ALCOHOL CONSUMPTION AND ACADEMIC RETENTION IN FIRST-YEAR COLLEGE STUDENTS

DR. GARY LIGUORI
University of Tennessee Chattanooga

BARB LONBAKEN, PHD
North Dakota State University

Objectives: This study attempted to identify relationships between alcohol consumption and first-to-second-year student retention among college students.

Methods: 820 students in general education courses completed an online wellness assessment at four separate time points, including questions related to alcohol consumption. Data were analyzed with PAWS, and alpha set at $p \leq .05$.

Results: Male students reported higher rates of drinking and heavy episodic drinking compared to females. Male students also had a significantly higher risk of lower retention associated with both social drinking and heavy episodic drinking compared to female students.

Conclusions: Social drinking and heavy episodic drinking were both associated with decreased retention in male students, thereby extending the scope of academic problems associated with student drinking.

Key words: Social drinking; heavy episodic drinking; Student retention

Alcohol use among college students is an issue of concern on many U.S. college campuses (National Institute on Alcohol Abuse and Alcoholism, 2010). National surveys have indicated that approximately two-thirds of college students report drinking alcohol in the past month, and more than one-third reported heavy episodic drinking (HED), defined as five or more drinks in one sitting, in the previous two weeks (Monitoring the Future, 2010; SIUC/Core Institute, 2008; Substance Abuse and Mental Health Services Administration, 2008). Higher rates of alcohol use, HED, and heavy alcohol use among full-time college students, compared with rates for others aged 18 to 22, has remained consistent since 2002 (Substance Abuse and Mental Health Services Administration, 2008).

Demographic differences are one factor that influence college student drinking behaviors (Ingle & Furnham, 1996) along with the size of the student body, geographical location, and the importance of athletics on campus (Nelson & Wechsler, 2001). Freshmen, or first-year students, are at particular risk for problematic drinking and its associated consequences, compared to upper division students, largely due to a new sociocultural context that includes decreased adult supervision and ready access to alcohol on campus (Del Boca, Dirkes, Greenbaum, & Goldman, 2004). For example, freshmen have been found to drink more frequently and in greater quantity than upperclassmen (Leeman & Wapner, 2001) as well as heavy episodic drink and drink to intoxication more frequently

than their counterparts (Vaughan, Corbin, & Fromme, 2009). In addition, drinking beliefs (i.e., normative influences) influence drinking habits and these influences tend to be strongest during the first year of college (Turrisi, Padilla, & Wiersma, 2000).

The associated consequences of alcohol consumption vary and include academic difficulties, psychosocial problems, antisocial behaviors, injuries, and other risk taking behaviors (Attwood, Ataya, Benton, Penton-Voak, & Munafo, 2009; Wechsler, Lee, Kuo, & Lee, 2000). Much has been written about the educational difficulties and academic consequences associated with alcohol use, including missing a class and getting behind in school work (Wechsler, & Nelson, 2008); performing poorly on a test or project (Perkins, 2002; Presley & Pimentel, 2006); and experiencing a lower grade point average (Pritchard & Wilson, 2003; Singleton, 2007). While a relationship between college academic achievement and retention has been established (McGrath & Braunstein, 1997), research on the association between alcohol use in first-year students and retention is limited.

Given the consequence of academic impairment associated with problematic drinking, alcohol misuse may contribute significantly to failure and dropout rates (Perkins, 2002), many students who drop out may have experienced alcohol-related academic problems leading to the drop out (Wood, Sher, Erickson, & DeBord, 1997). Also, students dependent on alcohol have been found to be more likely to fail in their first year than those who did not report drinking problems (Aertgeerts & Buntinx, 2002). Moreover, alcohol abuse has been found to affect retention directly (i.e., accidents), as well as indirectly (i.e., problematic academic performance) (Wyman, 1997).

Heavy episodic drinking, when controlling for other variables (i.e., social support, coping), has not been found to be related to retention (DeBerard, Spielmans, & Julka, 2004). In contrast, risky HED styles and experiences of negative effects have predicted or contributed to alcohol dependence and abuse, in conjunction with academic attrition and early departure from college (Jennison, 2004). In addressing the scope of the alcohol problem on campuses, The Higher Education Center for Alcohol and Other Drug Abuse and Violence Prevention (2009) indicated that problematic drinking can have a negative effect on an institution, including reducing retention rates.

Despite the fact that the majority of first-year students on college campuses engage in some type of drinking behavior (Engs, Diebold, & Hanson, 1996), little is known about retention rates into their second year. Therefore, the purpose of this study was twofold. The first objective was to analyze descriptive data on college students, including first-year students, in relation to their drinking patterns, including social drinking and HED. The second objective was to assess if any evidence exists that may suggest alcohol consumption has an impact on first-year to second-year student retention. Through these objectives, this study will fill a void in the literature by correlating alcohol drinking to retention.

Methods

Sample

The sample for this study consisted of undergraduate students enrolled in two separate university required general education courses at a Midwestern university. The convenience sample of 820 students (531 male, 289 female, 59.3% freshmen, 19.37 ± 2.99 years) completed a comprehensive wellness assessment at four different times (T1, T2, T3, T4) during the fall semester 2009. The assessment included a 32-question wellness survey, with specific questions related to drinking patterns, lifestyle factors (i.e.,

screen time, physical activity, sleep), and demographics. Students who participated signed a consent form allowing their data to be used for research in accordance with Institutional Review Board policies.

Instrumentation

Drinking patterns were assessed via two questions, the uses of which are consistent with standard practice in research on alcohol use among this population (American College Health Association – National College Health Assessment II, 2010; SIUC/Core Institute. 2008). The first question was an open-ended question that asked "The last time you partied/socialized, how many drinks of alcohol did you have?" The second question asked "Over the last two weeks, how many times have you had five or more drinks of alcohol at one sitting?" Response choices ranged from none/zero to ten or more times.

Analyses

Analyses were completed using the Predictive Analytics Software (PASW) for Windows, Version 18.0. Descriptive statistics were used to compute various demographic variables, as well as to assess the quantity of alcohol consumed and the frequency of HED. Independent sample t tests were used to examine differences in the drinking and HED means between the genders and age groups (i.e., < 21 years and ≥ 21 years) within the sample. Levels of significance were set at $p \leq .05$. Analysis of variance (ANOVA) was used to examine differences between the number of drinks and HED episodes at the four time points. In addition, ANOVA was used to examine differences in the number of drinks and HED episodes by gender. Logistic regression was used to assess the impact of drinking and HED on retention of first-year students into the second year.

Results

Descriptive Data

Descriptive statistics of the sample by gender are presented in Table 1. The lowest percentage of students who reported drinking was first-year students. The highest percentage of drinkers was male students ≥ 21 years of age. Similarly, the percentage of first-year students reporting HED was the lowest in the sample, with the highest percentage of heavy episodic drinkers being among male students ≥ 21 years of age. Female students reported drinking more than male students in two areas. A higher percentage of females < 21 years of age reported drinking than did males < 21 years of age and female students < 21 years of age also reported slightly more HED episodes than did male students < 21 years of age.

Drinking patterns by age, class, and gender are presented in Table 2. Analyses of the data on number of drinks at each separate time point for the entire sample revealed an overall effect of time ($p = .020$), with a significant difference between T2 and T4 ($p = .048$) and T3 and T4 ($p = .005$). Significant gender differences were reported at each time point among all students, with male students reporting drinking significantly more than female students (T1, $p < .001$; T2, $p < .001$; T3, $p = .002$; T4, $p = .001$).

Among students ≥ 21 years of age, significant gender differences in drinking were reported at T4, only ($p = .045$). However, male students reported drinking more than female students at all four time points. In students < 21 years of age, significant gender differences were reported at every time point with males drinking significantly more than females (T1, $p < .001$; T2, $p = .001$; T3, $p = .004$; T4, $p = .003$).

Significantly more alcohol drinking was reported at T1 ($p = .006$) and T2 ($p = .041$) for students ≥ 21 years compared to students < 21 years. However, students ≥ 21 years reported drinking more than students < 21 years at all four time points.

Table 1. Descriptive Statistics of Students and Drinking Patterns by Gender

Vari-able	N	Age	1st Yr Drink	< 21 Yrs Drink	≥ 21 Yrs Drink	All Drink	1st Yr Heavy episodic	< 21 Yrs Heavy episodic	≥ 21 Yrs Heavy episodic	All Heavy episodic
Males	531	19.37(±2.63)	59.9%	60.6%	78.1%	63.7%	52.4%	54.0%	68.3%	56.5%
Females	289	19.37(±3.56)	55.9%	64.0%	63.9%	59.9%	41.3%	54.6%	50.5%	46.4%
Total	820	19.37(±2.99)	58.4%	61.8%	73.5%	62.3%	48.4%	54.2%	62.5%	52.9%

Table 2. Mean Number of Drinks by Age, Class Category, and Gender

Variable	T1	T2	T3	T4
All Students	3.12 ± 5.39	2.92 ± 5.35	2.87 ± 4.63	3.22 ± 5.11
- Males	3.68 ± 6.09	3.43 ± 6.25	3.25 ± 5.09	3.68 ± 5.31
- Females	2.10 ± 3.55	2.00 ± 2.84	2.18 ± 3.53	2.38 ± 4.62
Students ≥ 21 years	4.30 ± 6.61	3.78 ± 3.79	3.20 ± 3.42	3.59 ± 3.51
- Males	4.83 ± 7.57	4.16 ± 3.94	3.47 ± 3.58	3.99 ± 3.80
- Females	3.21 ± 3.77	2.98 ± 3.37	2.63 ± 2.99	2.74 ± 2.64
Students < 21 years	2.89 ± 5.10	2.75 ± 5.60	2.80 ± 4.84	3.14 ± 5.39
- Males	3.44 ± 5.73	3.27 ± 6.63	3.20 ± 5.37	3.61 ± 5.59
- Females	1.90 ± 3.48	1.82 ± 2.71	2.09 ± 3.62	2.31 ± 4.92
1st year Students	2.75 ± 5.29	2.70 ± 6.20	2.71 ± 5.16	3.13 ± 5.80
- Males	3.28 ± 6.24	3.20 ± 7.45	3.07 ± 5.74	3.44 ± 5.94
- Females	1.83 ± 2.82	1.84 ± 2.83	2.09 ± 3.90	2.59 ± 5.52

Table 3. Mean Number of HED Episodes by Age, Class Category, and Gender

Variable	T1	T2	T3	T4
All Students	.80 ± 1.38	.76 ± 1.26	.79 ± 1.38	.77 ± 1.36
- Males	.93 ± 1.50	.89 ± 1.36	.89 ± 1.48	.89 ± 1.48
- Females	.55 ± 1.07	.54 ± 1.01	.62 ± 1.16	.54 ± 1/06
Students ≥ 21 years	1.15 ± 1.60	1.13 ± 1.50	1.02 ± 1.47	.97 ± 1.42
- Males	1.35 ± 1.79	1.30 ± 1.62	1.15 ± 1.59	1.13 ± 1.54
- Females	.74 ± 1.03	.77 ± 1.14	.76 ±1.14	.64 ± 1.05
Students < 21 years	.73 ± 1.32	.69 ± 1.19	.74 ± 1.35	.72 ± 1.34
- Males	.85 ± 1.42	.80 ± 1.28	.83 ± 1.44	.83 ± 1.46
- Females	.52 ± 1.08	.50 ± .98	.59 ± 1.16	.52 ± 1.07
1st year Students	.66 ± 1.20	.66 ± 1.17	.71 ± 1.33	.71 ± 1.35
- Males	.75 ± 1.27	.78 ± 1.29	.77 ± 1.38	.82 ± 1.49
- Females	.50 ± 1.06	.46 ± .90	.60 ± 1.23	.51 ± 1.06

Among first-year students, significant gender differences were reported at T1 ($p = .003$), T2 ($p = .020$), and T3 ($p = .044$) with male students reporting more drinking than female students. However, male students reported drinking more than female students at all four time points.

HED episodes by age, class, and gender are presented in Table 3. Among all students, significant gender differences were found. Male students reported HED significantly more times than female students at each time point (T1, $p < .001$; T2, $p < .001$; T3, $p = .007$; T4, $p < .001$).

Significant gender differences were found in the number of HED episodes in students ≥ 21 years at T1 ($p = .042$) and T4 ($p = .049$); the gender difference at T2 was almost significant ($p = .052$). Male students ≥ 21 years reported more HED episodes than female students at all four time points. In students < 21 years, significant gender differences were found at all four time points (T1, $p = .001$; T2, $p = .001$; T3, $p = .024$; T4, $p = .004$), with male students reporting more HED episodes than female students.

Significant differences in the number of HED episodes were reported between students <21 years and those ≥ 21 years at all four time points (T1, $p = .001$; T2, $p < .001$; T3, $p = .030$; T4, $p = .043$). Students ≥ 21 years reported significantly more HED episodes than students < 21 years.

Among first-year students, significant gender differences in HED were reported at three time points (T1, $p = .031$; T2, $p = .004$; T4, $p = .014$). However, first-year male students reported more HED episodes than female students at all four time points.

The impact of drinking on retention of first-year students into the second year is presented in Table 4. Drinking status was statistically significant for male students ($p = .031$). First-year male students categorized as drinkers were 2.29 times more likely to not be enrolled second year compared to first-year males who were nondrinkers.

Table 5 presents the impact of HED episodes on retention of first-year students into the second year. HED was statistically significant for male students ($p = .024$). Based upon average number of HED episodes, first-year male students were 1.34 times more likely to not be enrolled second year with each one unit increase in HED episodes.

Table 4. Logistic Regression of Drink Status Predicting Likelihood of First-Year to Second-Year Retention

	B	S.E.	Wald	df	p	Odds Ratio	95% C.I. for Odds Ratio	
							Lower	Upper
Drink Status	.83	.38	4.65	1	.03	2.29	1.08	4.86
Constant	-2.43	.33	54.02	1	.00	.09		

Table 5. Logistic Regression of Average Heavy episodic Episodes Predicting Likelihood of First-Year to Second-Year Retention

	B	S.E.	Wald	df	p	Odds Ratio	95% C.I. for Odds Ratio	
							Lower	Upper
Heavy episodic	.29	.12	6.20	1	.01	1.34	1.06	1.68
Constant	-2.14	.21	102.31	1	.00	.12		

Discussion

There were two objectives to this study. The first objective was to analyze descriptive data on drinking patterns in college students. The literature contains a great deal of data related to the social drinking and HED patterns of college students (Monitoring the Future, 2010; SIUC/ Core Institute, 2008; Substance Abuse and Mental Health Services Administration, 2008), so the results of this study will contribute to the body of knowledge currently available.

The second objective of the study was to assess if the data collected provided evidence of an association between alcohol consumption in first-year students and retention into the second year. While much has been written about the academic consequences of drinking alcohol (Presley & Pimentel, 2006; Singleton, 2007; Wechsler & Nelson, 2008), data concerning a relationship between social and/or HED and retention is limited. Thus, a goal of this study was to address the lack of research on this topic and subsequently, fill a void in the literature.

In this study, over 62% of students reported drinking alcohol during the semester. This percentage is consistent with previous studies which have reported that approximately two-thirds of college students report drinking (O'Malley & Johnston, 2002). The highest percentage of drinkers in the study was found in students ≥ 21 years of age (73.5%).

The study also revealed that approximately 53% of students reported HED during the semester, which exceeds the proportions of students classified as HED in many previous studies (Wechsler, Lee, Kuo, Seibring, Nelson, & Lee, 2002). Similar to the social drinking statistic, the highest percentage of HED was found in students ≥ 21 years of age (62.5%).

A point of consideration is the composition of the sample. Approximately 65% of the students in the study were males and 35% were females and the composition of the first-year student population was 56% males and 44% females, which is consistent with institutional enrollment. The greater number of male students in the sample, however, may have contributed to the higher HED percentage found in this study, as Chomack and Collins (1987) suggested that drinking is a sex-typed behavior that occurs with other stereotypical masculine activities.

Another finding of the study was that a higher percentage of male students drank alcohol than did female students in the sample (63.7% vs. 59.9%). This gender difference is consistent with previous studies that have reported that more college men drink than do college women (Chomack & Collins, 1987; SIUC/Core Institute, 2008). However, this study also indicated that during the semester a higher percentage of female students < 21 years of age drank than did male students < 21 years of age (64.0% vs. 60.6%) and a slightly higher percentage of female students < 21 years reported HED than did male students < 21 years (54.6% vs. 54.0%). This data reflects a trend toward convergence of male and female students' drinking, as reported by Berkowitz and Perkins (Berkowitz & Perkins, 1987).

Across the four time points, freshmen, or first-year students, reported the lowest mean number of drinks and lowest mean number of HED episodes. This is contrary to previous studies that have indicated freshmen drink more frequently and in greater quantity (Leeman & Wapner, 2001) and heavy episodic drink more frequently than upperclassmen (Vaughan, Corbin, & Fromme, 2009). However, significant gender differences were noted at each time point with male students in the sample drinking and HED more than female students, supporting previous research (Nelson, Lust, Story, & Ehlinger, 2009). The higher percentage of male students in the sample may have had an influence on these findings.

The second objective of the study was to assess if any evidence existed that associated alcohol consumption in first-year students

25

with retention into second year. While drinking patterns in the sample were similar to national data[4] and HED percentages were greater than those reported in the literature (Wechsler, Lee, Kuo, Seibring, Nelson, & Lee, 2002), the retention of first-year students into second year (85%) slightly exceeded this institutions 2009 cohort and that of its peer institutions (81%). In fact, the retention rate of male students in this study was 86.6%; retention of female students was 82.1%.

As mentioned previously, data on students' drinking behaviors and retention is limited, with most studies reporting on the academic consequences of drinking and HED (i.e., receiving a lower grade on an exam or project (American College Health Association – National College Health Assessment II. (2010); missing class (National Institute on Alcohol Abuse and Alcoholism, 2010), a lower GPA (Wolaver, 2002)). This study did provide evidence that drinking and HED impact retention. Drinking status was statistically significant for male students ($p = .031$), indicating that first-year male students were 2.29 times more likely to not be enrolled second year compared to nondrinking first-year male students. HED was also statistically significant for male students ($p = .024$) in that first-year male students were 1.34 times more likely to not be enrolled second year with each one unit increase in HED episodes. These findings are contrary to studies indicating no relationship between drinking and retention (DeBerard, Spielmans, & Julka, 2004) and that heavy alcohol use does not have an important effect on academic performance in college (Paschall & Freisthler, 2003). Again, the large number of male students in the sample must be considered when reviewing the findings of this study.

The two survey questions related to drinking and HED are consistent with those used in previous research. However, a limitation of this study was that a standard drink was not defined within the questions (i.e. 12 ounces of beer) and the data were collected on only one campus consisting of a fairly homogenous group of mostly Caucasian students. However, strengths of the study are that data were collected at multiple (four) time points and the sample was representative of the student population on the campus (86% of enrollment Caucasian; 98% of first-year students Caucasian).

In summary, over 62% of the sample reported drinking and approximately 53% reported HED over the course of a semester, with first-year students reporting the least amount of drinking and HED. A higher percentage of male students reported drinking and HED than did female students. In addition, male students drank and reported HED significantly more than female students at all four time points during the semester. Another significant finding was that drinking among first-year male students was found to negatively affect retention. Moreover, HED episodes among first-year males were also found to negatively impact retention. Implications of this study suggest that a relationship exists between social drinking in first-year male students and retention, as well as HED in first-year male students and retention. These findings are important for health promotion professionals because they suggest programming related to social drinking and HED, especially among first-year male students, is critical to retention efforts.

References

Aertgeerts, B., & Buntinx, F. (2002). The relation between alcohol abuse or dependence and academic performance in first-year college students. *Journal of Adolescent Health, 31*(3), 223-225.

American College Health Association – National College Health Assessment II. (2010). Retrieved from http://www.achancha.org/docs/ACHA-NCHA-II_ReferenceGroup_ExecutiveSummary_Spring2010.pdf.

Attwood, A. S., Ataya, A. F., Benton, C. P., Penton-Voak, I. S., & Munafo, M. R. (2009). Effects of alcohol consumption and alcohol expectancy on the categorisation of perceptual cues of emotional expression. *Psychopharmacology, 204*(2), 327-334.

Berkowitz, A. D., & Perkins, H. W. (1987). Recent research on gender differences in collegiate alcohol use. *Journal of American College Health, 36*(2), 123-129.

Chomack, S., & Collins, R. L. (1987). Relationship between sex-role behaviors and alcohol consumption in undergraduate men and women. *Journal of Studies on Alcohol and Drugs, 48*(3), 194-201.

DeBerard, M. S., Spielmans, G. I., & Julka, D. C. (2004). Predictors of academic achievement and retention among college freshmen: A longitudinal study. *College Student Journal, 38*(1), 66-80.

Del Boca, F. K., Dirkes, J., Greenbaum, P. E., & Goldman, M. S. (2004). Up close and personal: Temporal variability in the drinking of individual college students during their first year. *Journal of Consulting Clinical Psychology, 72*(2), 155-164.

Engs, R. C., Diebold, B. A., & Hanson, D. J. (1996). The drinking patterns and problems of a national sample of college students, 1994. *Journal of Alcohol and Drug Education, 41*, 13-33.

Engle, H., & Furnham, A. (1996). Attitudes, knowledge, and use of alcohol in university students. *Counseling Psychology Quarterly, 9*(3), 309-324.

Jennison, K. M. (2004). The short-term effects and unintended long-term consequences of HED in college: A 10-year follow-up study. *American Journal on Drug and Alcohol Abuse, 30*(3), 659-684.

Leeman, R. F., & Wapner, S. (2001). Some factors involved in alcohol consumption of first-year undergraduates. *Journal of Drug Education, 31*(3), 249-262.

McGrath, M. M., & Braunstein, A. (1997). The prediction of freshmen attrition: An examination of the importance of certain demographic, academic, financial, and social factors. *College Student Journal, 31*(3), 396-408.

Monitoring the Future. National survey results on drug use 1975-2010, Volume II. Retrieved from http://monitoringthefuture.org/pubs/monographs/mtf-vol2_2010.pdf.

National Institute on Alcohol Abuse and Alcoholism. A snapshot of annual high-risk college drinking consequences, 2010. Retrieved from http://www.collegedrinkingprevention.gov/StatsSummaries/snapshot.aspx.

National Institute on Alcohol Abuse and Alcoholism. 2010. College Drinking, 2010. Retrieved from http://www.niaaa.nih.gov/alcohol-health/special-populations-co-occurring-disorders/college-drinking. Accessed May, 2013.

Nelson, M. C., Lust, K., Story, M., & Ehlinger, E. (2009). Alcohol use, eating patterns, and weight behaviors in a university population. *American Journal of Health Behavior, 33*(3), 227-237.

Nelson, T. F., & Wechsler, H. (2001). Alcohol and college athletes. *Medicine and Science in Sports and Exercise, 33*(1), 43-47.

O'Malley, P. M., & Johnston, L. D. (2002). Epidemiology of alcohol and other drug use among American college students. *Journal of Studies on Alcohol and Drugs, 14*, 23-39.

Paschall, M. J., & Freisthler, B. (2003). Does heavy drinking affect academic performance in college? Findings from a prospective study of high achievers. *Journal of Studies on Alcohol and Drugs, 64*(4), 515-519.

Perkins, H. W. (2002). Surveying the damage: A review of research on consequences of alcohol misuse in college populations. *Journal of Studies on Alcohol and Drugs, 14*, 91-100.

Presley, C. A., & Pimentel, E. R. (2006). The introduction of the heavy and frequent drinker: A proposed classification to increase accuracy of alcohol assessments in postsecondary educational settings. *Journal of Studies on Alcohol and Drugs, 67*(2), 324-331.

Pritchard, M. E., & Wilson, G. S. (2003). Using emotional and social factors to predict student success. *Journal of College Student Development, 44*(1), 18-28.

Singleton, R. A. (2007). Collegiate alcohol consumption and academic performance. *Journal of Studies on Alcohol and Drugs, 68*(4), 548-555.

SIUC/Core Institute. 2008. Executive Summary, Core Alcohol and Drug Survey-Long form. Retrieved from http://www.core.siuc.edu/pdfs/report08.pdf.

Substance Abuse and Mental Health Services Administration. Results from the 2008 National Survey on Drug Use and Health: National findings. Retrieved from http://oas.samhsa.gov/NSDUH/2k8NSDUH/2k8results.cfm#Ch3.

The Higher Education Center for Alcohol and Other Drug Abuse and Violence Prevention. (2009). Alcohol and other drugs on campus: The scope of the problem. Retrieved from http://www.higheredcenter.org/files/product/scope.pdf.

Turrisi, R., Padilla, K. K., & Wiersma, K. A. (2000). College student drinking: An examination of theoretical models of drinking tendencies in freshmen and upperclassmen. *Journal of Studies on Alcohol and Drugs, 61*(4):598-602.

Vaughan, E. L., Corbin, W. R., & Fromme, K. (2009). Academic and social motives and drinking behavior. *Psychology of Addictive Behaviors, 23*(4), 564-576.

Wechsler, H., Lee, J. E., Kuo, M., & Lee, H. (2000). College binge drinking in the 1990s: A continuing problem. *Journal of American College Health, 48*(5), 199-210.

Wechsler, H., Lee, J. E., Kuo, M., Seibring, M., Nelson, T. F., & Lee, H. (2002). Trends in college binge drinking during a period of increased prevention efforts. *Journal of American College Health, 50*(5), 203-217.

Wechsler, H., & Nelson, T. F. (2008). What we have learned from the Harvard School of Public Health College Alcohol Study: Focusing attention on college student alcohol consumption and the environmental conditions that promote it. *Journal of Studies on Alcohol and Drugs, 69*(4), 1-10.

Wood, P. K., Sher, K. J., Erickson, D. J., & DeBord, K. A. (1997). Predicting academic problems in college from freshman alcohol involvement. *Journal of Studies on Alcohol and Drugs, 58*(2), 200-210.

Wolaver, A. M. (2002). Effects of heavy drinking in college on study effort, grade point average, and major choice. *Contemporary Economic Policy, 20*(4), 415-428.

Wyman, F. (1997). A predictive model of retention rate at regional two-year colleges. *Community College Review, 25*(1), 29-58.