Social Anxiety Symptoms and Drinking Behaviors Among College Students: The Mediating Effects of Drinking Motives

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The impact of social anxiety on negative alcohol-related behaviors among college students has been studied extensively. Drinking motives are considered the most proximal indicator of college student drinking behavior. The current study examined the mediating role of drinking motives in the relationship that social anxiety symptoms have with problematic (alcohol consumption, harmful drinking, and negative consequences) and safe (protective behavioral strategies) drinking behaviors. Participants were 532 undergraduates who completed measures of social anxiety, drinking motives, alcohol use, harmful drinking patterns, negative consequences of alcohol use, and protective behavioral strategy use. Our results show that students with higher levels of social anxiety symptoms who were drinking for enhancement motives reported more harmful drinking and negative consequences, and used fewer protective behavioral strategies. Thus, students who were drinking to increase their positive mood were participating in more problematic drinking patterns compared with students reporting fewer social anxiety symptoms. Further, conformity motives partially mediated the relationship between social anxiety symptoms and negative consequences. Thus, students with more symptoms of social anxiety who were drinking in order to be accepted by their peers were more likely than others to experience negative consequences. Clinical and research implications are discussed.

Keywords: social anxiety, college alcohol use, protective strategies, drinking motives

College student abuse of alcohol continues to be a major public health concern in the United States (National Institute on Alcohol Abuse & Alcoholism, 2012). Roughly 82% of college students consume alcohol with 37% of those students participating in heavy episodic drinking (i.e., five or more drinks in one sitting during the past 2 weeks for men and four or more drinks in one sitting for women; Johnston, O’Malley, Bachman, & Schulenberg, 2011). This is an important issue because of the negative consequences that are often experienced by college student drinkers. Alcohol consumption plays a role in 97,000 unwanted sexual experiences, 599,000 unintentional injuries, and 1,825 deaths each year among college students (Hingson, 2009). Thus, a common goal across college campuses is to reduce the risks associated with heavy drinking especially for students in at-risk groups.

One subgroup at risk for alcohol-related negative consequences is college students with social anxiety symptoms (i.e., the irrational fear of negative evaluation and distress experienced in social situations; Kashdan & Steger, 2006). Social anxiety disorder has been identified as a risk factor for a future alcohol use disorder (Buckner, Timpano, Zvolensky, Sachs-Ericsson, & Schmidt, 2008; Grant et al., 2006). For example, Buckner, Timpano, Zvolensky, Sachs-Ericsson, and Schmidt (2008) found approximately 80% (n = 156) of their sample reported their social anxiety disorder predated their alcohol use disorder. Thus, gaining a better understanding of the link between social anxiety symptoms and alcohol use behaviors may be vital to identifying the factors that influence college student alcohol use and improving prevention efforts on college campuses. Unfortunately, inconsistent findings have emerged across studies concerning the associations that social anxiety symptoms have with alcohol-related outcomes.

The relationship between social anxiety and alcohol-related outcomes in college students appears to vary based on the alcohol-related construct that is being assessed. Some researchers have found a positive relationship between social anxiety and harmful drinking (e.g., frequently drinking more than six drinks on one occasion) and negative consequences (e.g., got into legal trouble or missed class; Buckner & Heimberg, 2010; Buckner, Schmidt, & Eggleston, 2006; Lewis & O’Neill, 2000; Stewart, Morris, Mellings, & Komar, 2006), whereas others have found that social anxiety and alcohol consumption have either no relationship (Gilles, Turk, & Fresco, 2006; O’Grady, Cullum, Armeli, & Tennen, 2011) or a negative relationship when consumption is assessed by quantity and frequency of use (Ham, 2009; Ham, Bonin,
Social anxiety and drinking behaviors

Thus, it appears that students with social anxiety symptoms do not consume more alcohol than other students but they do engage in riskier behaviors and experience more negative consequences than other students when they consume alcohol. Further, researchers have suggested that internal and external influences contribute to the vulnerability of socially anxious college students when they are placed in drinking situations (Buckner, Ecker, & Proctor, 2011; Ham, 2009). Although a range of factors may impact the relationship between social anxiety and negative alcohol-related outcomes, the underlying motivations for this subgroup of students to engage in problematic drinking behaviors has not been fully determined. The college environment is conducive to social settings that involve alcohol use so it is important to understand what factors place students with social anxiety symptoms at greater risk for negative consequences. Thus, the current study examines the degree to which drinking motives mediate the relationship between the social anxiety symptoms and alcohol-related behaviors (i.e., alcohol consumption, harmful drinking, and negative consequences).

Drinking motives have been identified as one of the most proximal indicators of college student drinking patterns (Cooper, 1994; Martens, Ferrier, & Cimini, 2007; Martens, Rocha, Martin, & Serrao, 2008). In considering students with elevated social anxiety symptoms, researchers have reported mixed findings regarding how drinking motives impact the extent to which negative alcohol-related behaviors occur. Although coping and conformity motives have been the most commonly found drinking motives among this subgroup of college students (Ham, Zamboanga, Bacon, & Garcia, 2009; Lewis et al., 2008; Norberg, Olivier, Alperstein, Zvolensky, & Norton, 2011; Stewart et al., 2006; Windle & Windle, 2012), enhancement motives have also been shown to predict similar negative drinking outcomes (Buckner et al., 2006).

Another explanation for these mixed results may include the methodological differences in assessing social anxiety as a unidimensional (Buckner et al., 2006; Clerkin & Barnett, 2012) or a multidimensional construct (Lewis et al., 2008; Norberg, Norton, Olivier, & Zvolensky, 2010; Stewart et al., 2006), as well as the fact that some studies have focused solely on the frequency or quantity of alcohol consumption (Buckner et al., 2006; Ham et al., 2007). Thus, assessing multiple dimensions of social anxiety and both alcohol consumption and harmful drinking may further inform our understanding of the role that drinking motives play in the drinking behaviors of socially anxious college students.

Students’ safe drinking behaviors (i.e., protective behavioral strategies) have not been investigated in relation to social anxiety symptoms. Protective behavioral strategies (PBS) are harm-reduction tactics that are used by college students when they consume alcohol such as planning to stop drinking at a certain time or always leaving the bar with a friend (Martens, Martin, Littlefield, Murphy, & Cimini, 2011). Students who use more PBS tend to experience fewer negative consequences and consume less alcohol (Borden et al., 2011; Delva et al., 2004; Martens et al., 2011). More importantly, PBS have also been shown to mediate and/or moderate the relationship that a range of alcohol-related predictors (e.g., normative influences, outcome expectancies, intrapersonal states) have with both the consumption of alcohol and the consequences of consumption (Lewis, Rees, Logan, Kayser, & Kilmer, 2010; Madson, Moorer, Zeigler-Hill, Bonnell, & Villarosa, 2013). For example, PBS use has been shown to partially mediate the associations that positively reinforcing drinking motives (i.e., social and enhancement motives) have with alcohol consumption and negative consequences even though PBS does not mediate the associations that negatively reinforcing drinking motives (i.e., coping and conformity motives) have with these outcomes (Martens et al., 2007). Recently, Patrick, Lee, and Larimer (2011) found that students who had social, enhancement, or coping drinking motives were less likely to use PBS, whereas students who endorsed conformity drinking motives were more likely to use PBS. These results highlight the importance of the connection between drinking motives and PBS. However, further research is needed to better understand this association for specific types of drinkers (e.g., college students with elevated social anxiety symptoms) and explain why students may or may not use PBS.

Given the mixed literature concerning the associations between social anxiety symptoms and drinking behaviors, the purpose of the current study was to better understand the role that drinking motives may play in the relationships that social anxiety symptoms have with both problematic (i.e., alcohol consumption, harmful drinking, and negative consequences) and safe (i.e., PBS use) drinking behaviors in a sample of college students. To address the methodological differences in the previous literature concerning the assessment of social anxiety and alcohol-related outcomes, we administered two measures of social anxiety symptoms, an alcohol consumption measure, a harmful drinking measure, a negative consequences measure, and a measure of PBS use.

There were three primary goals of the study. First, we hoped to clarify the relationship between social anxiety symptoms and alcohol consumption, harmful drinking, and negative consequences. We predicted that college students with more social anxiety symptoms would report more harmful drinking and negative consequences but not higher levels of alcohol consumption. Second, we examined how different drinking motives impacted the relationship between social anxiety symptoms and alcohol consumption, harmful drinking, and negative consequences. In an attempt to correct for mixed findings in the literature, we administered the revised drinking motives measure that examines the four major drinking motives but we dismantled the “coping motive” into two separate categories—“coping with depression” and “coping with anxiety”—in an attempt to tap into the major cognitive-emotional experiences of individuals who typically drink to cope (Grant, Stewart, O’Connor, Blackwell, & Conrad, 2007). Due to the fact that coping, conformity, and enhancement motives have been found to mediate this relationship in previous research (Buckner et al., 2006; Lewis et al., 2008), we predicted that four of the five drinking motives (i.e., coping with depression, coping with anxiety, conformity, and enhancement motives) would partially mediate the relationships that social anxiety symptoms had with harmful drinking and negative consequences but we did not expect these motives to mediate the association between social anxiety symptoms and alcohol consumption. Third, we wanted to extend previous research by examining the association between social anxiety symptoms and PBS use. Although the use of PBS has not been investigated with socially anxious college students, past research has shown that PBS use is negatively associated with alcohol consumption and negative consequences within the con-
text of drinking motives and alcohol expectancies (Madson et al., 2013; Martens et al., 2007). This led us to predict that students with more social anxiety symptoms would report fewer PBS. We also conducted exploratory analyses to examine the mediating role of drinking motives in the relationship between social anxiety symptoms and PBS use.

**Method**

**Participants and Procedure**

Participants were 532 undergraduates (147 men, 385 women) at a university in the southern region of the United States who were enrolled in psychology courses and participated in return for partial fulfillment of a research participation requirement. Participants completed measures via a secure web site concerning social anxiety symptoms, drinking motives, protective behavioral strategies used when consuming alcohol, amount of alcohol consumed, harmful drinking, and negative consequences associated with alcohol use. The two criteria for participating in the present study were that the individuals had to be between the ages of 18 and 25 (the average age for our participants was 19.72 years; SD = 1.65) and must have consumed alcohol within the past 30 days. The racial/ethnic composition was 58% White, 38% Black, and 4% Other. These demographic characteristics are representative of the undergraduate population at the university from which the participants were recruited.

**Measures**

**Social anxiety symptoms.** Social anxiety symptoms were assessed using Mattick and Clarke’s (1998) Social Interaction Anxiety Scale (SIAS) and Social Phobia Scale (SPS). The SIAS assesses anxiety revolving around interacting with others (20 items; e.g., “I have difficulty making eye-contact with others;” α = .93). The SPS assesses performance-like anxiety such as anxiety about being watched by others (20 items; e.g., “I get nervous that people are staring at me as I walk down the street;” α = .94). Respondents for both instruments are asked to indicate the degree to which each item is characteristic of themselves using scales that range from 0 (not at all) to 4 (extremely). Higher scores on each instrument indicate greater social anxiety symptoms. The SIAS and SPS have shown excellent construct validity and test–retest reliability (r = .92 and .93, respectively; Mattick & Clarke, 1998). Given that the SIAS and SPS were developed as companion measures (Mattick & Clarke, 1998) and that they were highly correlated with one another in this study (r = .76), a total social anxiety score was calculated by centering and combining the SIAS and SPS (Ham & Hope, 2006). Internal consistency for the combined social anxiety measure was .95.

**Drinking motives.** Drinking motives were assessed using the 28-item Modified Drinking Motives Questionnaire (MDMQ; Grant et al., 2007). Respondents were asked to indicate how often they consume alcohol for a particular reason using scales ranging from 1 (almost never) to 5 (almost always). The MDMQ consists of five subscales: social motives (five items; e.g., “as a way to celebrate;” α = .79), enhancement motives (five items; e.g., “makes me feel good;” α = .85), conformity motives (five items; e.g., “to fit in with a group I like;” α = .92), coping with depression motives (nine items; e.g., “to forget painful memories;” α = .95), and coping with anxiety motives (four items; e.g., “to reduce my anxiety;” α = .81). Grant, Stewart, O’Connor, Blackwell, and Conrad (2007) have demonstrated good validity and reliability of the MDMQ by conducting confirmatory factor analyses (comparing model fit of the four- vs. five-factor structure), correlation analyses with drinking frequency (i.e., concurrent validity), and conducting Cronbach’s Alpha and test–retest reliability analyses.

**Protective behavioral strategies.** The use of protective behavioral strategies was assessed by using the 15-item Protective Behavioral Strategies Scale (PBSS; Martens et al., 2005). The PBSS asks participants to “indicate the degree to which you engage in the following behaviors to keep yourself safe when using alcohol or partying.” Participants responded to each item using scales that ranged from 1 (never) to 6 (always) for behaviors such as using a designated driver or alternating between alcoholic and nonalcoholic drinks. Scores range from 15 to 90 with higher scores indicating greater use of PBS. The reliability and validity of score on the PBSS has been demonstrated among college student drinkers (Benton et al., 2004; Martens et al., 2005; Martens, Pedersen, LaBrie, Ferrier, & Cimini, 2007). The internal consistency with this sample was α = .92.

**Amount of alcohol consumed.** Alcohol consumption was assessed using the Daily Drinking Questionnaire (DDQ; Collins, Parks, & Marlatt, 1985). The DDQ identifies the amount of alcohol consumed by respondents by asking them to report their drinking behavior for the past week. The total number of standard alcoholic drinks consumed during the past week was calculated by summing the number of drinks reported for each day. Scores for the DDQ have been found to be associated with other instruments designed to measure the amount of alcohol consumed such as the Drinking Practices Questionnaire (Collins et al., 1985).

**Harmful drinking patterns.** The Alcohol Use Disorders and Identification Test (AUDIT; Saunders, Aasland, Babor, De La Fuente, & Grant, 1993) is a 10-item instrument that assesses harmful drinking patterns (e.g., “How often do you have six or more drinks on one occasion?”). The AUDIT is the gold standard for the detection of early phase risky drinking patterns across different cultures and age groups including college students (e.g., Kokotailo et al., 2004). Higher scores indicate more harmful drinking patterns with a clinical cutoff score of 8 for college students indicating harmful drinking (Devos-Comby & Lang, 2008). The internal consistency for the AUDIT was α = .83 for the present study.

**Negative consequences of drinking.** The negative consequences of alcohol consumption were measured using the brief version of the Rutgers Alcohol Problem Index (RAPI; Earleywine, LaBrie, & Pedersen, 2008). The RAPI is a 23-item measure designed to assess negative alcohol-related consequences. Participants rate how often they have experienced a specific negative consequence such as “neglected your responsibilities;” and “missed a day, or part of a day, of school or work” within the past year using scales ranging from 0 (never) to 4 (more than 10 times). The total score ranges from 0–92 with higher scores indicating more negative consequences. The RAPI has been shown to be reliable and valid measure with college students (Neal, Corbin, & Fromme, 2006). The internal consistency for this sample was α = .94.
Data Analytic Approach

A multiple mediation analysis within a structural equation model (SEM) framework was performed using Mplus 7.11 (Muthén & Muthén, 2012) to determine the extent to which drinking motives mediated the relationships between social anxiety symptoms and alcohol use behaviors (i.e., alcohol consumption, harmful drinking, negative consequences, and PBS use). The major advantages of using a SEM framework over univariate or multiple regression analyses include the ability to account for shared variance with multiple mediators and all outcome variables entered simultaneously, the fact that data does not need to be normally distributed, and the use of fewer inferential tests which reduces the likelihood of a Type I error (Schumacker & Lomax, 2004). To correct for our skewed data, Preacher and Hayes (2004) recommend using a bootstrapping technique to conduct the multiple mediation analysis (i.e., bootstrapping is a nonparametric approach to effect-size estimation that makes no assumptions about the shape of the distribution of the sample). The bootstrapping approach involved the extraction of 5,000 resamples with the mediational effect being calculated for each of these resamples. In order to obtain the percent mediated (i.e., the percent of variance in the outcome variable that is accounted for by the mediators) the product of Paths a and b for each mediator were divided by Path c (Preacher & Hayes, 2004). We predicted only partial mediation because full mediation requires the direct relationship between the predictor and criterion to reduce to zero once the mediator variable is entered, whereas partial mediation only requires a reduction in value between predictor and criterion, but it is still different from zero (Baron & Kenny, 1986). As with most psychological research, it is improbable to assume only one variable (e.g., conformity drinking motive) would explain the relationship that social anxiety symptoms have with the alcohol-related outcomes. Finally, due to the inconsistent results of previous studies regarding the direct relationships social anxiety had with negative alcohol use behaviors, the lack of research on the relationship between social anxiety and PBS use, and the ability to examine multivariate effects within an SEM framework, we decided to keep the four outcome variables separate in the multiple mediation model.

Results

Means, standard deviations, and intercorrelations for the measures are presented in Table 1. Results from the AUDIT indicated 23 participants reported drinking alcohol four or more times a week and 164 reported having six drinks or more on one occasion at least monthly which is indicative of heavy episodic drinking. Overall, 208 participants (36% of the sample) exceeded the clinical cutoff (score ≥ 8) for college students on the AUDIT which indicates a significant risk for developing alcohol-related problems (Devos-Comby & Lang, 2008). Social anxiety had a positive association with harmful drinking (r = .19, p < .01) and negative consequences (r = .32, p < .01) as well as a negative association with PBS (r = −.10, p < .05). Social anxiety symptoms were not directly related to alcohol consumption.

Structural Equation Model

Global fit statistics. The multiple-mediation model that we examined included social anxiety symptoms as the predictor variable, alcohol use behaviors as the four different criterion variables (i.e., alcohol consumption, harmful drinking, negative consequences, and PBS), and the five drinking motives entered as mediators. All significant direct effects are displayed in Figure 1. Due to the fact that the degrees of freedom for the model is zero—primarily a result of correlating the disturbance terms of the five drinking motives, and also among the four alcohol-related outcome variables (see Table 2), the current model is described as just identified wherein parameter estimates are identified, but global fit statistics are not reported. Because the mediators and outcome variables should have moderate to strong correlations among themselves, it makes theoretical sense to account for their relationship. The total (c), direct (c’), and indirect parameter estimates will be reported by alcohol-related outcome (see Table 3).

Social anxiety symptoms and alcohol consumption. The first set of parameters examined the mediating effects of the five drinking motives on the relationship between symptoms of social anxiety and alcohol consumption. Although the total and direct relationship between social anxiety and alcohol consumption was not significant (c = .05, ns and c’ = −.01, ns; see Table 2), there was a significant indirect relationship found with enhancement motives (β = .04, p = .02; see Figure 1). Specifically, social anxiety symptoms predicted an increase in enhancement motives (a = .13 p < .05) and enhancement motives predicted an increase in alcohol consumption (b = .27, p < .001). The bootstrap results indicate a significant indirect effect when the 95% confidence interval does not contain zero, CI [.01, .07]. These results suggest that enhancement motives have an indirect effect on the relationship between social anxiety symptoms and alcohol consumption (i.e., while those with more social anxiety symptoms are not consuming more alcohol, they are more likely to drink for enhancement motives and those who drink for enhancement motives are consuming more alcohol).

Social anxiety symptoms and harmful drinking. The second set of parameters examined the mediating effects of the five drinking motives on the relationship between social anxiety symptoms and harmful drinking. The results of this analysis are presented in Table 2. This approach revealed that social anxiety was positively related to harmful drinking (c = .19, p < .01) such that students reporting more symptoms of social anxiety reported more harmful drinking. After including the drinking motives in the model, the direct relationship between social anxiety symptoms and harmful drinking was reduced (c’ = .08, p = .05). Further, enhancement motives were the only significant partial mediator of the relationship between social anxiety symptoms and harmful drinking (β = .05, p = .01) which accounted for 25% of the mediated effect (see Figure 1). Although the percent mediated appears large, the change from the total (c) to the direct (c’) effect after including enhancement motives in the relationship is .11, which is a medium effect size and likely due to the lower Beta values (Preacher & Kelley, 2011). Therefore, social anxiety symptoms predicted an increase in enhancement motives (a = .13, p < .01). In turn, enhancement motives predicted an increase in harmful drinking (b = .35, p < .001) such that students drinking to

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1 We conducted separate multiple mediation analyses with the two social anxiety measures separately but no differences were found in the two models.
Means, Standard Deviations, and Intercorrelations of Measures

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<td>MDMQ-enhancement</td>
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<td>.32**</td>
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Note. MDMQ = Modified Drinking Motives Questionnaire; DDQ = Daily Drinking Questionnaire; PBSS = Protective Behavioral Strategies Survey; RAPI = Rutgers Alcohol Problem Index; AUDIT = Alcohol Use Disorders and Identification Test.

*p < .05. **p < .01.

increase their positive mood are reporting more harmful drinking. The bootstrap results indicate significant mediation when the 95% confidence interval for the indirect effect does not contain zero, CI [.01, .08]. These results suggest that enhancement motives mediate the relationship between social anxiety symptoms and harmful drinking (i.e., those with more social anxiety symptoms are more likely to drink for enhancement motives which is related to more harmful drinking).

Social anxiety symptoms and negative consequences. The third set of parameters examined the mediating effects of the five drinking motives on the relationship between social anxiety symptoms and negative consequences. The results of this analysis are presented in Table 2. This approach revealed that social anxiety was positively related to negative consequences (r = .30, p < .01) such that students reporting more symptoms of social anxiety were reporting more negative consequences. The inclusion of drinking motives in the model reduced the direct relationship between social anxiety symptoms and negative consequences (c' = .15, p < .01), accounting for 44% of the mediated effect and an absolute change value of .15, which is a medium effect size. Specifically, enhancement and conformity motives were the only significant partial mediators of the relationship between social anxiety symptoms and negative consequences with conformity motives (β = .11, p < .01) accounting for 35% and enhancement motives (β = .03, p < .01) accounting for 9% of the mediated effect (see Figure 1). In terms of conformity motives, social anxiety symptoms predicted an increase in conformity motives (a = .36, p < .001) such that students with more social anxiety symptoms are drinking to be accepted by their peers. In turn, conformity motives predicted an increase in negative consequences reported (b = .29, p < .001) such that students drinking to be accepted by their peers reported more negative consequences. In terms of enhancement motives, more social anxiety symptoms predicted an increase in enhancement motives (a = .13, p < .01)

Table 2

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<td>1. Social motives</td>
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Alcohol-related outcomes

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Note. All correlation coefficients are significant (p < .01), and provide justification for correlating the five drinking motive variables and the four alcohol-related outcome variables in the conceptual model. DDQ = Daily Drinking Questionnaire; AUDIT = Alcohol Use Disorder Identification Test; RAPI = Rutgers Alcohol Problem Index; PBSS = Protective Behavioral Strategies-Survey.
which, in turn, predicted an increase in negative consequences reported \( (b = .21, p < .001) \) such that students drinking to increase their positive mood are reporting more negative consequences. The bootstrap results indicate significant mediation when the 95% confidence interval for the indirect effect does not contain zero \( (-.09, -.01) \). These results suggest that students with more social anxiety symptoms may experience more negative consequences when they drink (Buckner et al., 2006; Ham & Hope, 2006; Stewart et al., 2006). One potential explanation for this finding is that students with more social anxiety symptoms may be susceptible to their observations of the drinking habits of other students. Ham and Hope (2006) found that descriptive drinking norms mediated the relationship between social anxiety and alcohol consumption with those higher in social anxiety symptoms who endorsed higher descriptive norms reporting more alcohol consumption. Thus, the increased harmful drinking and negative consequences reported by students with more social anxiety symptoms in our sample may stem from their decision to consume alcohol based on the amount of alcohol they believe their peers to be consuming.

A second goal of this project was to evaluate the mediating effects of drinking motives on the link between social anxiety symptoms and alcohol-related outcomes. Only enhancement motives mediated the relationships that social anxiety symptoms had with harmful drinking, whereas enhancement and conformity motives mediated the association that social anxiety symptoms had with negative consequences. These results support previous findings suggesting that if students with social anxiety symptoms are placed in a social context that allows for alcohol consumption, they may decide to drink to experience positive mood and make the best out of the social situation (Buckner et al., 2006; Ham et al., 2009; Norberg et al., 2011). For example, Buckner, Schmidt, and Eggston (2006) found that students with elevated social anxiety symptoms who drank for enhancement motives reported more negative drinking behaviors; however, these students did not endorse drinking situations that included pleasurable emotions or pleasant experiences with others. The researchers concluded that these students may have decided to drink in order to experience positive mood instead of drinking to increase their positive mood. Contrary to our prediction, drinking motives did not mediate the relationship between social anxiety and alcohol consumption. However, enhancement motives did have an indirect effect on the social

### Table 3

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<th>Total, Direct, and Indirect Effects of Social Anxiety on Alcohol-Related Outcomes</th>
<th>DDQ</th>
<th>AUDIT</th>
<th>RAPI</th>
<th>PBSS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent variable ( \beta )</td>
<td>( p ) ( \beta )</td>
<td>( p ) ( \beta )</td>
<td>( p ) ( \beta )</td>
<td>( p ) ( \beta )</td>
</tr>
<tr>
<td>Independent variable: Social anxiety</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Total effect</td>
<td>.05</td>
<td>.00</td>
<td>.19</td>
<td>.00</td>
</tr>
<tr>
<td>Direct effect</td>
<td>-.01</td>
<td>.87</td>
<td>.08</td>
<td>.05</td>
</tr>
<tr>
<td>Total indirect</td>
<td>.06</td>
<td>.01</td>
<td>.11</td>
<td>.00</td>
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<tr>
<td>Specific indirect effects Social motives</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Conformity motives</td>
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<td>.52</td>
<td>-.00</td>
<td>.80</td>
</tr>
<tr>
<td>Enhancement motives</td>
<td>.04</td>
<td>.02</td>
<td>.05</td>
<td>.01</td>
</tr>
<tr>
<td>Cope—anxiety motives</td>
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<td>.35</td>
<td>-.02</td>
<td>.45</td>
</tr>
<tr>
<td>Cope—depression motives</td>
<td>.05</td>
<td>.06</td>
<td>.01</td>
<td>.79</td>
</tr>
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</table>
| Note. All parameter estimates and significance test are based on 5,000 bootstrapped samples. Significant effects \( (p < .05) \) are bolded. DDQ = Daily Drinking Questionnaire; AUDIT = Alcohol Use Disorders Identification Test; RAPI = Rutgers Alcohol Problem Index; PBSS = Protective Behavioral Strategies Survey.

**Discussion**

The purpose of this study was to better understand the associations that social anxiety symptoms had with alcohol-related outcomes \( (i.e., \) alcohol consumption, harmful drinking, negative consequences, PBS use) as well as examining the mediating effects of drinking motives in these associations. The first goal of this study was to examine the direct relationship between social anxiety symptoms and negative drinking behaviors \( (i.e., \) alcohol consumption, harmful drinking, negative consequences). As predicted, students with more social anxiety symptoms reported more harmful drinking and negative consequences but did not report greater alcohol consumption. These results are consistent with previous studies showing that students with more social anxiety symptoms are not consuming more alcohol than their less socially anxious peers but they do experience more negative consequences when they drink (Buckner et al., 2006; Ham & Hope, 2006; Stewart et al., 2006).
anxiety-alcohol consumption relationship. Thus, although students with social anxiety symptoms do not report more alcohol consumption, they are reporting drinking for enhancement motives, and students drinking for enhancement motives are reporting more alcohol consumption. In an attempt to provide clarity to this inconsistent relationship, our findings indicate that the most proximal predictor of drinking behavior (i.e., drinking motives) does not establish a relationship between students with social anxiety symptoms and alcohol consumption, and that focus should transition from alcohol consumption to harmful drinking experiences among this subgroup.

Our finding that students with elevated social anxiety symptoms who were drinking to avoid rejection from others (i.e., conformity motives) experienced more negative consequences is consistent with previous findings (Lewis et al., 2008; Stewart et al., 2006). Although we expected conformity motives to also mediate the relationship between social anxiety symptoms and harmful drinking, it appears that students who drink to conform or avoid rejection are more likely to experience negative consequences regardless of the amount of alcohol they consume (Lewis et al., 2008; Norberg et al., 2010). Another potential explanation for the current findings may be the large number of female participants. Norberg, Norton, Olivier, and Zvolensky (2010) found that although both men and women with social anxiety symptoms reported drinking for enhancement motives, women with elevated levels of social anxiety reported more negative consequences when they were drinking to conform to others. Thus, the demographic characteristics of the sample may have influenced these results.

Surprisingly, coping drinking motives did not mediate the relationships that social anxiety symptoms had with harmful drinking or negative consequences. It has been demonstrated that students with elevated social anxiety symptoms who drank to cope with negative affect consumed more alcohol and experienced more negative consequences (Ham et al., 2007; Ham et al., 2009; Stewart et al., 2006). Unlike previous researchers, we used the MDMQ that separated the coping drinking motives into two subscales: coping with anxiety and coping with depression. Thus, dividing the coping motives subscale may have reduced the potential mediating effect coping motives had on the link between social anxiety and these drinking behaviors. However, after combining the two coping motives subscales, coping motives was still not a significant mediator of the relationships social anxiety symptoms had with any of the alcohol-related behaviors. Another potential explanation for these findings involves the extent to which social anxiety symptoms were reported among the current sample. Specifically, most participants reported either a few or an average number of social anxiety symptoms. Previous researchers who have found coping motives to mediate the relationship social anxiety has with alcohol-related outcomes have commonly dichotomized students into high and low social anxiety groups. With the focus of the current study on how varying degrees of social anxiety symptoms impact students’ drinking patterns, it may be that students’ decision to drink alcohol stems from the severity of their social anxiety symptoms. Specifically, students experiencing a large number of social anxiety symptoms may resort to drinking to manage their negative affect, whereas students with average social anxiety symptoms are more apt to drink in order to make the best out of the social situation and to experience positive affect.

The final goal of the current study was to build on the use of safe drinking behaviors by looking at the link between social anxiety and protective behavioral strategy use. Results indicated that students with more social anxiety symptoms reported using fewer PBS. Furthermore, students with more social anxiety symptoms who were drinking for enhancement motives reported using fewer PBS. Although previous researchers have not explored the role of social anxiety symptoms on PBS use, this finding is similar results that students reporting more alcohol consumption, harmful drinking, and negative consequences also reporting fewer PBS used (Madson et al., 2013; Martens et al., 2011). Further, Martens, Ferrier, and Cimini (2007) demonstrated that students who drank for positively reinforcing motives—such as enhancement—engaged in fewer PBS, consumed more alcohol, and experienced more negative consequences. Thus, similar to college students in general, students with elevated social anxiety symptoms who are focused on positive experiences in the social situation would avoid engaging in behaviors that may disrupt that experience. However, this need for positive experiences in drinking situations—which are largely social in the college environment—may further reduce safe drinking practices for students with more social anxiety symptoms.

The current findings have important implications for prevention and intervention efforts with college students who experience social anxiety symptoms and consume alcohol. First, our results lend further support to the use of a comprehensive and multidimensional assessment of social anxiety and alcohol use in order to understand the overall drinking patterns of college students (Ham et al., 2009). Thus, defining and measuring the multidimensional components of social anxiety and alcohol use may help clarify what psychosocial or drinking-related factors may also contribute to these students’ problematic drinking patterns and better inform interventions. Second, increased social anxiety symptoms have been identified as a factor that may explain reduced effects of screening and brief interventions programs (Terlecki, Buckner, Larimer, & Copeland, 2011). Thus, programs such as the Brief Alcohol Screening and Intervention for College Students (BASICS; Dimeff, Baer, Kivlahan, & Marlatt, 1999) may benefit from including discussions on the emotional state of socially anxious individuals when placed in social situations and how these states may relate to their drinking motives and resulting behaviors. Finally, as the first study to explore PBS use and symptoms of social anxiety, our results suggest that those working with college drinkers who have elevated symptoms of social anxiety may want to consider incorporating PBS use into these discussions (Martens et al., 2007) as well as how their drinking motives may influence their safety when they are drinking (e.g., enhancement motives may lead individuals to consume more alcohol than they can effectively manage). By discussing the variety of PBS that students can use when placed in drinking situations, these students can learn how to continue to experience a positive mood while being safe when drinking.

Although our results extend what is known about the connection between drinking behaviors and social anxiety symptoms, it is important to acknowledge some of the limitations of this study. First, it is unclear whether these results will generalize to other populations because data were collected from a single institution in the southeastern region of the United States. College students in this region typically consume less alcohol than students in other
Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable the importance of considering the role of social anxiety in harm reduce the value of PBS use by these students. Our results support positive mood or to conform to their peers. Additionally, we social anxiety symptoms decide to drink, they appear to do so in alcohol-related outcomes. In particular, when students with more social anxiety symptoms are connected to alcohol consumption and alcohol-related negative consequences among college students with elevated social anxiety symptoms. Future research should consider a longitudinal design that could assess changes in drinking motives and drinking patterns among students with social anxiety symptoms as they progress through the college years.

The results of the current study also suggest areas for further investigation. Future research should consider the drinking context in relation to social anxiety, drinking motives, and drinking pattern behaviors (Buckner et al., 2006). The role of other psychosocial drinking and related variables such as perceived drinking norms and alcohol outcome expectancies should be considered because they are factors that influence drinking patterns among socially anxious students (Terlecki et al., 2011). Finally, as the first study to assess the impact of social anxiety symptoms on college students’ safe drinking behaviors, additional research is needed to better understand the role that social anxiety plays on students’ use of PBS and how prevention and intervention specialists on college campuses can better teach students to use them. For instance, invariance testing could be used to assess the degree to which our findings are consistent across gender and race.

In sum, our results allow for a better understanding of the manner in which social anxiety symptoms are connected to alcohol-related outcomes. In particular, when students with more social anxiety symptoms decide to drink, they appear to do so in more problematic ways, particularly when they drink to experience positive mood or to conform to their peers. Additionally, we identified a motivational factor, enhancement motives, that may reduce the value of the PBS use by these students. Our results support the importance of considering the role of social anxiety in harm reduction efforts for college student drinkers.

References


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