 19 years, enrollment as a full time first-year student at either institution, English speaking, and owner of a Facebook account. Participants were randomly selected from the registrar's list of first-year students and recruited via mail, e-mails, phone calls and Facebook messages. Oral participant/parent consent and/or participant assent was obtained.

Phone Interviews

All participants completed baseline phone interviews during the summer preceding their first year of college. As part of the parent study, each participant's Facebook profile was evaluated every four weeks for displayed alcohol-related content using a validated procedure.^{28,29} Up to two prompted phone interviews were conducted if a new alcohol-related display was identified on the participant's Facebook page. This approach was designed to identify college students who displayed alcohol-related content and may be at higher-risk regarding alcohol use.^{28,29} Interviews were conducted by trained staff and data were recorded using a FileMaker database.

Measurements

In the parent study, the Theory of Reasoned Action (TRA) was used as the conceptual framework in selecting variables and developing the methodology. For this study, independent variables included AFD and SFD. Dependent variables included current drinking status and problem drinking measured by the Alcohol Use Disorders Identification Test (AUDIT).^{30,31} Covariates included measurements from the TRA, including attitude, normative beliefs and intentions towards alcohol use. Phone interviews assessed students' normative beliefs, attitudes, intentions, and behaviors toward alcohol based on a series of validated self-report scales.

AFD and SFD—AFD was assessed during each interview with the question, “At what age did you have your first drink containing alcohol?”^{6–12} AFD discrepancy was defined as providing different ages for AFD at various interviews with the baseline interview used as the referent category. SFD was defined as “social” or “family. Preliminary analysis of SFD was conducted by 2 study team members in an iterative approach. Findings illustrated that SFD could be reliably categorized as “social” or “family” based on participant descriptions so these categories were applied. Because of small numbers in the category of first drink alone, we decided to include these participants in the category “social” because this experience was not in the presence of family members.

Alcohol use—Current alcohol use was assessed by asking participants whether they had used alcohol in the past 28 days. For those who reported current alcohol use, the TimeLine Follow Back (TLFB) method was used to assess quantity and frequency.³² During this validated procedure,³³ the interviewer reviews each of the past 28 days to assess the quantity of standard alcoholic drinks consumed. This approach has been used successfully among college students,³⁴ groups,³⁵ adults³⁶, with English speakers,³³ and by telephone.³⁷

Problem alcohol use—The AUDIT is a 10 question scale with most answers on a 0-4 Likert scale assessing consumption, dependence and harm/consequences of alcohol use. It has been validated multiple times,^{38,39} including among college students.^{30,31,40} It is highly reliable⁴¹ with a Cronbach's alpha coefficient of 0.86.³⁹ Questions assess the frequency of drinking alcohol and binge drinking as well as negative consequences of alcohol use. AUDIT scores can theoretically range from 0 to 40; a score ≥ 8 indicates the person is at risk for problem drinking.³⁰ A commonly-used clinical scoring guideline was used: scores of 8-12 (for females) and 8-14 (for males) were considered indicative of hazardous drinking and scores ≥ 13 (for females) or 15 (for males) signified potential alcohol dependence.⁴²

Covariables—Based on previous work,⁴³⁻⁴⁵ attitude was measured with the question, "On a scale between 0 and 6, with 0 as very negative, 3 as neutral and 6 as very positive, what would you say your own attitude towards alcohol is?" Perceptions of drinking norms were measured in reference to participants' friends, as the proximity of this reference group renders it more influential than distal reference groups such as typical college students.⁴⁶ To assess injunctive norms, participants were asked, "What percentage of your friends approve of the use of alcohol?" Descriptive norms were measured by asking participants, "What percentage of your friends use alcohol currently?"

Demographic information, including gender, race/ethnicity, university, urbanicity of home location were obtained during the baseline interview. Categorization of urbanicity was determined using data the United States Department of Agriculture Rural-Urban Continuum Codes.⁴⁷

Analysis

Data analysis was conducted using STATA software version "12" (STATA, Cary, NC). All p values were 2-sided, and $p < .05$ was used to indicate statistical significance. Bivariate and subsequent parsimonious multivariate linear regression analysis was performed to identify independent predictors of higher AUDIT scores. All demographic characteristics and covariates were included initially in the bivariate analysis and those with p values < 0.2 were included in the multivariate analysis to create a parsimonious model. Gender, race/ethnicity, university, urbanicity of home location, SFD, attitude toward drinking, percent of friends who drink, current drinker status, and AFD, were included in the multivariate linear regression model.

Results

Of 338 participants who consented, enrolled, and provided baseline interviews, slightly over half were female, most were of white race/ethnicity, almost all were from urban counties, and over half of participants reported social SFD (Table 1). Sixty-two percent of respondents were inconsistent in reporting AFD over time. Males were less likely than females to provide inconsistent responses for AFD ($b = 0.14$; 95% CI 0.02, 0.26; $p = .02$). There was no association between AFD discrepancy and higher AUDIT scores.

Multivariate linear regression modeling demonstrated that social SFD ($b = 4.74$; 95% CI 1.92, 7.57; $p = .002$) and percent of friends who drink ($b = 0.04$; 95% CI 0.00035, 0.08; variance

0.61, $p=.048$) were independent predictors of higher AUDIT scores, although the association with social SFD was much stronger (Figure 1). All other covariates were not statistically significant as predictors of problem drinking. The interaction between AFD and SFD was also an independent predictor of higher AUDIT scores ($b=0.21$; 95% CI 0.03, 0.38, $p=.021$) (Figure 1).

Comment

The key finding of this study of college students from two universities was that 62% of respondents were inconsistent in reporting AFD over a one-year time period. Multivariate modeling showed social SFD was strongly predictive of collegiate problem drinking while AFD was not. However, this effect does not occur in isolation, and findings suggest an interaction between AFD and SFD that also independently predicted higher AUDIT scores. Further, the percentage of friends who drink was positively associated with social setting of first drink, illustrating how questions related to first drink setting can align and expand known risk factors from the TRA.

For decades, AFD has been a cornerstone in risk stratification of future problem drinking. To our knowledge, the longitudinal discrepancy with respect to AFD has not been reported previously. Our findings do not dispute the importance of AFD in predicting problem drinking. However, it does call into question the reliability of a one-time, cross-sectional AFD measurement. Approximately one-third of respondents initially reported an older AFD than they did at subsequent interviews. It is possible that despite efforts to minimize respondent bias and perception of judgment, participants falsely reported higher AFDs initially. Clinicians who use AFD to screen patients should ensure the neutrality of their reaction to responses to try to minimize erroneous self-reporting. The limitations of a one-time AFD measurement should be considered, and complementary assessments, such as AUDIT, may be used in conjunction with AFD to increase the accuracy of assessing problem alcohol use.

Our findings demonstrate that SFD was the strongest predictor of higher AUDIT scores. The interaction between AFD and SFD found in this study is consistent with prior work that stresses the importance of the relationship between the parent figures and adolescent with regard to alcohol drinking behavior.^{24–26} Our study considered the social and family settings regardless of the provider of alcohol, and its effects on collegiate problem drinking. As demonstrated by the protective nature of the family SFD in our study, perhaps the potential benefit of parental provision of alcohol illustrated in previous studies derives more from parental figure modeling behavior and less to do with the actual alcohol distribution.

Limitations

There are several limitations for this study. First, as a self-report study, it is subject to recall and social desirability bias. We attempted to minimize these biases by using the validated TLFB method³² and by informing participants that a federal certificate of confidentiality was obtained for this study. Second, the sample is not representative of all colleges nor is it representative of younger adolescents or non-college students. Third, we did not ascertain who actually provided the first drink. Finally, because of low numbers of participants who

reported a first drink alone, these responses were categorized as “social” and were not able to be independently analyzed.

Conclusions

Despite these limitations, our study has important implications for clinicians and public health professionals. With over 60% of participants providing different responses to AFD over time, caution should be used in using this measure in isolation as a predictor of problem drinking. The social SFD may also be important in identifying college students at risk for problem drinking. Further prospective study is needed to confirm the findings of discrepancies in AFD self-reporting among a larger and more diverse population.

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Abbreviations

AFD	Age at first drink
SFD	Setting of first drink
AUDIT	Alcohol Use Disorders Identification Test
TLFB	TimeLine Follow Back

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Figure 1.
Multivariate Analysis of Predictors of the Alcohol Use Disorders Identification Test
Data Table for Figure 1

Variable	Beta Coefficient (95% Confidence Interval)	P-Value
Gender	0.99 (−3.07 1.09)	0.34
Race/Ethnicity	−0.67 (−3.76, 2.3)	0.67
University	−0.95 (−3.14, 1.24)	0.39
First Drink Setting	4.74 (1.92, 7.57)	.002
Attitude Toward Drinking	2.76 (−0.15, 5.67)	0.06
Percent of Friends Who Drink	0.04 (0.00035, 0.08)	0.048
Current Drinking Status	−1.49 (−4.49, 1.50)	0.32
AFD	−1.10 (−2.27, 0.08)	0.07

Table 1

Participant Demographic Characteristics; N=338 (%)

Gender	
Male	148 (43.8%)
Female	190 (56.2%)
University	
Midwest	199 (58.9%)
Northwest	139 (41.1%)
Urbanicity of Home Location	
Rural	26 (7.7%)
Urban	307 (90.8%)
Not Available	5 (1.5%)
Ethnicity	
Caucasian/White	254 (75.1%)
Asian	39 (11.5%)
Hispanic	12 (3.6%)
African American/Black	5 (1.5%)
East Indian	3 (0.9%)
Native American/Alaskan	2 (0.6%)
More Than One	21 (6.2%)
Other	2 (0.6%)