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Brief Motivational Intervention for College Drinking: The Synergistic Impact of Social Anxiety and Perceived Drinking Norms

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Abstract

Despite the efficacy of *Brief Alcohol Screening and Intervention for College Students* (BASICS), students with higher social anxiety appear vulnerable to poorer outcomes. A possible explanation for these outcomes is that corrective normative feedback (an active component of BASICS) may be less effective for socially anxious students if their beliefs about others' drinking are less malleable due to intense fear of negative evaluation for deviating from perceived drinking norms. This study evaluated whether socially anxious students demonstrated less change in perceived norms during BASICS. We also examined whether change in norm endorsement moderated the relation between social anxiety and BASICS outcomes. Undergraduates ($N = 52$) who underwent BASICS completed measures of drinking, social anxiety, and perceived norms at baseline and 4-weeks post-BASICS. Higher social anxiety was related to less change in norm endorsement after receiving BASICS. Change in perceived norms during treatment moderated the relation between social anxiety and follow-up drinking. Among students with smaller change in norm endorsement after BASICS, higher social anxiety was related to heavier follow-up drinking. Among students with greater changes to norm endorsement during BASICS, the effect of social anxiety was non-significant. Results suggest that corrective perceived norms interventions may be less effective among socially anxious students, contributing to continued heavy drinking. Development of social anxiety-specific BASICS components warrants attention.

Keywords

alcohol; brief motivational intervention; social anxiety; social norms; college students

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Heavy drinking in college is concerning because it can mark the development of chronic and problematic alcohol use (including alcohol dependence) among vulnerable individuals (Jackson, Sher, Gotham, & Wood, 2001; Merline, O'Malley, Schulenberg, Bachman, & Johnston, 2004). Students who drink heavily are more likely to experience serious academic and psychosocial problems while in school as well as serious alcohol-related health problems after graduating (e.g., alcohol dependence and liver failure; Johnston, O'Malley, Bachman, & Schulenberg, 2008). The *Brief Alcohol Screening and Intervention for College Students* (BASICS; Dimeff, Baer, Kivlahan, & Marlatt, 1999) is a brief intervention with strong empirical support designed to decrease heavy drinking and alcohol problems among college students (Larimer & Currence, 2002; 2007). Yet, despite BASICS' efficacy, variability in outcomes exists. Identification of characteristics related to poorer outcomes could inform personalized refinements of BASICS protocols for vulnerable students.

Students with elevated social anxiety are one such vulnerable subgroup. Socially anxious college students experience more alcohol-related problems (Buckner, Ecker, & Proctor, 2011; Buckner, Eggleston, & Schmidt, 2006; Buckner & Heimberg, 2010; Gilles, Turk, & Fresco, 2006; Lewis & O'Neill, 2000) and exhibit poorer outcomes following BASICS (Terlecki, Buckner, Larimer, & Copeland, 2011). Prior work showed that social anxiety moderated the relation between treatment type (BASICS vs. assessment only control) and outcomes such that students in BASICS with higher social anxiety reported the heaviest typical alcohol consumption after receiving treatment (Terlecki et al., 2011).

It is therefore important to determine what factors contribute to poorer BASICS outcomes among this vulnerable group. The answer may lie at least partially in the nature of social anxiety itself. Social anxiety is characterized by fear or avoidance of social scrutiny and/or intense or persistent fear surrounding social interactions (American Psychiatric Association [APA], 2000). Individuals with elevated social anxiety may drink alcohol to avoid scrutiny from alcohol-using peers and/or because they believe drinking is a common (and thus socially acceptable) strategy for dampening anxiety in social situations. In partial support of this hypothesis, social anxiety has also been found to moderate the relation between perceived norms and drinking behaviors, such that students with higher social anxiety and higher perceived norms consumed more drinks per week (Neighbors et al., 2007). Elevated social anxiety is also related to consuming alcohol in response to social pressure to drink (Buckner et al., 2006) as well as to avoid social scrutiny and to socialize (Stewart, Morris, Mellings, & Komar, 2006).

Taken together, these data suggest that socially anxious students may not respond as well to BASICS because of the strong beliefs they may have about others' drinking and their fear that they may be evaluated for not conforming to what they perceive is normative drinking behaviors. In samples unselected for social anxiety, students' perception of average peer drinking is exaggerated (Baer, Stacy, & Larimer, 1991; Perkins & Berkowitz, 1986) and students with larger misperceptions consistently report higher rates of alcohol use (Baer et al., 1991; Borsari & Carey, 2003; Neighbors, Lewis, Bergstrom, & Larimer, 2006). One of the ways BASICS is thought to improve drinking behavior is by addressing misperceptions of peer drinking behavior via the provision of comparative normative feedback. The aim of comparative normative feedback is to challenge the belief that the average student drinks heavily, thereby reducing heavy drinking driven by the need to "keep up with the norm."

Corrective normative feedback is an effective stand-alone intervention for reducing college drinking (Neighbors, Larimer, & Lewis, 2004; Neighbors, Lewis, Atkins, Jensen, Walter et al., 2010). The degree of change in perceived drinking norms during treatment has been found to mediate (Neighbors, Lewis, et al., 2006) or partially mediate (Carey, Henson, Carey, & Maisto, 2010) the effect of treatment. However, the effectiveness of normative

feedback might be compromised among socially anxious students whose normative beliefs about drinking may be less malleable due to a strong fear of being judged or ridiculed for not behaving according to the perceived 'norm'. To date, we know of no research examining whether the provision of normative feedback impacts normative beliefs among socially anxious students. Also, it is unknown whether normative beliefs impact BASICS outcomes among socially anxious students.

The current study sought to elucidate the nature of poorer BASICS outcomes among socially anxious students in two ways. First, we examined whether social anxiety was negatively related to change in perceived norms after receiving BASICS. Second, we extended our finding that socially anxious students reported heavier drinking post-BASICS than less anxious students (Terlecki et al., 2011) by testing whether change in perceived norms moderated the relation between social anxiety and post-BASICS drinking. We hypothesized that socially anxious students with less change in perceived norms during BASICS would exhibit the heaviest post-treatment drinking.

Method

Participants

Data for the present study concern a subset of heavy drinking undergraduate students aged 18 to 24 who completed BASICS ($N = 52$) as part of a larger alcohol intervention study (Terlecki et al., 2011; Terlecki, Larimer, & Copeland, 2010). Inclusion criteria for the larger study were (a) consuming more than 4/5 drinks per occasion (women/men); (b) endorsing at least three alcohol-related problems on more than three occasions within the past three years; and (c) endorsing hazardous drinking (scores exceeding six) on the *Alcohol Use Disorder Identification Test* (AUDIT; Saunders, Aasland, Babor, & de la Fuente, 1993). The subgroup reported herein consists of those students randomized to BASICS who completed baseline and follow-up assessments. This subgroup was not selected based on social anxiety characteristics. This subsample had a mean age of 20.38 years ($SD = 1.46$) and was 90.6% White, 67.9% male, 56.6% upper classmen, 66.0% off-campus residents, and 32.1% Greek system members. Half (51.9%) were referred from the university's Office of Judicial Affairs and 48.1% volunteered to participate via the university's research participant pool.

Measures

The *Quantity/Frequency/Peak Index* (QFI; Dimeff et al., 1999) was used to assess typical alcohol consumption using one item on which participants rated their typical drinking on one occasion during the past month using scale from 1 (*0 drink*), 2 (*1–2 drinks*), 3 (*3–4 drink*), and so on to 11 (*more than 19 drinks*). The QFI is effective in measuring changes in drinking patterns (Marlatt, Baer, & Larimer, 1995).

The *Drinking Norms Rating Form* (DNRF; Baer et al., 1991) was used to assess perceptions of normative peer alcohol use. One item on the measure (item 9) concerns the number of alcoholic drinks students perceive a university student consumes on a typical drinking occasion during the past month from 1 (*0 drink*) to 11 (*more than 19 drinks*). The DNRF is widely used and has demonstrated good test-retest validity in college students (Neighbors, Dillard, Lewis, Bergstrom, & Neilt, 2006).

The *Social Phobia Scale* (SPS) and the *Social Interaction Anxiety Scale* (SIAS; Mattick & Clarke, 1998) assessed social anxiety. Each measure includes 20 items scored on a 5-point Likert scale ranging from 0 (*not at all characteristic or true of me*) to 4 (*extremely characteristic or true of me*). These widely used measures have demonstrated good internal consistency across community and student samples (Heimberg, Mueller, Holt, Hope, & Leibowitz, 1992; Mattick & Clarke, 1998; Weeks, Heimberg, Fresco, Hart, Turk et al.,

2005). The measures also demonstrate specificity for social anxiety (Brown, Turovsky, Heimberg, Juster, Brown et al., 1997). In the current sample, the internal consistencies of the SIAS ($\alpha = .90$), SPS ($\alpha = .92$), and the combined SIAS-SPS ($\alpha = .91$) were excellent.

The *Spielberger Trait Anxiety Inventory* (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983) was used to measure trait anxiety. The measure demonstrates excellent reliability and convergent validity and individuals with anxiety disorders score significantly higher than do nonclinical participants (Spielberger et al., 1983). In the current sample, the STAI demonstrated good internal consistency ($\alpha = .87$).

Procedure

Baseline Assessment—Participants met individually with the study therapist (a master's level clinical doctoral student under the clinical supervision of the third and fourth authors) to complete baseline measures. Participants were asked to monitor their drinking for approximately two weeks between the baseline and feedback appointments.

BASICS—This intervention (Dimeff et al., 1999) consisted of one 50-minute individual meeting during which the study therapist presented and reviewed a personalized graphic feedback form generated from the participant's baseline data. The feedback form was used to elicit an open-ended conversation about the participant's drinking behavior that included a discussion of a normative comparison graph of actual versus perceived drinking behavior. The intervention's purpose is to build awareness of the problematic nature of heavy alcohol use, develop discrepancy between actual and desired alcohol use behavior, and correct the misperception that most students drink heavily.

Follow-up assessment—Four-weeks after the BASICS appointment, participants completed online measures of alcohol use (QFI) and perceived norms (DNRF). Volunteer participants who completed the follow-up assessment received extra credit toward psychology courses. Mandated participants received a letter indicating completion of disciplinary requirements.

Results

Sample Characteristics

There were no differences between study completers and non-completers on baseline measures of social anxiety, typical drinking, or drinking norms endorsement. There were no baseline differences between referral groups (mandated vs. voluntary) for social anxiety, $F(1,51) = 0.41$, $p = .53$, $d = .18$; trait anxiety, $F(1,51) = 0.34$, $p = .56$, $d = .17$; or typical alcohol consumption $F(1,51) = 0.28$, $p = .60$, $d = .15$. Mandated students reported higher baseline perceived drinking norms ($M = 4.59$, $SD = 1.01$) relative to voluntary students ($M = 3.72$, $SD = 1.10$), $F(1,51) = 8.90$, $p < .01$, $d = .84$. Referral group was included as a covariate to account for these differences.

Means and standard deviations of continuous variables are presented in Table 1. At baseline, social anxiety was significantly, positively correlated with trait anxiety, perceived norms, and typical drinks. Further, baseline social anxiety was significantly, positively correlated with perceived norms and typical drinks at follow-up. Typical drinks scores were normally distributed with skew of 0.91 ($SE = 0.33$) and kurtosis 0.91 ($SE = 0.65$).

Change in Normative Beliefs: Relation to BASICS Outcomes

To examine whether change in normative beliefs during BASICS was related to BASICS outcomes, a linear regression was conducted using norms change score (baseline norms –

follow-up norms) as a predictor variable, with baseline typical drinking quantity, referral group, gender, and trait anxiety as covariates. Less change in perceived norms was related to heavier follow-up typical drinking, $\beta = -.28$, $t = -2.21$, $p < .05$, $pr = -.31$, $f^2 = .12$.

Is Social Anxiety Related to Less Change in Perceived Norms during BASICS?

As hypothesized, baseline social anxiety was negatively correlated with change in perceived norms during BASICS (Table 1). This relationship remained after controlling for referral group, gender, and trait anxiety, $\beta = -.41$, $t = -2.52$, $p < .05$, $pr = -.35$, $f^2 = .13$.

Does Change in Perceived Norms Moderate the Relation between Social Anxiety and BASICS Outcomes?

Next we evaluated whether change in perceived norms moderated the relationship between social anxiety and post-BASICS drinking. The dependent variable was typical drinks, a categorical variable. Regression models for categorical variables can be constructed using the same analytic method as for continuous variables, provided the categorical variable has a large number of response categories (i.e., 5 or more; Torra, Domingo-Ferrer, Mateo-Sanz, & Ng, 2006). Given that the dependent variable (typical drinks) consisted of 11 response categories, a hierarchical linear regression was conducted. Predictor variables were: Step 1: drinking quantity, trait anxiety, referral group, and gender; Step 2: baseline social anxiety and perceived norms change score; and Step 3: the social anxiety X perceived norms interaction. This approach reduced the likelihood that any observed effect for the interaction term was due to shared variance with the variables in Steps 1 and 2 (Cohen, Cohen, West, & Aiken, 2003). Variables entered in Steps 2 and 3 were centered to reduce multicollinearity (Tabachnick & Fidell, 2007). As predicted, change in perceived norms during BASICS moderated the relation between social anxiety and follow-up typical drinking (Table 2). To probe the nature of this significant interaction, tests of simple slopes were conducted using the strategy suggested by Aiken & West (1991) and Holmbeck (2002). Among students with smaller changes in norm endorsement, high social anxiety group membership¹ was associated with heavier follow-up typical drinking ($\beta = .56$, $t = 3.07$, $p < .01$). Among students with larger changes in norm endorsement, the effect of social anxiety group was not significant² ($\beta = -.01$, $t = -.01$, $p = .99$). The regression lines are plotted in Figure 1 using 1 SD above or below the mean for respective norms change variable and clinical cut-scores for social anxiety¹ (Aiken & West, 1991; Cohen et al., 2003). An alternate data analysis using multinomial logistic regression is presented³.

Discussion

The current study identified one factor (i.e., beliefs about others' drinking) that appears related to the poorer alcohol treatment outcomes observed among high social anxiety

¹High and low social anxiety groups were determined using an empirically derived clinical cut-score on the SIAS measure (see Heimberg et al., 1992). Scores one standard deviation above the Heimberg et al. community SIAS mean ($M = 19.9$, $SD = 14.2$) identified 16 high social anxiety students (30.7% of the current sample). Scores below the Heimberg et al. community SIAS mean identified 17 students with normative levels of social anxiety (the low social anxiety group; 32.7% of the current sample). This method has been found to be a conservative method to identify social anxiety disorder among college students (Rodebaugh, Woods, Heimberg, Liebowitz, & Schneier, 2006).

²Analyses were also conducted to examine the moderating effects of clinical social anxiety group membership on the relationship between perceived norm change on post-treatment drinking. Results using the clinical analogue revealed a similar pattern as that obtained using the continuous social anxiety measure. Results from these analyses are available from the first author upon request.

³Given the ordinal nature of the QFI, a multinomial logistic regression analysis was also performed to confirm that the social anxiety group X norms change was significantly related to post-BASICS typical drinking (covariates were retained), $\chi^2(26) = 56.54$, $p < .001$. Specifically, among students high in social anxiety, those with the lowest norms change were significantly more likely to drink heavily post-BASICS ($OR = 8.14$, 95% $CI = 5.13-11.16$, $p < .001$). This effect was not found among socially anxious students with higher norms changes ($OR = 1.68$, 95% $CI = -1.33-4.61$, $p = .37$), or among less anxious students with higher norms change ($OR = 4.14$, 95% $CI = -9.94-18.98$, $p = .53$) or lower norms change ($OR = 3.09$, 95% $CI = -0.24-6.43$, $p = .41$).

students. Participants with higher social anxiety reported greater normative beliefs and typical alcohol consumption at baseline and follow-up than did less socially anxious participants. Further, social anxiety was negatively correlated with change in normative beliefs. This finding is concerning as previous research (Carey et al., 2010; Neighbors, Lewis, et al., 2006) and the current data (Table 1) suggest treatment is most effective at decreasing alcohol use when misperceived norms are corrected (i.e., lowered) during treatment.

Change in normative beliefs moderated the relation between social anxiety and BASICS outcomes such that students with higher social anxiety and less change in normative beliefs reported the greatest drinking one month after completing BASICS. Thus, BASICS appears to be less effective at reducing typical alcohol use among students with higher social anxiety when their normative beliefs change less. When students experience a greater change in perceived norms, socially anxious students are not different from other students in their response to BASICS.

The current finding is noteworthy as high social anxiety students enter BASICS engaging in greater alcohol consumption (Table 1). Those with rigid cognitions about peer drinking behavior appear to continue to drink heavily on typical drinking occasions after receiving treatment. Given the amount of alcohol they reportedly typically consume following BASICS, high social anxiety students may continue to experience intoxication when they drink, facilitating physiological alcohol tolerance, a clinical criterion of alcohol dependence (APA, 2000; Weiss & Porrino, 2002). These data also indicate that it may be important to identify ways to increase the probability that high social anxiety students engage in cognitive restructuring (especially cognitive restructuring of normative beliefs) during BASICS.

Our findings also highlight the importance of developing alcohol interventions that are effective among students with elevated social anxiety, as young people with social anxiety disorder (SAD) are five times more likely to develop alcohol dependence than those without SAD (Buckner, Schmidt, Lang, Small, Schlauch et al., 2008). Further, 31% of the current sample endorsed clinically elevated social anxiety, which is on par with other samples in which approximately one-fourth of adults seeking alcohol treatment meet criteria for SAD (Thomas, Thevos, & Randall, 1999) and socially anxious clients report worse post-treatment outcomes (Terlecki et al., 2011). Future work could examine whether techniques can be incorporated into treatment that challenge not only normative beliefs, but also beliefs about others' approval of risky drinking given that such beliefs are related to greater alcohol-related problems among students with higher social anxiety (Buckner et al., 2011). Also, socially anxious students may benefit from learning skills to manage their negative affect in social situations without the use of alcohol given that they appear especially vulnerable to using alcohol to cope with negative affect broadly (Buckner et al., 2006; Stewart et al., 2006) and with negative affect in social situations specifically (Buckner & Heimberg, 2010; Thomas, Randall, & Carrigan, 2003).

In addition to the limitations described in Terlecki et al. (2010; 2011), limitations specific to the present investigation warrant discussion. First, to evaluate the synergistic impact of social anxiety and perceived norms on BASICS outcomes, the present sample was limited to those students who received the BASICS intervention, which reduced sample size. Second, the four week follow-up period was short. Although similar brief interventions using corrective normative feedback (not BASICS) have produced significant decreases in drinking quantity at a one month post-treatment (Carey, Carey, Maisto, & Henson, 2006) and reduced perceptions of normative peer drinking at 6-week post-treatment (Martens, Cimini, Barr, Rivero, Vellies et al., 2007), future work is necessary to determine the long-

term BASICS outcomes of socially anxious students. Third, the generalizability of the present findings to clinical SAD are limited because clinical assessments were not conducted to confirm the presence of SAD. Fourth, our primary outcome measure was a categorical variable (QFI) and future research could benefit from examination of continuous measures of drinking behaviors.. Fifth, the scope of this paper was limited to an evaluation of descriptive norms (perceptions of drinking behavior) rather than injunctive norms (the extent of approval/disapproval of drinking behavior). Given that injunctive norms also play an important role in drinking behaviors among socially anxious students (Buckner et al., 2011), future study designs may benefit from including both descriptive and injunctive norms when examining the relationship between social anxiety and alcohol consumption.

Despite these limitations, this study represents an important first step in the identification of standard components within a brief alcohol intervention that may be less effective among socially anxious students. Given that SAD is one of the most prevalent psychiatric conditions (Kessler, McGonagle, Zhao, Nelson, Hughes et al., 1994) and its onset precedes the development of alcohol use disorders (Buckner, Schmidt, et al., 2008; Buckner, Timpano, Zvolensky, Sachs-Ericsson, & Schmidt, 2008; Buckner & Turner, 2009; Schneier, Foose, Hasin, Heimberg, Liu et al., 2010), future research evaluating alcohol treatments merits the examination of social anxiety's effect on treatment outcomes. Further, given the high rates of social anxiety among students engaging in risky illicit substance use (e.g., Buckner, Bonn-Miller, Zvolensky, & Schmidt, 2007) an evaluation of corrective norms interventions for drug use also warrants evaluation among socially anxious students.

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Figure 1.

The interaction between baseline social anxiety group and follow-up perceived norms in the prediction of follow-up typical alcohol consumption during BASICS treatment.

** x is significantly different than y , $p < .01$.

Note. High and low social anxiety groups were determined using an empirically derived cut-off score (see footnote ¹; Heimberg et al., 1992).

Table 1

Bivariate correlations, means, and standard deviations of social anxiety, perceived norms, and typical drinks among university students randomized to BASICS (N = 52)

	1	2	3	4	5	6	7	M (SD)
1. Baseline social anxiety	–	.54**	.37**	.44**	–.37**	.32**	.34*	42.06 (22.66)
2. Baseline trait anxiety		–	.33*	.45**	–.10	.38**	.17	39.12 (8.56)
3. Baseline perceived norms			–	.39**	.56**	.06	.18	5.13 (1.03)
4. Follow-up perceived norms					–.55**	.23	.57**	3.94 (1.11)
5. Perceived norms change score						–.16	–.35**	1.19 (1.34)
6. Baseline typical drinks							.38**	4.44 (2.04)
7. Follow-up typical drinks							–	2.94 (1.30)

Note. BASICS = Brief Alcohol Screening and Intervention for College Students (Dimeff et al., 1999)

**
p < .01;

*
p < .05

Table 2
Summary of Hierarchical Regression Results and Individual Predictors of Follow-up Alcohol Use among BASICS Participants

Variable	ΔR^2	t	β	f^2	p
<i>Dependent variable: Follow-up typical drinks</i>					
Step 1: covariates	.21			0.32	0.02
Baseline typical drinks		2.61	.37		0.01
Referral group		-1.52	-0.21		0.14
Trait anxiety		0.15	0.02		0.88
Gender		0.81	.12		0.42
Step 2: main effects ($F_{change} = 6.55$)	.18			0.22	0.00
Baseline social anxiety		2.75	0.40		0.01
Perceived norm change		-1.97	-.24		0.05
Step 3: interaction effect ($F_{change} = 9.50$)	.11			0.12	0.00
Social anxiety X perceived norm change		-3.08	-0.47		0.00

Note. $N = 52$. β =standardized beta weight from multiple regression. BASICS = Brief Alcohol Screening and Intervention for College Students.