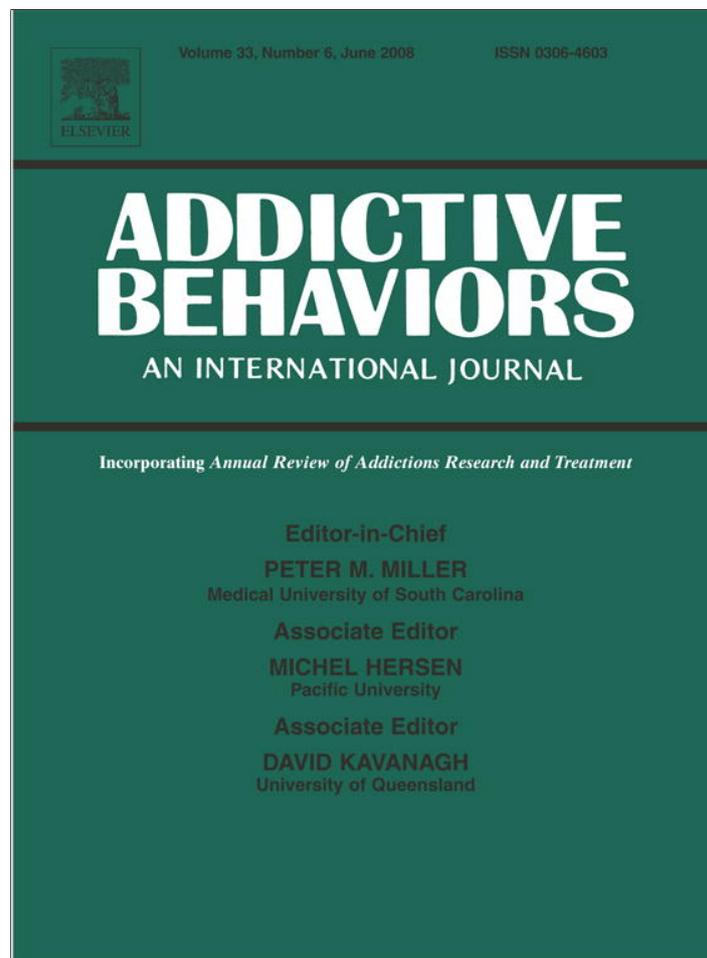


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The role of self-consciousness in the experience of alcohol-related consequences among college students[☆]

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Abstract

Heavy drinking among college students is a well-established national concern. An in-depth look at the characteristics and traits of heavy drinking students is an essential precursor to the development of successful targeted interventions with at-risk students. The current study examines the role self-consciousness (private, public, social anxiety) plays in the experience of alcohol-related consequences among a sample of 1,168 student members of campus organizations. Male gender predicted drinking in the sample, while both private self-consciousness and social anxiety predicted less drinking. Public self-consciousness predicted alcohol-related consequences over and above the variance explained by drinking for both males and females. Additionally, both gender and social anxiety moderated the effect of drinking on problems. Heavier drinking female students and heavier drinking students high in social anxiety appear more susceptible to the experience of negative consequences. These results highlight the direct and indirect impact that self-consciousness and gender have on college students' experience of alcohol-related negative consequences.

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Keywords: Self-consciousness; Social anxiety; Risky drinking; Campus organizations; College students

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1. Introduction

Heavy drinking among college students is a significant health risk associated with negative consequences of varying severity for both heavy drinkers and the campus community (Hingson, Heeren, Winter, & Wechsler, 2005; Wechsler et al., 2002). While there are many intervention studies targeting high risk drinkers and alcohol-related consequences (Barnett & Read, 2005; Larimer, Cronce, Lee, & Kilmer, 2004), researchers seek to examine the underpinnings of students' use to fully understand the nature of college drinking and to aid in the prevention effort. The trait of self-consciousness, a concept pertaining to the attendance of certain aspects of the self, may be particularly relevant in the college student population, where peer influence and desire to succeed may increase self-awareness. Self-consciousness (Fenigstein, Scheier, & Buss, 1975) includes a number of specific domains closely related to self-awareness and relevant to students: preoccupation with past, present, and future behavior; sensitivity to inner feelings; recognition of personal positive and negative attributes; introspection; tendency to picture or imagine oneself; awareness of appearance; and concerns regarding others' appraisals. Self-consciousness is divided into two major components – *private self-consciousness* and *public self-consciousness*. A third component, which relates to private and public self-consciousness, is *social anxiety*.

Private self-consciousness is primarily cognitive in nature and pertains to an individuals' attendance to inner thoughts and reflections. One's own needs, desires, and ideas are more salient at higher levels. Public self-consciousness encompasses awareness and concern of the self as a social object that can be influenced by others. Individuals high in public self-consciousness are preoccupied with self-presentation, social identity, and approval seeking. Social anxiety refers to a reaction to self-focused attention accompanied by discomfort felt in the presence of others. Early work with the self-consciousness trait and alcohol use suggested that individuals may use alcohol as a way to avoid negative self-conscious affect and self-evaluation (Hull 1981; Hull & Young, 1983). Self-consciousness, as it relates to social influence, may have a unique relationship to alcohol in the student population where social influences and social identity issues are particularly prominent.

The social context of college is a challenging environment demanding awareness of both the self and of others. Each day, students are faced with social scenarios involving meeting new people and experiencing new situations. At the same time, students are faced with decisions about alcohol use. Pressure from other students has been documented as a major source of influence on students' drinking rates (Borsari & Carey, 2001). Public self-consciousness, or an awareness of how one is viewed by peers, may be related to consumption levels. Froming and Carver (1981) found that public self-consciousness was associated with a greater tendency to be compliant with social pressure. In contrast, high private self-consciousness may serve as a protective factor among college aged drinkers (Rogosch, Chassin, & Sher, 1990) as marked awareness of one's self may supersede outside pressure to conform to drinking norms.

However, recent investigations of self-consciousness on drinking rates have displayed disparate results. Students higher in private self-consciousness had greater associations between private self-consciousness and alcohol expectancies than those lower in private self-consciousness (Bartholow, Sher, & Strathman, 2000). Research with Greek students found that being higher in either private or public self-consciousness served as a protective factor for frequency of drunken behavior among fraternity members, whereas sorority members high in either private or public self-consciousness appeared to drink more than those low in these traits (Park, Sher, & Krull, 2006). Finally, research with social anxiety's impact on problematic drinking has also provided inconsistent findings (see review by Morris, Stewart, & Ham,

2005). For example, some researchers found that students higher in social anxiety drank more than less socially anxious peers (Neighbors et al., 2007), while others found that social anxiety did not have a direct effect on alcohol use (Ham & Hope, 2005). Coupled with inconsistent findings across all three factors, very few studies have examined self-consciousness' relation to alcohol-related consequences, the reduction of which is the major concern of interventions seeking to reduce drinking.

The current study examines the potential moderating role that self-consciousness plays in drinking and the experience of alcohol-related negative consequences using a large, diverse sample of college students from campus organizations (fraternities, sororities, non-Greek service organizations). Based on previous research with this construct and alcohol consumption, as well as the relationship between social pressure and alcohol use, public self-consciousness is expected to play a larger role in consumption levels and in the experience of alcohol-related negative consequences than private self-consciousness and social anxiety. Finally, as there is disparity among the drinking patterns of males and females (e.g., Engs & Hanson, 1985; Johnston, O'Malley, & Bachman, 2000; Wechsler et al., 2002), as well as contrasting findings regarding self-consciousness and alcohol use among male and female Greek members (Park et al., 2006), gender will be examined as a potential moderator between self-consciousness and alcohol-related problems.

2. Method

2.1. Participants

A total of 1,438 students from 20 campus organizations at a West Coast university were recruited to participate in a larger intervention study. All 20 campus organizations (7 fraternities, 7 sororities, 6 service organizations) participated in the study. Service organizations are similar to Greek organizations in that members share similar activities focusing on service to the campus and surrounding community. All members ($N=1438$) were emailed an online survey and 1,168 members completed the survey, yielding an overall completion rate of 81%. All organizations received a monetary incentive between \$125 and \$250 depending on organization size. Participants were 75% female, with 24% of participants from fraternities, 56% from sororities, and 20% from service organizations. Age varied, with 13% 18 years or younger, 27% 19 years old, 31% 20 years old, 28% 21 years or older, and 1% "declined to state." Nineteen percent were first-year students, 31% were sophomores, 29% were juniors, and 21% were seniors. One-percent indicated "5th year status" or "declined to state." Finally, ethnic makeup of the sample was 66% Caucasian, 13% Hispanic, 7% mixed, 7% Asian/Pacific Islander, 3% African American, 3% "other," and 1% "declined to state." Seven percent ($n=102$) reported no drinking in the past month.

2.2. Design and procedure

Data collection occurred over one spring semester. All participants electronically signed local IRB-approved consent forms before completing the online survey. Participants were informed that their data would not be connected to their names or organizations and were also assured that their responses would not be relayed to campus administrators or university personnel.

The survey consisted of demographics questions assessing age, sex, class year, group membership, and ethnicity. Additionally, participants were asked two items regarding how many days they drank in the past 30 days and how many drinks on average they consumed per drinking event over the past 30 days. These two variables were multiplied together to form a drinks per month composite variable used in analyses. To

standardize responses, pictures and descriptions of standard drinks (one drink containing 1/2 ounce of ethyl alcohol) were provided. Participants also received the 23-item Self-Consciousness Scale (Fenigstein et al., 1975) to measure the self-consciousness trait. The measure is comprised of the three subscales of private self-consciousness, public self-consciousness, and social anxiety. Participants' responses were based on 5-point Likert scales ranging from 0 (*extremely uncharacteristic*) to 4 (*extremely characteristic*). Reliability tests revealed adequate reliability within subscales: private self-consciousness ($\alpha=.71$), public self-consciousness ($\alpha=.81$), and social anxiety ($\alpha=.78$). Finally, the 23-item Rutgers Alcohol Problem Index (RAPI; White & Labouvie, 1989) assessed alcohol-related negative consequences in the past 30 days. Response options ranged from 0 (*never*) to 4 (*10 or more times*) ($\alpha=.90$).

3. Results

3.1. Analysis strategy

Hierarchical multiple regression (Cohen, Cohen, West, & Aiken, 2003) was chosen as the primary analysis strategy. Two hierarchical regression analyses were conducted. Gender was dummy coded (men=1, women=0). All other predictors were mean centered to facilitate interpretation of interactions and to reduce non-essential multicollinearity. Following suggestions from Tabachnick and Fidell (2007), the drinking variables were both winsorized to reduce the influence of outliers. Twenty-four scores above three standard deviations from the mean on drinks per month were recoded to the original mean multiplied by three standard deviations (139.43), revealing a mean of 32.02 (SD=33.28) drinks per month. Twenty-two scores above three standard deviations on the alcohol-related problems scale (RAPI) were recoded to 22.66, revealing a mean RAPI score of 3.94 (SD=5.19). Mean scores for the three self-consciousness factors were 24.60 (SD=5.14) for private self-consciousness, 17.33 (SD=4.69) for public self-consciousness, and 10.68 (SD=4.53) for social anxiety. All scores were within three standard deviations for the self-consciousness factors.

In the first hierarchical multiple regression analysis, drinking was specified as the dependent variable and main effects of gender, private self-consciousness, public self-consciousness, and social anxiety were entered at Step 1. Two way products evaluating gender as a potential moderator of private self-consciousness, public self-consciousness, and social anxiety were entered at Step 2. In the second analysis, alcohol-related problems were specified as the dependent variable. Main effects of gender, drinking, private self-consciousness, public self-consciousness, and social anxiety were entered at Step 1. We were again interested in whether gender might moderate the relationship between private self-consciousness, public self-consciousness, and social anxiety and consequences. We also wished to evaluate whether the association between drinking and alcohol-related problems was moderated by gender, private self-consciousness, public self-consciousness, and social anxiety. The seven relevant two-way product terms evaluating these potential interactions were entered at Step 2. Significant interactions were interpreted and simple slopes were calculated following methods described by Aiken and West (1991). Predicted cell means were graphed specifying high and low values as one standard deviation above and below their respective means.

3.2. Alcohol use

Multiple regression results evaluating drinking as a function of gender, private self-consciousness, public self-consciousness, and social anxiety are reported in Table 1. Results at Step 1 indicated that

gender was strongly associated with drinking, with men drinking more. In addition, higher levels of private self-consciousness and social anxiety were both significantly associated with *less* drinking. Public self-consciousness was not uniquely associated with drinking. Results at Step 2 did not support gender as a moderator of private self-consciousness, public self-consciousness, or social anxiety.

Table 1

Drinking and alcohol-related problems as a function of gender, private self-consciousness, public self-consciousness, and social anxiety

Model 1					
Dependent variable – drinking					
Step	Predictor	Beta at Step	<i>t</i>	<i>R</i> ² change	<i>p</i>
Step 1	Gender	.37	13.46***	0.15	<.001
	Private SC	–.09	–2.58*		
	Public SC	.05	1.31		
	Social Anxiety	–.09	–3.17***		
Step 2	Gender × Private SC	–.06	–1.45	0.01	<.001
	Gender × Public SC	–.09	–1.88		
	Gender × Social anxiety	.03	0.85		
Final model: <i>F</i> (7, 1156)=31.80, <i>p</i> <.001; <i>R</i> ² =.16					
Model 2					
Dependent variable – RAPI composite					
Step	Predictor	Beta at Step	<i>t</i>	<i>R</i> ² change	<i>p</i>
Step 1	Gender	–.00	–0.16	0.28	<.001
	Private SC	–.00	–.12		
	Public SC	.10	3.05**		
	Social anxiety	.04	1.34		
	Drinking	.53	19.49***		
Step 2	Gender × Drinking	–.16	–3.83***	0.03	<.001
	Private SC × Drinking	.06	1.74		
	Public SC × Drinking	.05	1.35		
	Social anxiety × Drinking	.07	2.58**		
	Gender × Private SC	–.55	–1.28		
	Gender × Public SC	–.06	–1.36		
	Gender × Social anxiety	.01	0.43		
Final model: <i>F</i> (12, 1150)=42.53, <i>p</i> <.001; <i>R</i> ² =.31					

Note: Private SC = Private Self-Consciousness, Public SC = Public Self-Consciousness.

Drinking = Total Drinks in the Past Month.

****p*<.001; ***p*<.01; **p*<.05.

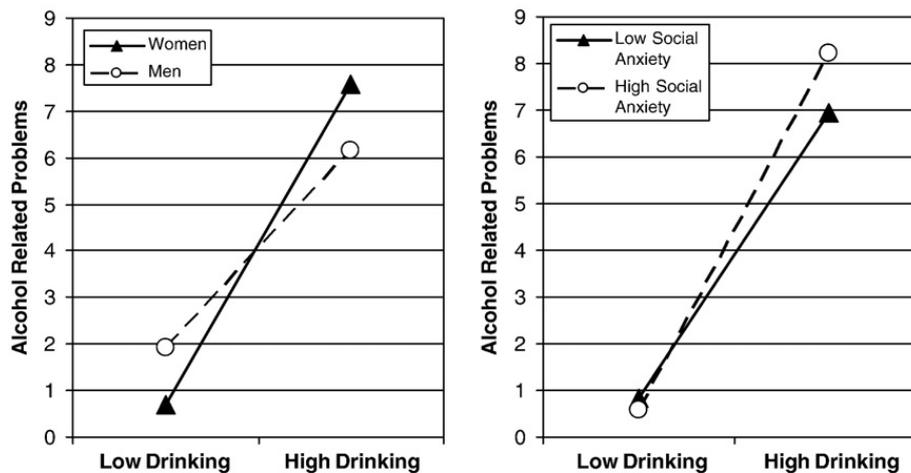


Fig. 1. Significant interactions found in multiple regressions.

3.3. Alcohol-related problems

Hierarchical multiple regression analysis examining alcohol-related problems as a function of gender, drinking, private self-consciousness, public self-consciousness, and social anxiety is reported in Table 1. Results at Step 1 revealed that drinking was strongly associated with alcohol-related problems whereas gender did not account for unique variance in alcohol-related problems. Higher levels of public self-consciousness were uniquely associated with more alcohol-related problems over and above variance accounted for by drinking. Neither private self-consciousness nor social anxiety was uniquely associated with alcohol-related problems. Two interactions were significant at Step 2. The relationship between drinking and alcohol-related problems was stronger among women and among more socially anxious individuals (see Fig. 1). However, tests of simple slopes indicated significance for men, $\beta = .44$, $t(1150) = 12.15$, $p < .001$, and women, $\beta = .66$, $t(1150) = 16.43$, $p < .001$. Similarly, tests of simple slopes were significant for those both higher in social anxiety, $\beta = .74$, $t(1150) = 13.79$, $p < .001$ and for those lower in social anxiety, $\beta = .59$, $t(1150) = 12.88$, $p < .001$.

4. Discussion

The current study evaluated the relationship between gender and self-consciousness (private self-consciousness, public self-consciousness, and social anxiety) on drinking and alcohol-related negative consequences in a sample of college students from campus organizations. Consistent with our hypotheses, higher levels of private self-consciousness and social anxiety were associated with less drinking. While being male was related to heavier drinking levels, gender did not moderate the relationship between the three self-consciousness factors and drinking. Regarding consequences, public self-consciousness predicted alcohol-related consequences over and above the variance explained by drinking. Moderation analyses revealed that both gender and social anxiety moderated the relationship between drinking and consequences. Heavy drinking was more strongly associated with alcohol-related consequences among women than men. In addition, heavy drinking was more strongly associated with alcohol problems among students with higher levels of social anxiety relative to those with lower levels.

The current report reaffirms findings from previous research examining the differential drinking levels of men and women and the protective role of private self-consciousness and social anxiety on heavy drinking. The findings are consistent with previous research that males traditionally drink at heavier levels than females (e.g., Engs & Hanson, 1985; Johnston et al., 2000; Wechsler et al., 2002). Also consistent with previous research (Park et al., 2006; Rogosch et al., 1990), higher levels of private self-consciousness and social anxiety were related to less drinking. Perhaps sensitivity to inward thoughts and feelings of individual desires, wants, and anxiety levels both supplant the desire to conform to social pressure or implement heavy consumption patterns.

The unique findings of this report are those revealing the role self-consciousness plays in the experience of alcohol-related consequences over and above drinking. First, a stronger attention to oneself as a social being and constant awareness with how one is viewed by others (i.e., public self-consciousness) predicts heavier levels of alcohol-related consequences among both male and female participants even while controlling for drinking. The sample assessed may be composed of a highly social functioning group of students who are eager to be involved in activities where they can meet and interact with peers. Members of campus social organizations may place more emphasis on personal appearance, social identity, and connectedness to a social group and this desire for social identity appears to play a part in the experience of drinking and associated consequences.

Our findings also reveal an interaction effect for gender and drinking on alcohol-related consequences, suggesting that heavy drinking females were more likely to experience problems from use than males who drank at high levels. This relationship between women's drinking and alcohol consequences may be caused by the differential gender effects of alcohol on blood alcohol levels, which, with weight being equal, can result in higher intoxication levels among women (Jones & Jones, 1976; Task Force of the National Advisory Council on Alcohol Abuse and Alcoholism, 2002). Additionally, women are exposed to a variety of sexual consequences not often experienced by men (Abbey, 2002; Parks & Fals-Stewart, 2004). Thus, the combination of potentially higher intoxication levels and susceptibility to negative sexual consequences may help explain the observed effects.

Social anxiety has been shown to both serve as a protective factor and a risk factor for problematic drinking in college samples (e.g., Ham & Hope, 2005; Lewis & O'Neill, 2000; Neighbors et al., 2007). Our results indicate the combination of heavy drinking and higher levels of social anxiety associates with alcohol-related negative consequences among members of campus organizations. Although social anxiety may have served as a protective factor against drinking in the current sample, those with high levels of social anxiety who did choose to drink at heavy levels were most at risk for consequences. Perhaps some individuals high in social anxiety who desire to be a part of campus groups use alcohol as an outlet to ease their uneasiness or fear in social situations within the groups they long to connect with. Heavier drinking has the potential to influence the experience of consequences in such individuals.

4.1. Limitations

Limitations exist in the current study. All alcohol data collected were retrospectively self-reported and are therefore susceptible to memory effects and self-report error. However, reviews of self-report data suggest it is often valid and reliable among both adult and adolescent populations (Babor, Steinberg, Del Boca, & Anton, 2000; Brener, Billy, & Grady, 2003). Additionally, we used one measure of social anxiety to assess levels of the construct among students. However, this is not a clinically-based tool and it is unknown if "high" levels of social anxiety in the current sample relate to the specific DSM-IV (American

Psychiatric Association, 1994) criteria of social anxiety. Specifically, social anxiety is defined by the self-consciousness scale as the general *discomfort* felt in social situations, whereas the DSM defines social anxiety as the *fear of* social situation. Further researchers may want to explore the relationship between diagnosed social anxiety and drinking-related problems with college students. Finally, only members of campus organizations at one site were used in the current study. These students may be a self-selected group of individuals who are outgoing and have a strong sense of social identity. Replicating the current findings with larger and more diverse college samples from multiple sites may help to strengthen the results found.

4.2. Conclusion

These findings further the understanding of college drinking by highlighting the direct and indirect relationships between self-consciousness and alcohol-related consequences. Both heavy drinking females and individuals high in social anxiety may be at particular risk for these consequences. Understanding the individual factors associated with drinking in college is an essential antecedent to the design and implementation of interventions targeting heavy drinking and its resulting consequences. Future research of college drinking that includes self-consciousness and other moderating and mediating variables appears warranted and may help provide researchers and clinicians with better mechanisms and insight to help students in need.

References

- Abbey, A. (2002). Alcohol-related sexual assault: A common problem among college students. *Journal of Studies on Alcohol*, 14 (Suppl), 118–128.
- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Thousand Oaks, CA: Sage Publications.
- American Psychiatric Association (1994). *Diagnostic and statistical manual of mental disorders*, (4th ed.) Washington, DC: Author.
- Babor, T. F., Steinberg, K., Del Boca, F., & Anton, R. (2000). Talk is cheap: Measuring drinking outcomes in clinical trials. *Journal of Studies on Alcohol*, 61, 55–63.
- Barnett, N. P., & Read, J. P. (2005). Mandatory alcohol intervention for alcohol-abusing college students: A systematic review. *Journal of Substance Abuse Treatment*, 29, 147–158.
- Bartholow, B. D., Sher, K. J., & Strathman, A. (2000). Moderation of the expectancy-alcohol use relation by private self-consciousness: Data from a longitudinal study. *Personality and Social Psychology Bulletin*, 26, 1409–1420.
- Borsari, B., & Carey, K. B. (2001). Peer influences on college drinking: A review of the research. *Journal of Substance Abuse*, 13, 391–424.
- Brener, N. D., Billy, J. O., & Grady, W. R. (2003). Assessment of factors affecting the validity of self-reported health-risk behavior among adolescents: Evidence from the scientific literature. *Journal of Adolescent Health*, 33, 436–457.
- Cohen, J., Cohen, P., West, S., & Aiken, L. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences*, (3rd ed.) Hillsdale, NJ: Lawrence Erlbaum Associates.
- Engs, R. C., & Hanson, D. J. (1985). The drinking patterns and problems of college students: 1983. *Journal of Alcohol and Drug Education*, 31(1), 65–83.
- Fenigstein, A., Scheier, M. F., & Buss, A. H. (1975). Public and private self-consciousness: Assessment and theory. *Journal of Consulting and Clinical Psychology*, 45, 522–527.
- Froming, W. J., & Carver, C. S. (1981). Divergent influence of private and public self-consciousness in a compliance paradigm. *Journal of Consulting and Clinical Psychology*, 15, 159–171.
- Ham, L. S., & Hope, D. A. (2005). Incorporating social anxiety into a model of college student problematic drinking. *Addictive Behaviors*, 30, 127–150.
- Hingson, R., Heeren, T., Winter, M., & Wechsler, H. (2005). Magnitude of alcohol-related mortality and morbidity among U.S. college students ages 18–24: Changes from 1998 to 2001. *Annual Review of Public Health*, 26, 259–279.

- Hull, J. G. (1981). A self-awareness model of the causes and effects of alcohol consumption. *Journal of Abnormal Psychology*, 90, 586–600.
- Hull, J. G., & Young, R. D. (1983). The self-awareness reducing effects of alcohol consumption: Evidence and implication. In J. Suls, & A. G. Greenwald (Eds.), *Psychological perspectives on the self*, Vol. 2. (pp. 159–190) Hillsdale, NJ: Erlbaum.
- Johnston, L. D., O'Malley, P. M., & Bachman, J. G. (2000). *Monitoring the future national survey results on drug use, 1975–1999 Volume II: College students and adults age 19–40 (NIH Publication No. 00-4803)* Rockville, MD: National Institute on Drug Abuse.
- Jones, B. M., & Jones, M. K. (1976). Women and alcohol: Intoxication, metabolism and the menstrual cycle. In M. Greenblatt, & M. A. Schuckit (Eds.), *Alcoholism problems in women and children* (pp. 103–136). New York: Grune & Stratton.
- Larimer, M. E., Cronce, J. M., Lee, C. M., & Kilmer, J. R. (2004). Brief intervention in college settings. *Alcohol Research and Health*, 28, 94–104.
- Lewis, B. A., & O'Neill, H. K. (2000). Alcohol expectancies and social deficits relating to problematic drinking among college students. *Addictive Behaviors*, 25, 295–299.
- Morris, E. P., Stewart, S. H., & Ham, L. S. (2005). The relationship between social anxiety disorder and alcohol use disorders: A critical review. *Clinical Psychology Review*, 25, 734–760.
- Neighbors, C., Fossos, N., Woods, B., Fabiano, P., Sledge, M., & Frost, D. (2007). Social anxiety as a moderator of the relationship between perceived norms and drinking. *Journal of Studies on Alcohol and Drugs*, 68, 91–96.
- Park, A., Sher, K. J., & Krull, J. L. (2006). Individual differences in the “Greek effect” on risky drinking: The role of self-consciousness. *Psychology of Addictive Behaviors*, 20, 85–90.
- Parks, K. A., & Fals-Stewart, W. (2004). The temporal relationship between college women's alcohol consumption and victimization experiences. *Alcoholism: Clinical and Experimental Research*, 28, 625–629.
- Rogosch, F., Chassin, L., & Sher, K. J. (1990). Personality variables as mediators and moderators of family history risk for alcoholism: Conceptual and methodological issues. *Journal of Studies on Alcohol*, 51, 310–318.
- Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics*, (5th ed.) Boston: Allyn and Bacon.
- Task Force of the National Advisory Council on Alcohol Abuse and Alcoholism (2002). *A call to action: Changing the culture of drinking at U.S. colleges (NIH Publication No. 02-5010)* Rockville, MD: National Institute on Alcohol and Abuse and Alcoholism.
- Wechsler, H., Lee, J. E., Kuo, M., Seibring, M., Nelson, T. F., & Lee, H. P. (2002). Trends in college binge drinking during a period of increased prevention efforts: Findings from four Harvard School of Public Health study surveys, 1993–2001. *Journal of American College Health*, 50, 203–217.
- White, H. R., & Labouvie, E. W. (1989). Towards the assessment of adolescent problem drinking. *Journal of Studies on Alcohol*, 50, 30–37.