ORIGINAL PAPER

The Associations Between Drinking Motives and Alcohol-Related Consequences in Graduate Students from Universities in the United States

Faith Shank[1] · D.J. Angelone[1] · Meredith C. Jones[1]

Abstract

Many college students "mature out" of heavy drinking when they graduate. Yet, those who go onto graduate education report engaging in problematic drinking patterns. Drinking motives are one factor that uniquely predicts problematic drinking patterns in college students. Evidence suggests that these unique associations also generalize to individuals' post-college, specifically between drinking motives and specific alcohol-related consequences. However, no research to date has examined the association between drinking motives and alcohol-related consequences in graduate students. The current study aimed to examine the unique associations between drinking motives, and drinks per week and specific alcohol-related consequences. Participants included 330 graduate students from various universities in the United States, recruited through social media. The majority of participants were White (71.3%), 54.9% female identifying, with a mean age of 26. Results revealed that conformity motives were positively associated with drinks per week, self-control consequences, self-care consequences, risky consequences, academic/occupational consequences, and blackout consequences. Social motives were negatively associated with interpersonal consequences and academic/occupational consequences. Enhancement motives were negatively associated with drinks per week, and positively associated with academic/occupational consequences. However, coping motivation was not associated with any of the outcomes. These findings highlight the need to further understand how drinking motives influence specific types of alcohol-related consequences as these associations change post-college. Results can be used to better inform future prevention and interventions for this population.

Keywords Graduate students · Alcohol · Drinking motives · Alcohol-related consequences

On average, at least 25% of emerging adults (i.e., 18–25 years old) report alcohol consumption in the past month [1]. According to nationwide descriptive norms, 72–85% of graduate students report drinking alcohol in the past month, exceeding the nationwide drinking norms of adults [2]. More specifically, approximately 7% of graduate students report engaging in heavy drinking (i.e., 5+/4+ drinks on any day or 14+/7+ drinks per week for males/females) [3]. In short, there is evidence that graduate students engage in problematic drinking patterns, in which prevention and intervention efforts are needed. To better tailor and produce effective prevention and intervention strategies, it is necessary to better understand influences of problematic drinking patterns (i.e., heavy drinking, and high alcohol-related consequences).

Emerging adulthood is a time that is typically characterized by heavy drinking patterns, especially in college students [4]. One well established predictor of students engaging in heavier drinking patterns are drinking motives (i.e., enhancement, social, conformity, and coping) [5]. Specifically, drinking to cope is associated with higher levels of alcohol-related consequences, independent of the individual's alcohol use [5, 6]. On the other hand, drinking for enhancement has been associated with higher alcohol use and higher alcohol-related consequences [5]. For conformity and social drinking motives, the literature has been inconsistent in identifying their associations with alcohol use and alcohol-related consequences; however, there is

✉ Faith Shank
  shankf38@students.rowan.edu

1 Department of Psychology, Rowan University, 201 Mullica Hill Rd, Glassboro, NJ 08028, USA

some evidence suggesting those who drink for conformity reasons have higher alcohol-related consequences [5].

There are unique associations between drinking motives and specific alcohol-related consequences [7]. In particular, individuals who endorse high levels of conformity motivation have more alcohol-related consequences related to their self-care, self-perception, and impaired control. Those who endorse high levels of enhancement motivation have more alcohol-related consequences related to blackout drinking. These associations have been shown to be true for adolescence and college students; however, as students "mature out" of heavy drinking post-college, understanding these associations become stunted.

As noted, post-college, students tend to "mature out" of heavy drinking, causing a change in associations between drinking motives and drinking patterns (i.e., drinks per week, and alcohol-related consequences) [8]. For instance, when tracking college student drinkers until the age of 35, evidence showed there were decreases in endorsement of drinking to cope and in turn a decrease in alcohol-related consequences [9]. A decrease in problematic drinking may be due to changes in problem-solving and being able to manage negative emotions, such that individuals who do not increase skills in problem-solving and managing negative emotions are more likely to engage in drinking for coping motivation [9]. That said, graduate students who drink to cope with negative emotions drink more frequently, and those who drink for enhancement, coping or social reasons drink larger consumptions of alcohol [10]. Taken together, drinking motives are predictive of heavy drinking patterns in graduate students; however, there is a paucity of research examining the association between drinking motivation and alcohol-related consequences in graduate students.

To better understand these associations and potential implications, identifying unique associations between drinking motives and specific alcohol-related consequences is essential in informing future prevention and intervention work. For instance, examining undergraduate student behavior at a five year follow up (post-college), there are unique changes in association between motives and specific alcohol-related consequences [11]. Specifically, the association between coping motivation and interpersonal alcohol-related consequences has a stronger association post college, when compared to the association during college [11]. On the other hand, the association between drinking to cope and blackout alcohol-related consequences weakens over time [11].

Furthermore, there are changes in the association between other drinking motives and specific alcohol-related consequences from college to post college. More specifically, conformity motives positively predicted all specific alcohol-related consequences post college [11]. When comparing college and post college, all changes in associations between conformity motives and consequences were significant, except for interpersonal alcohol-related consequences [11]. As such, drinking to conform appears to be more problematic post college for emerging adults. Unfortunately, there is a lack of research examining associations between drinking motives, and alcohol use and specific alcohol related consequences in emerging adults who continue onto graduate school. Nonetheless, this data could inform future prevention and intervention efforts for emerging adults post college.

Current Study

Graduate students engage in problematic drinking patterns, with up to 25% of students reporting engagement in heavy drinking. To better inform prevention and intervention efforts, understanding predictors of problematic drinking problems is needed. Drinking motives have unique associations with drinking frequency and consumption as well as specific alcohol-related consequences. The aim of the current study is to explore the associations between drinking motives, drinking consumption, and specific alcohol-related consequences in graduate students.

Methods

Participants

Demographics. The study consisted of 330 participants who were enrolled in a graduate program from numerous universities nationwide in the United States. The mean age of the participants was 26.2 years old ($SD = 3.3$), and 54.9% female. A majority of the participants identified as White (71.3%), with 38.4% identifying as Latino/Latina, 20.7% Black, 4.9% Native American or Native Alaskan, 1.8% Asian, 0.3% Native Hawaiian or Pacific Islander, and 0.3% other. There was a wide variety of degree fields in this sample, with psychology (18.6%) being the most prevalent, followed by dentistry (12.2%), economics (9.1%), engineering (8.5%), English (7%), and law (6.1%). Participants were recruited by posts on social media platforms such as Facebook, Twitter and Reddit, and via a daily email announcement.

Measures

Alcohol use. To assess drinking behaviors, participants completed The Daily Drinking Questionnaire (DDQ) [12]. The DDQ consists of three questions that focus on how

much alcohol participants consume each day of the week (drinks per week), how many days they consume alcohol per week (i.e., frequency), and how many drinks they typically consume per drinking occasion (i.e., typical).

Alcohol-related problems. We used The Brief Young Adult Alcohol Consequences Questionnaire (BYAACQ) [13] to measure alcohol-related consequences, The BYAACQ contains 24 problems tailored to college students related to their drinking, and refer to the past month of drinking. Participants respond on a dichotomous (yes/no) scale. Subscales were identified corresponding to subscales from the original 48-item version (Read et al., 2006). Subscales that had at least three items on the brief scale were used, totaling at six subscales. Reliabilities for each subscale were: interpersonal (3 items; $\alpha = 0.53$), impaired control (3 items, $\alpha = 0.52$), poor self-care (3 items, $\alpha = 0.49$), risky behavior (4 items, $\alpha = 0.58$), academic/occupation (3 items, $\alpha = 0.57$), and blackout drinking (5 items, $\alpha = 0.53$). Example items include: "While drinking, I have said or done embarrassing things" (interpersonal), "I have spent too much time drinking" (impaired control), "I have been overweight because of drinking" (poor self-care), "I have driven a care when I knew I had too much to drink to drive safely" (risky behaviors), "The quality of my work or schoolwork has suffered because of my drinking (academic/occupational), and "I have passed out from drinking" (blackout drinking).

Drinking motives. We used the Drinking Motives Questionnaire (DMQ) [14] to assess participants' motivation for drinking, There are 20 items in the DMQ that assess four unique drinking motives: enhancement, social, conformity, and coping. Participants respond to each item on a 5-point Likert scale from 1 (Never/Almost Never) to 5 (Almost Always/Always). Each subscale was calculated by taking the mean of the corresponding items. Sample items and reliabilities for each motive are as follows: enhancement ($\alpha = .71$; "Because you like the feeling"), coping ($\alpha = .79$; "To forget your worries"), social ($\alpha = .68$; "Because it helps you enjoy a party") and conformity ($\alpha = .71$; Because your friends pressure you to drink").

Procedure

Eligibility criteria for the study included being 18 years of age or older and current enrollment in a graduate program in the United States. All participants completed the consent form and went through a Captcha security prompt prior to completing the baseline assessments. The baseline assessment included demographic information, questions about drinking patterns, and other health behaviors. Participants who accurately completed the check questions were compensated with a $20 Amazon e-gift card for completing the study. This study was approved by the Institutional Review Board of the first author's institution. Data were collected during the Fall of 2021.

Results

Data Cleaning & Planned Analyses

Data cleaning was conducted to ensure the reliability and validity of the data. Participants who did not complete at least two out of the three check questions were removed. Those whose reported an education level below a bachelor's degree were also removed. In addition, any outliers that were beyond +/- three standard deviations from the mean were winsorized (i.e., replaced by the third standard deviation value).

Descriptive Statistics

Descriptive statistics and bivariate correlations were computed in R Studio for all variables of interest and presented in Table 1. On average, graduate students reported drinking 8 drinks per week, and reported experiencing 7.7 alcohol-related consequences in the past month. The endorsement of drinking motives, on average, were some of the time to half of the time. Of note, all variables were positively associated with each other.

Drinking Motives Predicting Specific Alcohol-related Consequences

First, a negative binomial regression was used to explore how drinking motives predict drinks per week, while controlling for gender. As seen in Table 2, conformity motivation positively predicted drinks per week, and enhancement motivation negatively predicted drinks per week.

Next, six negative binomial regressions were used to explore the association between drinking motives and six specific alcohol-related consequences, while controlling for gender and drinks per week. The first regression demonstrated that social motivation negatively predicted interpersonal and academic/occupational consequences. Conformity motivation positively predicted self-control, self-care, risky, academic/occupational and blackout consequences. Finally, enhancement motivation positively predicted risky, academic/occupational consequences, and interpersonal consequences. To note, coping motivation did not significantly predict any of the specific alcohol-related consequences.

Table 1 Descriptive and bivariate correlations of all variables of interest (N=330)

	1	2	3	4	5	6	7	8	9	10	11
1. Drinks per week											
2. Social motivation	0.19**										
3. Coping motivation	0.28**	0.57**									
4. Enhancement motivation	0.15**	0.55**	0.58**								
5. Conformity motivation	0.23**	0.38**	0.41**	0.61**							
6. Interpersonal consequences	0.34**	0.17**	0.43**	0.40**	0.22**						
7. Self-control consequences	0.32**	0.23**	0.42**	0.27**	0.26**	0.47**					
8. Self-care consequences	0.18**	0.21**	0.26**	0.33**	0.44**	0.38**	0.37**				
9. Risky consequences	0.37**	0.28**	0.38**	0.38**	0.38**	0.44**	0.53**	0.60**			
10. Academic/occupational consequences	0.33**	0.13*	0.35**	0.33**	0.33**	0.67**	0.56**	0.46**	0.51**		
11. Blackout consequences	0.31**	0.30**	0.39**	0.34**	0.30**	0.47**	0.50**	0.50**	0.63**	0.58**	
12. Gender	0.28**	0.16**	0.21**	0.27**	0.11*	0.18**	0.03	0.27**	0.27**	0.12*	0.27**
M	8.05	2.80	2.56	2.64	2.72	0.93	1.02	0.98	1.25	0.95	1.82
SD	8.63	0.73	0.74	0.67	0.77	1.00	0.99	0.99	1.22	1.02	1.38

* $p < .05$

** $p < .01$

Discussion

We found unique associations between drinking motives and drinks per week, and between drinking motives and specific alcohol-related consequences in a graduate student sample. For instance, graduate students who engage in drinking for enhancement reasons drink less. This is inconsistent with findings that graduate students who engage in drinking for enhancement reasons consume larger quantities of alcohol [10]. One explanation is that graduate students may think they have to consume lower levels of alcohol to achieve their desired effects. In addition, graduate students who drink for enhancement reasons reported significantly more interpersonal, academic/occupational, and risky consequences. Graduate students who drink for enhancement reasons tend to drink in social situations and have higher risk for various alcohol-related consequences [6].

Additionally, there was a positive relationship between conformity motivation and drinks per week, such that those who drink for conformity reasons drink more. One explanation for this finding is that graduate students often find themselves in smaller cohorts and are pressured to engage in professional environment that include alcohol consumption (i.e., networking), resulting in graduate students drinking more often to conform within the expectations of those around them. Another potential explanation is that graduate students tend to be heterogenous in their cultural identities (e.g., age, marital status, race, socioeconomic status), compared to undergraduate students, suggesting graduate students have a poor sense of belonging in their program, and may increase their conformity motivation to fit in with those around them [15].

Thus, it was not surprising that graduate students who endorsed drinking for conformity reasons reported significantly more self-control, self-care, risky, academic/occupational, and blackout alcohol-related consequences. Our results are consistent with the evidence that conformity motivation has a unique positive association with specific alcohol-related consequences post college, and the notion that avoidance reasons for drinking put individuals at a higher risk for adverse consequences [5, 11]. It is possible that if those who endorse drinking for conformity reasons do not get their needs satisfied (i.e., sense of belonging), it could lead to more risky drinking and potential lead to problems in daily functioning and responsibilities.

Moreover, there was no association between graduate students who endorsed drinking for social reasons and drinks per week; however, those individuals had significantly fewer interpersonal and academic/occupational consequences compared to those who reported low social drinking motivation. One possible explanation is that drinking for social reasons may increase adaptive social interactions and increasing a graduate students' sense of belonging in a new environment, resulting in a reduction in risky behaviors that would typically lead to these specific types of alcohol-related consequences. This explanation is consistent with the understanding that those who are socially motivated to drink are less risky, potentially acting as a protective factor for problematic drinking patterns [5]. Of note, there were no significant associations between drinking to cope, and drinks per week and specific alcohol-related consequences.

Limitations

Although these results are novel and have important implications for prevention and intervention, no study is without limitations. First, the study employed a cross-sectional design, which limits the ability to assess changes over time.

Table 2 Negative binomial regressions for drinking motives predicting drinks per week and specific alcohol-related consequences (*N* = 330)

	Est.	*SE*	*t*	95% CI lower	95% CI upper
Drinks per week					
Cope	0.183	0.106	1.734	− 0.023	0.391
Conform	0.457	0.090	5.103	**0.283**	**0.634**
Social	0.020	0.091	0.219	− 0.159	0.196
Enhance	− 0.247	0.122	-2.023	**− 0.488**	**− 0.009**
Gender	0.572	0.111	5.153	0.356	0.792
Interpersonal Consequences					
Cope	0.168	0.107	1.569	− 0.040	0.379
Conform	0.132	0.094	1.410	− 0.050	0.317
Social	− 0.328	0.095	-3.433	**− 0.516**	**− 0.141**
Enhance	0.721	0.126	5.720	**0.474**	**0.969**
Gender	0.037	0.119	0.313	− 0.200	0.270
Drinks per week	0.017	0.005	3.302	0.006	0.026
Self-control Consequences					
Cope	0.252	0.105	1.190	− 0.090	0.376
Conform	0.352	0.091	3.870	**0.175**	**0.532**
Social	− 0.048	0.088	− 0.545	− 0.222	0.359
Enhance	0.122	0.121	1.009	− 0.116	0.359
Gender	− 0.194	0.114	-1.702	− 0.418	0.029
Drinks per week	0.016	0.005	3.247	0.006	0.025
Self-care Consequences					
Cope	0.102	0.113	0.910	− 0.117	0.325
Conform	0.521	0.098	5.302	**0.331**	**0.716**
Social	− 0.048	0.094	− 0.516	− 0.234	0.135
Enhance	0.142	0.130	1.091	− 0.114	0.396
Gender	0.078	0.121	0.641	− 0.160	0.315
Drinks per week	0.008	0.005	1.474	− 0.003	0.018
Risky Consequences					
Cope	0.132	0.107	1.227	− 0.078	0.346
Conform	0.414	0.095	4.363	**0.230**	**0.603**
Social	− 0.084	0.093	− 0.904	− 0.266	0.097
Enhance	0.304	0.126	2.398	**0.055**	**0.553**
Gender	0.179	0.119	1.503	− 0.054	0.413
Drinks per week	0.017	0.005	3.531	0.007	0.026
Academic/Occupational Consequences					
Cope	− 0.028	0.119	− 0.232	− 0.259	0.207
Conform	0.532	0.107	4.964	**0.325**	**0.745**
Social	− 0.322	0.101	-3.192	**− 0.521**	**− 0.125**
Enhance	0.516	0.140	3.684	**0.241**	**0.791**
Gender	0.082	0.131	0.625	− 0.175	0.339
Drinks per week	0.016	0.006	2.634	0.004	0.027
Blackout Consequences					
Cope	0.076	0.082	0.933	− 0.083	0.238
Conform	0.199	0.071	2.801	**0.061**	**0.340**
Social	0.064	0.071	0.900	− 0.076	0.203
Enhance	0.154	0.095	1.621	− 0.033	0.340
Gender	0.151	0.093	1.622	− 0.031	0.333
Drinks per week	0.011	0.004	2.824	0.003	0.019

To comprehensively examine alterations in drinking patterns during graduate education, it would be appropriate to utilize longitudinal assessments in future research. Second, the measure used to assess the specific alcohol-related consequences exhibited low reliability, which raises concerns about the accuracy and precision of the obtained data. This could be due to the study's reliance on self-reporting by the participants. Third, the sample was predominantly white graduate students, which restricts the generalizability of these findings to graduate students from more diverse backgrounds. Future research endeavors should encompass an evaluation of cultural variances in drinking patterns and inconsistencies among graduate students. Lastly, the data collection for this study occurred during the Fall of 2021, a period characterized by high levels of COVID-19. Therefore, the drinking patterns uncovered in this study might differ from pre-COVID-19 norms. To ensure accurate inferences, ongoing research should investigate graduate student drinking patterns.

Conclusion

The graduate student experience is unique, and it is crucial to examine graduate student drinking separately from undergraduate drinking patterns. Our results are consistent with this notion: we found unique associations between drinking motives and specific alcohol-related consequences. Future studies should aim to have a better understanding of problematic drinking patterns among graduate students by examining various factors that influence drinking motivation, and problematic drinking patterns to inform future interventions for this population.

Statements and Declarations

The authors have no relevant financial or non-financial interests to disclose.

The authors have no competing interests to declare that are relevant to the content of this article.

All authors certify that they have no affiliations with or involvement in any organization or entity with any financial interest or non-financial interest in the subject matter or materials discussed in this manuscript. The authors have no financial or proprietary interests in any material discussed in this article.

References

1. Substance Abuse and Mental Health Services Administration (2020). *Key Substance Use and Mental Health Indicators in the*

United States: Results from the 2020 National Survey on Drug Use and Health. 156.

2. American College Health Association (2019). *American College Health Association-National College Health Assessment II: Reference Group Executive Summary Spring 2019*

3. Allen, H. K., Lilly, F., Green, K. M., Zanjani, F., Vincent, K. B., & Arria, A. M. (2022). Substance use and mental health problems among graduate students: Individual and program-level correlates. *Journal of American College Health: J of ACH*, *70*(1), 65–73. https://doi.org/10.1080/07448481.2020.1725020.

4. White, A., & Hingson, R. (2013). The burden of alcohol use: Excessive alcohol consumption and related consequences among college students. *Alcohol Research: Current Reviews*, *35*(2), 201–218.

5. Cooper, M. L., Kuntsche, E., Levitt, A., Barber, L. L., & Wolf, S. (2016). Motivational models of substance use: A review of theory and research on motives for using alcohol, marijuana, and tobacco. *The Oxford Handbook of Substance Use and Substance Use Disorders*, *1*, 375–421. https://doi.org/10.1037/1040-3590.6.2.117.

6. Merrill, J. E., & Read, J. P. (2010). Motivational pathways to unique types of alcohol consequences. *Psychology of Addictive Behaviors*, *24*(4), 705–711. https://doi.org/10.1037/a0020135.

7. Merrill, J. E., Wardell, J. D., & Read, J. P. (2014). Drinking motives in the prospective prediction of unique alcohol-related consequences in college students. *Journal of Studies on Alcohol and Drugs*, *75*(1), 93–102. https://doi.org/10.15288/jsad.2014.75.93.

8. Jochman, K. A., & Fromme, K. (2009). Maturing out of substance use: The other side of etiology. In L. M. Scheier (Ed.), *Handbook of drug use etiology: Theory, methods, and empirical findings* (pp. 565–578). DC, American Psychological Association.

9. Littlefield, A. K., Sher, K. J., & Wood, P. K. (2010). Do changes in drinking motives mediate the relation between personality change and maturing out of problem drinking? *Journal of Abnormal Psychology*, *119*(1), 93. https://doi.org/10.1037/a0017512.

10. Allen, H. K., Barrall, A. L., Beck, K. H., Vincent, K. B., & Arria, A. M. (2020). Situational context and motives of alcohol use among graduate student drinkers. *Addictive Behaviors*, *104*, 106267. https://doi.org/10.1016/j.addbeh.2019.106267.

11. Shank, F., Armeli, S., Hamilton, H. R., & Tennen, H. (2020). Post-college changes in the association between drinking motives and drinking-related problems. *Addictive Behaviors*, *111*, 106568. https://doi.org/10.1016/j.addbeh.2020.106568.

12. Collins, S. E., & Spelman, P. J. (2013). Associations of descriptive and reflective injunctive norms with risky college drinking. *Psychology of Addictive Behaviors: Journal of the Society of Psychologists in Addictive Behaviors*, *27*(4), 1175–1181. https://doi.org/10.1037/a0032828.

13. Kahler, C. W., Strong, D. R., & Read, J. P. (2005). Toward efficient and comprehensive measurement of the alcohol problems continuum in college students: The brief Young Adult Alcohol Consequences Questionnaire. *Alcoholism: Clinical and Experimental Research*, *29*(7), 1180–1189. https://doi.org/10.1097/01.alc.0000171940.95813.a5.

14. Cooper, M. L. (1994). Motivations for alcohol use among adolescents: Development and validation of a four-factor model. *Psychological Assessment*, *6*(2), 117–128. https://doi.org/10.1037/1040-3590.6.2.117.

15. Lambert, N. M., Stillman, T. F., Hicks, J. A., Kamble, S., Baumeister, R. F., & Fincham, F. D. (2013). To belong is to matter: Sense of belonging enhances meaning in life. Personality *and Social Psychology Bulletin*, *39*(11), 1418–1427.