

PERCEIVED NORMS ABOUT COPING-MOTIVATED DRINKING MEDIATE THE
RELATIONS BETWEEN SOCIAL ANXIETY AND ALCOHOL USE AND RELATED
PROBLEMS

JESSICA NEWMAN

A THESIS SUBMITTED TO
THE FACULTY OF GRADUATE STUDIES
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF
MASTER OF ARTS

GRADUATE PROGRAM IN CLINICAL PSYCHOLOGY
YORK UNIVERSITY
TORONTO, ONTARIO

August 2024

© Jessica Newman, 2024

Abstract

Social anxiety has been shown to be a risk factor for alcohol-related problems among emerging adults. Perceived norms may be a relevant cognitive factor underlying this risk; however, previous literature has focused mostly on broad norms about alcohol use in general and not on norms about specific alcohol use behaviours. The main goal of this study was to examine the mediating role of perceived approval about *drinking to cope* specifically, in the pathway from social anxiety to alcohol use and related problems. I hypothesized that university students with heightened social anxiety would perceive their friends (in particular) as being approving of drinking to cope with negative affect, which would lead to an increase in alcohol problems. Participants were ages 18 to 29 from six Canadian universities and completed an online cross-sectional survey measuring social anxiety levels, perceived approval of specific risky drinking behaviours, alcohol use frequency, and alcohol-related problems. Mediation analyses showed that elevated social anxiety predicted greater perceptions of friends approving of drinking to cope, which in turn, predicted elevated alcohol-related problems. This mediation effect was not seen when analyzing perceived approval from typical students, highlighting a specificity for friends increasing perceived approval of coping-related drinking behaviours. Perceived approval of sexual risk taking from friends was associated with lower alcohol-related problems, and perceived approval of heavy drinking from typical students was associated with increased alcohol outcomes. This study is the first to examine the impact of perceived approval of specific risky drinking behaviours on alcohol outcomes among students with relatively elevated social anxiety. Such research could contribute to improving the efficacy of personalized normative feedback interventions for modifying normative perceptions and alcohol outcomes.

Keywords: social anxiety, perceived norms, alcohol use, alcohol-related problems

Acknowledgements

I would like to express my sincere gratitude to my supervisor, Dr. Matthew Keough, for providing his advice and expertise, as well as for his patience, invaluable guidance, and support over the course of my master's degree. I would also like to thank my defence committee member, Dr. Jeffrey Wardell, who generously provided his knowledge and feedback.

Additionally, I am grateful to SSHRC and OGS for the funding they provided. Lastly, I would like to recognize my family and friends for providing their love, encouragement, and emotional support throughout my studies.

Table of Contents

Abstract	ii
Acknowledgements	iii
List of Tables	v
List of Figures	vi
Perceived norms about coping-motivated drinking mediate the relations between social anxiety and alcohol use and related problems	1
Social Anxiety	2
Social Anxiety as a Risk for Heavy Drinking	3
Perceived Norms	5
Multifaceted Injunctive Norms	7
Current Study	9
Method	10
Participants and Procedure	10
Measures	11
Data Analyses	13
Results	15
Preliminary Analyses	15
Data Screening and Cleaning	15
Descriptive Statistics and Bivariate Correlations	16
Comparisons Between Reference Groups	18
Mediation Models	19
Friends as Reference Group	19
Typical Students as Reference Group	24
Discussion	30
Implications	33
Limitations and Future Research	35
References	38
Appendix	52

List of Tables

Table 1: Descriptive Statistics and Bivariate Correlations.....	17
---	----

List of Figures

Figure 1: Mediation Model 1: Social Anxiety to Alcohol Use Through Perceived Approval from Friends.....	21
Figure 2: Mediation Model 2: Social Anxiety to Alcohol-Related Problems Through Perceived Approval from Friends.....	23
Figure 3: Mediation Model 3: Social Anxiety to Alcohol Use Through Perceived Approval from Typical Students.....	26
Figure 4: Mediation Model 4: Social Anxiety to Alcohol-Related Problems Through Perceived Approval from Typical Students.....	28

Perceived norms about coping-motivated drinking mediate the relations between social anxiety and alcohol use and related problems

Emerging adulthood has been defined as the developmental time period from late teens to early twenties, and contemporary views indicate that emerging adulthood spans from 18 to 29 years of age (Arnett, 2000; Arnett et al., 2014). Involvement in risky behaviours, including alcohol use, peaks around this age (Arnett, 2000; Single et al., 2022). Compared to younger and older individuals, alcohol use is the heaviest among emerging adults, and the prevalence of alcohol use disorder (AUD) is greatest at this age as well (Andrews & Westling, 2014; Sher, 2014; Tanner, 2015). Research found that over the course of a month, 50.1% of emerging adults in the United States drank alcohol, 7.1% participated in heavy alcohol use, and 29.2% binge drank (Substance Abuse and Mental Health Services Administration, 2022). In addition, over the course of a year, 84% of emerging adults in Canada used alcohol and 40% experienced alcohol-related harms (Government of Canada, 2023). Among emerging adults, heavy drinking is associated with academic problems, psychological distress (Tembo et al., 2017), less social connection (Stein & Stein, 2008), physical or sexual assault (Krebs et al., 2009), and cognitive impairments, injury, overdose, or death (Hines et al., 2024; White & Hingson, 2013).

Over the years, the number of emerging adults attending university has increased (Andrews & Westling, 2014). Heavy drinking has become more normalized among university students (Edkins et al., 2017) and peer affiliation can influence alcohol use behaviour through socialization (Andrews & Westling, 2014; Borsari & Carey, 2001). Research suggests that not drinking during social gatherings in university is considered unusual and students may be teased for not drinking, leading to potential feelings of inferiority (Borsari & Carey, 2001; Rabow & Duncan-Schill, 1995). Compared to non-university students, emerging adults who attend

university tend to engage in heavier drinking; are at greater risk of related problems (Andrews & Westling, 2014; Dawson et al., 2005; Hallett et al., 2012; Hart & Burns, 2016; Johnston et al., 2010; Schulenberg et al., 2020); and are more likely to receive a diagnosis of an AUD (Slutske, 2005). With the majority of emerging adults attending postsecondary education (Government of Canada, 2021), there is a need to understand what individual difference factors and mechanisms relate to heavy drinking and related problems among emerging adults. Social anxiety may be one such factor.

Social Anxiety

Social anxiety disorder (SAD) is characterized by an excessive fear and worry about the possibility of being scrutinized or negatively evaluated by others in social situations (American Psychiatric Association, 2022; World Health Organization, 2022). Individuals with social anxiety worry about humiliating themselves in social situations (American Psychiatric Association, 2022; Stein & Stein, 2008). Rates of SAD have been found to be greatest among emerging adults (Schneier & Goldmark, 2015) and can cause high levels of functional impairment in various domains of life (Aderka et al., 2012), as well as decrease overall well-being (American Psychiatric Association, 2022). Concomitantly, social anxiety is common among university students and is one of the most significant and central psychological problems impacting this population (Luan et al., 2022; Pan et al., 2018). Approximately 10 to 20% of university students experience heightened levels of social anxiety (Adams et al., 2019; Hakami et al., 2018; Ratnani et al., 2017). Furthermore, social anxiety has been exacerbated and on the rise since the COVID-19 pandemic (Kindred & Bates, 2023). University contexts can be very difficult for students with social anxiety to navigate because of the increased social commitments and opportunities (Arjangga & Kusumaningsih, 2016; Campbell et al., 2016; Luan et al., 2022; Russell & Topham,

2012). Individuals with social anxiety may fear various social situations in university, such as having conversations with individuals they do not know, talking on the telephone, eating in public, public speaking, and attending large classes (American Psychiatric Association, 2022; Leigh & Clark, 2018). Students with social anxiety often fear these social situations and struggle with establishing social networks (Stein & Stein, 2008; Urani et al., 2003). In addition, social avoidance and distress, which is a common symptom of social anxiety, has been found to be associated with worse social adjustment (i.e., less engagement in social activities; Arjanggi & Kusumaningsih, 2016). A lack of participation in these aforementioned behaviours could interfere with socialization and academic achievement in university among students with social anxiety, especially since attending social events and having social relationships predicts continuation of schooling (Senter, 2024).

Social Anxiety as a Risk for Heavy Drinking

The Tension Reduction Theory (TRT) proposes that individuals with elevated levels of social anxiety use alcohol to experience its anxiolytic effects, such as reducing tension or anxiety (Conger, 1956; Cooper, 1994). Socially anxious students may also drink to reduce self-focus and inhibition, and increase social behaviour (Keough, Battista, et al., 2016; Schry & White, 2013). Therefore, university students with social anxiety may drink more alcohol to cope with their anxiety in social situations specifically, rather than drink more frequently in general (Linden et al., 2012). In addition, university students may perceive alcohol as a common and acceptable social lubricant among their peers (Buckner et al., 2011; Terlecki et al., 2012). Thus, it is not surprising that drinking alcohol is one of the primary ways that people with social anxiety cope with their worry and fear (Book & Randall, 2002). This type of drinking behaviour, which can be referred to as coping-related drinking (Hines et al., 2024), could help explain what leads to

alcohol-related problems among university students with social anxiety (Linden et al., 2012; Stewart et al., 2006). This theory can be explained by research showing that SAD and AUD are two of the most prevalent psychiatric disorders in emerging adulthood (Kessler et al., 2005; Schneier et al., 2010), and are frequently comorbid with each other (American Psychiatric Association, 2022; Buckner, Schmidt, et al., 2008; Buckner et al., 2011; Schneier & Goldmark, 2015). In fact, approximately 48% of individuals with SAD meet the criteria for AUD (Buckner, Ledley, et al., 2008; Grant et al., 2005). Subclinical levels of social anxiety are also a risk factor for AUD (Buckner et al., 2011; Buckner & Schmidt, 2009).

University students with social anxiety tend to be at particular risk of alcohol-related problems (Terlecki & Buckner, 2015). Although some research has found positive associations between social anxiety and measures of alcohol use (Ham et al., 2016; Neighbors, Fossos, et al., 2007), this relationship is inconsistent. However, research has found robust and consistent positive associations between social anxiety and alcohol-related problems among university students (Adams et al., 2019; Buckner, Schmidt, et al., 2008; Buckner et al., 2011; Ham et al., 2016; Keough, Badawi, et al., 2016; Linden et al., 2012; Neighbors, Fossos, et al., 2007; Schry & White, 2013). In addition, individuals high in social anxiety who are also higher in impulsivity tend to experience even more alcohol related problems (Adams et al., 2019; Keough, Badawi, et al., 2016). Such associations in the literature could be explained by the fact that the comorbidity between SAD and AUD leads to more functional impairment than SAD or AUD alone, since increased alcohol-related harms is more directly related to impairment compared to alcohol use (Buckner, Ledley, et al., 2008). Given the well-established positive association between social anxiety and alcohol-related harms among university students (Schry & White, 2013), there is a

need to examine the mediators that explain this relationship (Buckner et al., 2011). One such mediator could be perceived norms.

Perceived Norms

Alcohol use and related problems among university students have been found to be strongly predicted by perceived norms, also referred to as normative beliefs (Andrews & Westling, 2014; Borsari & Carey, 2001). Normative beliefs refer to the perceptions one has about drinking behaviours (Buckner et al., 2011), and can include descriptive and injunctive norms. Descriptive norms are beliefs about other people's quantity and frequency of alcohol use, and injunctive norms are beliefs about the extent to which other people approve of alcohol use (Andrews & Westling, 2014; Borsari & Carey, 2001). Conversely, actual norms refer to individual's actual drinking behaviours (Buckner et al., 2011). Normative perceptions can be viewed as cognitive factors that can be manipulated depending on the context and can operate in-the-moment to increase heavy drinking and related harms. Moreover, research has shown that perceived norms can be altered through corrective feedback and norming interventions about alcohol use (Hines et al., 2024; Mattern & Neighbors, 2004; Prince & Carey, 2010). Therefore, normative beliefs can be considered malleable cognitive factors that might explain the risk of alcohol-related harms among individuals with elevated levels of social anxiety. In addition, the Social Norms Theory helps explain how normative beliefs influence drinking behaviour and posits that our perceptions of other people's behaviours influence our own behaviour, even if those perceptions are inaccurate (Berkowitz, 2004). In fact, perceived drinking norms is one of the most consistent predictors of alcohol use (Borsari & Carey, 2001; Neighbors et al., 2007), and is a stronger predictor than actual drinking norms among university students (Berkowitz, 2004; Buckner et al., 2011; Dumas et al., 2019; Neighbors et al., 2006; Perkins et al., 2005).

A robust finding in the literature is that university students perceive others as drinking more (descriptive norm) and being more approving of (injunctive norm) risky alcohol use than is the case, and such overestimations are associated with greater personal alcohol use and related problems (Borsari & Carey, 2001; Dumas et al., 2019; Ecker, 2013; Lee et al., 2007; Neighbors et al., 2006, 2007, 2008; Perkins et al., 1999, 2005). In addition, the Social Comparison Theory (Festinger, 1954) and the Social Impact Theory (Latané, 1981) suggest that proximal peers (e.g., friends and parents) are more relevant and influential in one's own alcohol use than are distal peers (e.g., typical students; Lee et al., 2007). Research supports this, as findings indicate that among university students, perceived norms about friends more strongly relates to increased personal alcohol use and related problems than perceived norms about distal peers (Collins & Spelman, 2013; Lee et al., 2007; Neighbors et al., 2008; Yanovitzky et al., 2006).

Some studies have examined the role of perceived norms in the social anxiety pathway to alcohol use and related harms, but findings have been somewhat mixed. For example, a few studies have found that the association between perceived norms and drinking risk is stronger for young people who have high, relative to low, levels of social anxiety (Buckner et al., 2011; LaBrie et al., 2008; Neighbors, Fossos, et al., 2007). Building on this, Terlecki and colleagues (2012) reported that brief interventions to correct inaccurate drinking norms were less effective for students with elevated levels of social anxiety. Other studies found that higher descriptive norms led to a greater drinking quantity and alcohol-related problems only among those with lower social anxiety (Buckner et al., 2011). Interestingly, some research has found that social anxiety did not influence the association between perceived norms and drinking outcomes (Linden et al., 2012). These mixed findings could be explained by the variability in how injunctive norms have been measured (Hines et al., 2024). For example, some studies used

Baer's (1994) measure of injunctive norms analyzing perceived approval of drinking behaviours in various contexts (Ecker, 2013; LaBrie et al., 2010; Linden et al., 2012; Neighbors et al., 2008; Neighbors, Lee, et al., 2007; Osberg et al., 2021), while some studies created unique sets of items to measure injunctive norms (Collins & Spelman, 2013; LaBrie et al., 2008; Pearson & Hustad, 2014; Robinson et al., 2014; Willis et al., 2020). Notably, some previous research has found that certain measures of injunctive norms show poor internal consistency, implying that injunctive norms are not unitary (Hines et al., 2024; Neighbors et al., 2008; Osberg et al., 2021). However, injunctive norms have been measured using a single, general score in previous literature (Neighbors, Fossos, et al., 2007; Osberg et al., 2021). Drinking motivations and practices are varied, and therefore, perceptions of specific drinking practices might be associated with different normative beliefs. Therefore, we need to measure normative beliefs about drinking as multifaceted constructs.

Multifaceted Injunctive Norms

Previous research has suggested that injunctive norms are multifaceted given the varied nature of drinking habits among emerging adults (Hines et al., 2024). Therefore, it is crucial to examine the impact of more specific perceived norms as mediators in the relationship between social anxiety and alcohol use and related problems. The Perceived Approval of Risky Drinking Inventory (PARDI) is a novel, multifaceted measure of injunctive norms for several specific risky drinking practices among emerging adults across several reference groups (i.e., friends, typical students at one's university, and parents; Hines et al., 2024). Perceived norms about four specific risky drinking behaviours are captured in this scale: (1) heavy drinking, which measures perceived approval of activities related to heavy alcohol use [e.g., drinking games], (2) drinking-related problems, which measures perceived approval of experiencing problems from excessive

drinking [e.g., blackouts], (3) coping-related drinking, which measures perceived approval of coping with negative thoughts or feelings by drinking, and (4) sexual-risk taking, which measures perceived approval of participation in risky sexual behaviours while intoxicated (Hines et al., 2024). Previous research often combined items measuring perceived approval of heavy drinking and perceived approval of drinking-related problems into a single factor to measure injunctive norms (LaBrie et al., 2010; Neighbors, Lee, et al., 2007; Osberg et al., 2021, as cited in Hines et al., 2024). However, Hines et al. (2024) measured perceived approval of various risky drinking behaviours separately and found that perceived approval of heavy drinking and drinking-related problems, along with the factors of perceived approval of coping-related drinking and sexual-risk taking, are correlated but distinct. After controlling for overlap on the subscales of normative perceptions, all injunctive norms from the PARDI were differentially associated with alcohol use and related problems (Hines et al., 2024). Therefore, it is important to examine perceived norms about specific risky drinking behaviours separately, rather than perceived norms about general drinking behaviours, to better understand their unique associations with alcohol use and alcohol-related problems.

The current literature on social anxiety and drinking among emerging adults has focused on the impact of perceived norms about drinking in general but has not examined perceived norms about specific drinking behaviours. As mentioned, it is especially common for people with social anxiety to drink in order to cope with fear and worry (Book & Randall, 2002). Due to the nature of social anxiety, emerging adults who are socially anxious are likely to be more sensitive to perceived norms and therefore, be very influenced by their peers behaviour, especially if they view this behaviour as being normal (Neighbors et al., 2007). This implies that individuals with social anxiety may perceive drinking to cope when feeling distressed as more normative and

accepted than it actually is, potentially more so than individuals without social anxiety (Buckner et al., 2011; Terlecki et al., 2012). Considering that one of the strongest predictors of alcohol-related problems and disorders is drinking to cope (Carpenter & Hasin, 1999; Hines et al., 2024; Merrill et al., 2014), the coping-related drinking subscale from the PARDI is expected to be the most salient and relevant for our study.

Current Study

Overall, using the novel PARDI measure, the aim of this study was to examine perceived norms for specific risky drinking behaviours as mediators in the relationship between social anxiety and drinking outcomes. Specifically, I hypothesized that perceived approval of drinking to cope would mediate the association between social anxiety and personal alcohol outcomes. I also expected this mediational effect to be stronger for the friend reference group than for distal peers. The three other perceptions of approval of risky drinking behaviours from the PARDI (i.e., perceived approval of heavy drinking, drinking-related problems, and sexual-risk taking) from both friends and typical students were also explored as mediators.

Method

Participants and Procedure

The current study received Research Ethics Board (REB) approval from York University, Toronto Metropolitan University, University of British Columbia, University of Calgary, Carleton University, and Mount Saint Vincent University. Data from 2,564 participants ($M_{age} = 19.998$, $SD_{age} = 2.007$) were collected from the six universities. Data for the current study were taken from a large online questionnaire battery on February 26, 2024. The larger battery looked at various measures of substance use and behavioural addictions, addiction engagement, mental health symptoms, and other related correlates. Participants were recruited through the Sona Systems website that was associated with their university. Once participants signed up for the study, they were prompted to read and sign the online consent form. They then completed the online questionnaire battery which included the five measures mentioned below. Attention checks were embedded throughout the survey, and participants were asked if their data was honest and good quality. Upon completion of the questionnaire battery, participants were directed to read and sign a debriefing form with an explanation of the purpose and design of the battery and its use for research purposes. Participants were compensated with 1 credit (1%) towards the associated psychology course they were enrolled in for their participation. Eligible participants for the current study were university students between the ages of 18 and 29. Participants who did not report drinking alcohol in the past 12 months did not receive any of the follow up alcohol measures and were excluded from the analyses. Participants were also excluded from the analyses if they did not drink alcohol in the past 30 days, if they had data inconsistencies, or if they had missing data on the predictor or mediating variables. Out of a total of 2,564 eligible participants, 2,076 (81%) indicated that their biological sex assigned at birth was female and 488

(19%) indicated that their biological sex assigned at birth was male. Racial backgrounds were White (38.8%), East Asian (21.4%), South Asian (12.1%), Southeast Asian (7.7%), Middle Eastern (5.2%), Latin American (4%), Black (3%), Indigenous (1.6%) and Other (6.3%).

Measures

Demographic Information

Demographic information including age, biological sex assigned at birth, and racial backgrounds were assessed on the questionnaire battery.

Social Interaction Anxiety Scale (SIAS; Mattick & Clarke, 1998)

The SIAS measures individuals' level of fear of social interactions. It includes 20 items with a response scale of 0 (Not at all characteristic or true of me) to 4 (Extremely characteristic or true of me). Scores range from 0 to 80, with higher scores indicating greater levels of fear regarding social situations and alluding to greater levels of social anxiety. Sample items include “when mixing socially, I am uncomfortable”, and “I feel I’ll say something embarrassing when talking”. Previous literature has shown the SIAS to have excellent test-retest reliability and good to excellent internal consistency (Mattick & Clarke, 1998). In our specific sample, the internal consistency of the SIAS was excellent ($\omega = .94$).

Perceived Approval of Risky Drinking Inventory (PARDI; Hines et al., 2024)

The PARDI measures injunctive drinking norms from three reference groups: friends, typical students from one's university, and parents. However, we excluded parents as a reference group from the current study given that close friends and peers tend to be stronger influences on increased substance use behaviours than parents (Hines et al., 2024). In addition, parents were not included because it is unlikely that university students who are emerging adults are thinking about their parents as they are drinking, especially among students who move away for

university. Therefore, we assumed it was unlikely that perceptions of parent's approval of risky drinking behaviours would have a strong influence on increasing university student's alcohol use and related problems.

The PARDI measure includes 20 items that tap into various perceptions of approval of risky drinking behaviours with a response scale of 1 (Strongly Disapprove) to 7 (Strongly Approve). The four subscales of perceptions of approval of risky drinking behaviours in the PARDI scale are heavy drinking (robust consumption of alcohol) consisting of 5 items, drinking-related problems (drinking associated with the experience of problems) consisting of 5 items, coping-related drinking (coping with negative thoughts or feelings by drinking) consisting of 7 items, and sexual risk taking (participating in risky sexual behaviours while intoxicated) consisting of 3 items. Participants indicated the extent to which they believed each reference group (i.e., friends and typical students) approved of various behaviours. Sample items include perceived approval of the following: "you drinking a large amount of alcohol quickly (e.g., chugging instead of sipping, drinking shots, binge drinking)" from the heavy drinking subscale, "you passing out as a result of drinking (i.e., drinking so much that you lose consciousness)" from the drinking-related problems subscale, "you drinking to reduce your anxiety" from the coping-related drinking subscale, and "you having sex with someone while intoxicated that you would not have if you were sober" from the sexual risk taking subscale (see Appendix; Hines et al., 2024). Scores range from 20 to 140, with higher scores indicating greater injunctive norms about drinking behaviours. Previous literature has shown that the internal consistency of the PARDI subscales were good to excellent (Hines et al., 2024). In our specific sample, the internal consistencies for the PARDI subscales for each reference group were good to excellent ($\omega = .812-.925$).

Frequency of Alcohol Use (Collins & Spelman, 2013)

Participants were asked about their alcohol use frequency. They were asked how many days they consumed alcohol on in the past 30 days.

Screeners for Substance and Behavioral Addictions (SSBA; Schluter et al., 2018)

The SSBA measures risk indicators of addiction, alcohol-related harms, as well as involvement in problematic behaviours related to addiction across one's use of four substances and engagement in six behaviours (Schluter et al., 2018). For the current study, alcohol was the only substance examined. The SSBA consists of 4 items querying about one's alcohol use in the past 12 months. Participants responded to the following statements about their alcohol use: (1) "I did it too much", (2) "Once I started, I couldn't stop", (3) "I felt I had to do it in order to function", and (4) "I continued to do it, even though it caused problems". Response options ranged from "None of the time" to "All of the time", with the option to select "Don't know/Prefer not to say". Previous literature has shown that the SSBA has acceptable to good convergent validity and good to excellent internal consistency (Hodgins et al., 2023; Schluter et al., 2018). In our specific sample, the internal consistency of the SSBA was good ($\omega = .81$).

Data Analyses

Descriptive statistics and correlations were run for all variables. Paired samples t-tests were run to analyze within-group differences in perceptions of approval for each risky drinking behaviour between the two reference groups of friends and typical students. Mediation analyses were run using PROCESS macro for SPSS. Four mediation models were run to analyze multiple perceived norms from the PARDI measure as correlated mediators in the relations between social anxiety and both alcohol use and alcohol-related problems. These models were grouped thematically by reference group: a) perceived approval from friends or b) perceived approval

from typical students. Outcomes were either alcohol use frequency or alcohol-related problems. Bias corrected bootstrapped confidence intervals (bootstrap resamples = 5,000) were used to evaluate the presence and magnitude of mediational effects. We used 95% confidence intervals, and a mediation effect was said to be present if the confidence interval did not include zero (Fritz & MacKinnon, 2007). We also reported standardized effects in order for the reader to interpret the magnitude differences.

Results

Preliminary Analyses

Data Screening and Cleaning

A total of 67 submissions were deleted from the dataset due to data inconsistencies (e.g., duplicates), resulting in a sample size of 5,440. Participants were then excluded from the dataset if they failed the attention check or responded that they did not provide honest data ($N = 1,199$), if they were below the age of 18 or above the age of 29 ($N = 183$), and if they did not drink alcohol in the past 12 months ($N = 1,256$), with some participants overlapping on all of these exclusion criteria. One participant was excluded because of data quality issues in which their responses included values that were not possible. This resulted in 2,971 participants. Participants were then excluded if they had missing data on or reported that they did not drink alcohol in the past 30 days ($N = 388$), if they had missing data on the predictor variable ($N = 5$), or if they had missing data on any of the mediating variables ($N = 14$). This resulted in 2,564 eligible participants.

Outliers above the cut-off of 3.29 standard deviations were detected among the variables of perceived approval of heavy drinking from typical students, perceived approval of drinking-related problems from friends and typical students, and perceived approval of sexual risk taking from friends and typical students measured by the PARDI, among the variable of alcohol use frequency, and among the variable of alcohol-related problems measured by the SSBA. Such extreme scores were winsorized based on Tabachnick and Fidell (2013) in order to reduce their influence on the dataset and results. No outliers were found among the variable of social anxiety measured by the SIAS or among the variables of perceived approval of heavy drinking from friends or perceived approval of coping-related drinking from friends and typical students

measured by the PARDI. Data screening revealed that all of the variables examined for the current study were normally distributed (see Table 1; skew < 3.0; kurtosis < 8; Kline, 2005).

Descriptive Statistics and Bivariate Correlations

Descriptive statistics and bivariate correlations are presented in Table 1 and demonstrated significant positive associations between each of the four PARDI scales from both friends and typical students (all r -values $\geq .053$, p -values $\leq .01$). There were no concerns of multicollinearity in the PARDI scale as the strength of the intercorrelations between the four PARDI subscales were not exceedingly high for the reference group of friends ($r = .255-.485$) or for the reference group of typical students ($r = .232-.419$). Correlations demonstrated that social anxiety was significantly positively correlated with alcohol-related problems but was not significantly correlated with alcohol use frequency (see Table 1).

Table 1*Descriptive Statistics and Bivariate Correlations*

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Social anxiety	1.00	-.003	.047*	-.009	.043*	.146**	.157**	-.101**	-.036	-.029	.103**
2. HD from friends		1.00	.615**	.485**	.187**	.364**	.084**	.255**	.106**	.227**	.219**
3. HD from typical students			1.00	.230**	.419**	.168**	.344**	.053**	.232**	.092**	.058**
4. DRP from friends				1.00	.572**	.436**	.189**	.519**	.347**	.178**	.200**
5. DRP from typical students					1.00	.258**	.489**	.220**	.572**	.012	.012
6. CRD from friends						1.00	.670**	.269**	.192**	.111**	.243**
7. CRD from typical students							1.00	.069**	.372**	-.041*	.046*
8. SRT from friends								1.00	.575**	.130**	.150**
9. SRT from typical students									1.00	.009	.020
10. Alcohol use frequency										1.00	.423**
11. Alcohol-related problems											1.00
<i>M</i>	34.721	4.900	4.929	2.375	2.818	3.040	3.497	1.716	2.215	4.480	2.199
<i>SD</i>	16.089	1.325	1.096	1.030	1.064	1.303	1.264	0.980	1.099	3.766	2.669
<i>Skew</i>	.226	-.556	-.286	.590	.141	.364	-.024	1.485	.665	1.702	1.583
<i>Kurtosis</i>	-.665	-.016	.127	-.108	-.470	-.472	-.296	1.459	-.417	2.786	2.090
<i>Range</i>	79.00	6.00	5.69	4.79	5.31	6.00	6.00	4.03	4.85	19.94	11.33

Note. HD = perceived approval of heavy drinking; DRP = perceived approval of drinking-related problems; CRD = perceived approval of coping-related

drinking; SRT = perceived approval of sexual risk taking; Alcohol use frequency = number of days alcohol was consumed in the past 30 days; Alcohol-related problems = alcohol-related problems measured by the SSBA.

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

Correlations demonstrated that social anxiety was significantly positively correlated with injunctive norms about both heavy drinking and drinking-related problems from typical students. This is consistent with some research showing that university students, including those with higher social anxiety, may perceive objectively negative alcohol-related problems as neutral or even positive, leading to more alcohol-related problems (Mallett et al., 2008; Nitka & O'Connor, 2017). However, social anxiety was more strongly positively correlated to injunctive norms about coping-related drinking for both friends and typical students. In addition, social anxiety was strongly negatively correlated to injunctive norms about sexual risk-taking from friends. Personal alcohol use and alcohol-related problems were significantly positively associated with injunctive norms about heavy drinking from friends and typical students, injunctive norms about drinking-related problems from friends but not typical students, injunctive norms about coping-related drinking from friends, and injunctive norms about sexual risk-taking from friends but not from typical students. Interestingly, injunctive norms about coping-related drinking from typical students was positively correlated to personal alcohol-related problems and negatively correlated to personal alcohol use (see Table 1).

Comparisons Between Reference Groups

A paired samples t-test was conducted to examine the differences between perceptions of approval from friends and perceptions of approval from typical students on all four risky drinking behaviours. Perceived approval from friends about heavy drinking ($M = 4.901$, $SD = 1.325$) was not significantly different from perceived approval from typical students about heavy drinking ($M = 4.929$, $SD = 1.096$; $t(2563) = -1.350$, $p = .177$, $d = -.027$). Perceived approval from friends about problem-related drinking ($M = 2.375$, $SD = 1.030$) was significantly different from perceived approval from typical students about problem-related drinking ($M = 2.818$, $SD =$

1.064; $t(2563) = -23.123, p < .001, d = -.457$). Perceived approval from friends about coping-related drinking ($M = 3.040, SD = 1.303$) was significantly different from perceived approval from typical students about coping-related drinking ($M = 3.497, SD = 1.264; t(2563) = -22.193, p < .001, d = -.438$). Perceived approval from friends about sexual risk taking ($M = 1.716, SD = .980$) was significantly different from perceived approval from typical students about sexual risk taking ($M = 2.215, SD = 1.099; t(2563) = -26.252, p < .001, d = -.518$). Among the differences that were significant, the means for perceived approval from typical students were higher than the means for perceived approval from friends.

Mediation Models

Friends as Reference Group

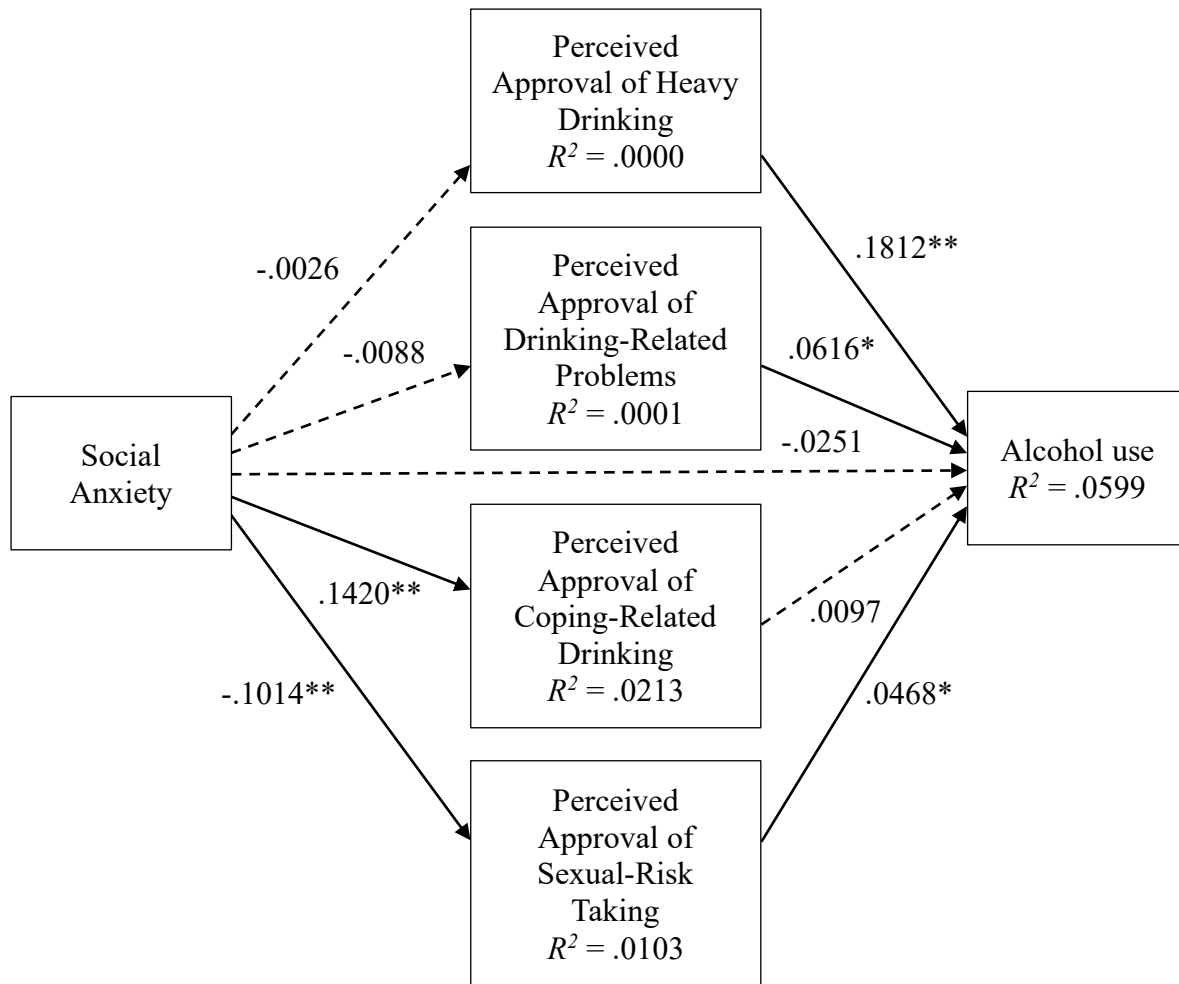
Alcohol Use Model. The first model looked at the reference group of friends and the outcome variable of alcohol use frequency. Social anxiety did not predict injunctive norms about heavy drinking ($B = -.0002, SE = .0016, \beta = -.0026, p = .8955$) or drinking-related problems from friends ($B = -.0006, SE = .0013, \beta = -.0088, p = .6546$). Social anxiety positively predicted injunctive norms about coping-related drinking from friends ($B = .0118, SE = .0016, \beta = .1460, p < .001$), meaning that the higher student's social anxiety was, the more likely they were to perceive their friends as being approving of drinking to cope with negative affect. In addition, social anxiety negatively predicted injunctive norms about sexual risk taking from friends ($B = -.0062, SE = .0012, \beta = -.1014, p < .001$), meaning that the higher student's social anxiety was, the less likely they were to perceive their friends as being approving of sexual risk taking while intoxicated. Notably, while social anxiety predicted the most variance in perceived approval about coping-related drinking from friends, it accounted for a very small proportion of variance overall across all four injunctive norms (see Figure 1). Personal alcohol use was positively

predicted by injunctive norms about heavy drinking ($B = .5150$, $SE = .0635$, $\beta = .1812$, $p < .001$, 95% CI [.3905, .6396]), drinking-related problems ($B = .2253$, $SE = .0940$, $\beta = .0616$, $p = .0166$, 95% CI [.0410, .4096]), and sexual risk taking from friends ($B = .1798$, $SE = .0870$, $\beta = .0468$, $p = .0389$, 95% CI [.0092, .3505]). Personal alcohol use was not significantly predicted by injunctive norms about coping-related drinking from friends ($B = .0279$, $SE = .0639$, $\beta = .0097$, $p = .6617$, 95% CI [-.0973, .1531]). When controlling for the mediators, personal alcohol use was not predicted by social anxiety ($B = -.0059$, $SE = .0046$, $\beta = -.0251$, $p = .2009$, 95% CI [-.0149, .0031]). Overall, social anxiety and all four injunctive norms from the reference group of friends explained approximately 5.99% of the variance in personal alcohol use (see Figure 1).

Mediation analyses showed that perceptions approval of heavy drinking ($B = -.0001$, $\beta = -.0005$, 95% CI [-.0076, .0066]), drinking-related problems ($B = -.0001$, $\beta = -.0005$, 95% CI [-.0036, .0022]), coping-related drinking ($B = .0003$, $\beta = .0014$, 95% CI [-.0050, .0083]), and sexual risk taking ($B = -.0011$, $\beta = -.0047$, 95% CI [-.0103, .0001]) from friends did not significantly mediate the relationship between social anxiety and personal alcohol use.

Figure 1

Mediation Model 1: Social Anxiety to Alcohol Use Through Perceived Approval from Friends



Note. The figure shows standardized coefficients. The solid lines indicate significant effects, and the dashed lines indicate non-significant effects.

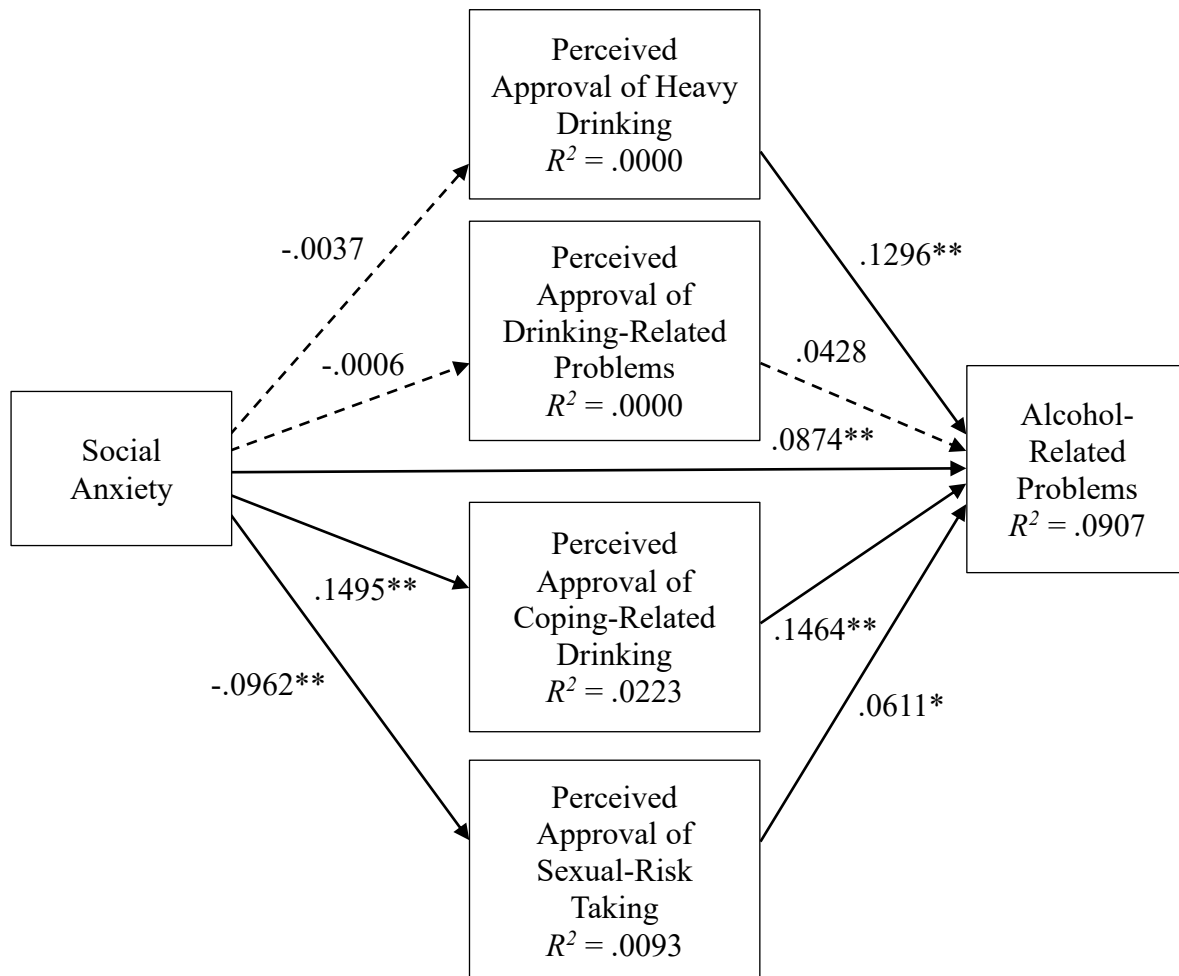
* $p < .05$. ** $p < .01$.

Alcohol-Related Problems Model. The second model looked at the reference group of friends and the outcome variable of alcohol-related problems. As seen in the previous model, social anxiety did not predict injunctive norms about heavy drinking ($B = -.0003$, $SE = .0017$, β

= -.0037, $p = .8565$) or drinking-related problems from friends ($B = .0000$, $SE = .0013$, $\beta = -.0006$, $p = .9754$). Like in the previous model, social anxiety positively predicted injunctive norms about coping-related drinking ($B = .0120$, $SE = .0016$, $\beta = .1495$, $p < .001$), and negatively predicted injunctive norms about sexual-risk taking from friends ($B = -.0059$, $SE = .0012$, $\beta = -.0962$, $p < .001$). Similar to the previous model, the current model showed that social anxiety predicted the most variance in perceived approval about coping-related drinking from friends; however, it accounted for a very small proportion of variance overall across all four injunctive norms (see Figure 2). Personal alcohol-related problems were positively predicted by injunctive norms about heavy drinking ($B = .2638$, $SE = .0460$, $\beta = .1296$, $p < .001$, 95% CI [.1735, .3541]), coping-motivating drinking ($B = .3009$, $SE = .0462$, $\beta = .1464$, $p < .001$, 95% CI [.2103, .3915]), and sexual risk-taking from friends ($B = .1662$, $SE = .0623$, $\beta = .0611$, $p = .0077$, 95% CI [.0441, .2884]). Personal alcohol-related problems were not significantly predicted by injunctive norms about drinking-related problems from friends ($B = .1111$, $SE = .0669$, $\beta = .0428$, $p = .0972$, 95% CI [-.0202, .2424]). When controlling for the mediators, personal alcohol-related problems was positively predicted by social anxiety ($B = .0145$, $SE = .0033$, $\beta = .0874$, $p < .001$, 95% CI [.0080, .0209]). Overall, social anxiety and all four injunctive norms from the reference group of friends explained approximately 9.07% of the variance in personal alcohol-related problems (see Figure 2).

Figure 2

Mediation Model 2: Social Anxiety to Alcohol-Related Problems Through Perceived Approval from Friends



Note. The figure shows standardized coefficients. The solid lines indicate significant effects, and the dashed lines indicate non-significant effects. We are missing data for the outcome variable of alcohol-related problems. Therefore, the final sample size for this model is 2,412.

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

Mediation analyses showed indirect effects from social anxiety to perceptions of friend's approval of coping-related drinking to personal alcohol-related problems ($B = .0036, \beta = .0219, 95\% \text{ CI } [.0135, .0317]$) and from social anxiety to perceptions of friend's approval of sexual-risk taking to personal alcohol-related problems ($B = -.0010, \beta = -.0059, 95\% \text{ CI } [-.0117, -.0010]$). In other words, higher social anxiety led to greater personal alcohol-related problems through greater injunctive norms about coping-motivated drinking from friends. In addition, higher social anxiety led to less personal alcohol-related problems through lower injunctive norms about sexual risk taking from friends. Injunctive norms about heavy drinking ($B = -.0001, \beta = -.0005, 95\% \text{ CI } [-.0058, .0049]$) and drinking-related problems from friends ($B = .0000, \beta = .0000, 95\% \text{ CI } [-.0022, .0023]$) did not significantly mediate the relationship between social anxiety and personal alcohol-related problems.

Typical Students as Reference Group

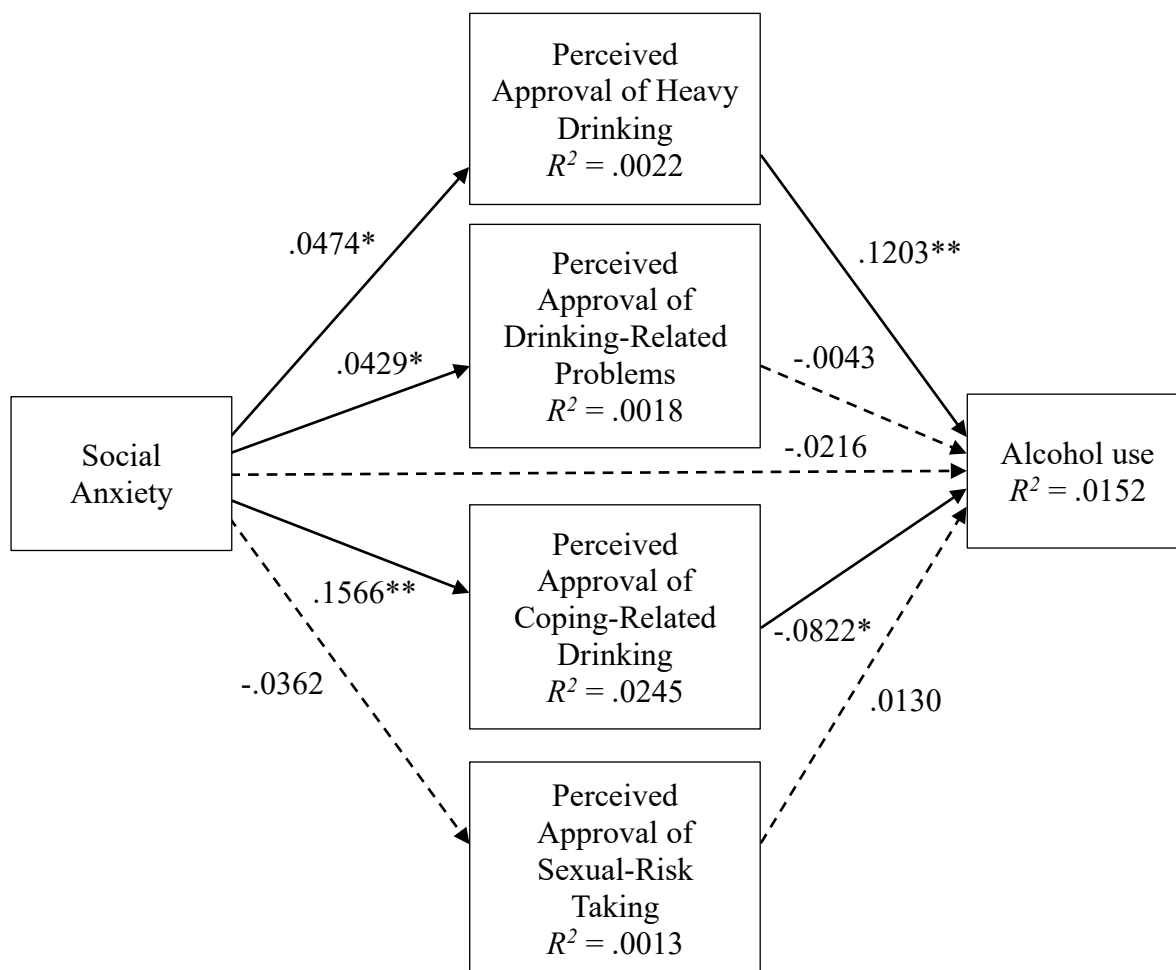
Alcohol Use Model. The third model looked at the reference group of typical students and the outcome variable of alcohol use frequency. Social anxiety positively predicted injunctive norms about heavy drinking ($B = .0032, SE = .0013, \beta = .0474, p = .0163$), drinking-related problems ($B = .0028, SE = .0013, \beta = .0429, p = .0299$), and coping-motivating drinking from typical students ($B = .0123, SE = .0015, \beta = .1566, p < .001$). Social anxiety did not predict injunctive norms about sexual risk taking from typical students ($B = -.0025, SE = .0013, \beta = -.0362, p = .0667$). Notably, while social anxiety predicted the most variance in perceived approval about coping-related drinking from typical students, it accounted for a very small proportion of variance overall across all four injunctive norms (see Figure 3). Personal alcohol use was positively predicted by injunctive norms about heavy drinking from typical students ($B = .4135, SE = .0755, \beta = .1203, p < .001, 95\% \text{ CI } [.2655, .5615]$), and was negatively predicted

by injunctive norms about coping-related drinking from typical students ($B = -.2449$, $SE = .0697$, $\beta = -.0822$, $p = .0004$ 95% CI $[-.3815, -.1083]$). Personal alcohol use was not significantly predicted by injunctive norms about drinking-related problems ($B = -.0153$, $SE = .0948$, $\beta = -.0043$, $p = .8720$, 95% CI $[-.2013, .1707]$ or sexual-risk taking from typical students ($B = .0444$, $SE = .0831$, $\beta = .0130$, $p = .5930$, 95% CI $[-.1185, .2074]$). When controlling for the mediators, personal alcohol use was not significantly predicted by social anxiety ($B = -.0051$, $SE = .0047$, $\beta = -.0216$, $p = .2796$, 95% CI $[-.0142, .0041]$). Overall, social anxiety and all four injunctive norms from the reference group of typical students explained approximately 1.52% of the variance in personal alcohol use (see Figure 3).

Mediation analyses showed indirect effects from social anxiety to perceptions of typical student's approval of heavy drinking to personal alcohol use ($B = .0013$, $\beta = .0057$, 95% CI $[.0010, .0112]$) and from social anxiety to perceptions of typical student's approval of coping-related drinking to personal alcohol use from typical students ($B = -.0030$, $\beta = -.0129$, 95% CI $[-.0209, -.0052]$). In other words, higher social anxiety led to a greater personal alcohol use frequency through greater injunctive norms about heavy drinking from typical students. In addition, higher social anxiety led to lower personal alcohol use frequency through greater injunctive norms about coping-related drinking from typical students. Injunctive norms about drinking-related problems ($B = .0000$, $\beta = -.0002$, 95% CI $[-.0028, .0025]$) and sexual risk-taking from typical students ($B = -.0001$, $\beta = -.0005$, 95% CI $[-.0026, .0013]$) did not significantly mediate the relationship between social anxiety and personal alcohol use.

Figure 3

Mediation Model 3: Social Anxiety to Alcohol Use Through Perceived Approval from Typical Students



Note. The figure shows standardized coefficients. The solid lines indicate significant effects, and the dashed lines indicate non-significant effects.

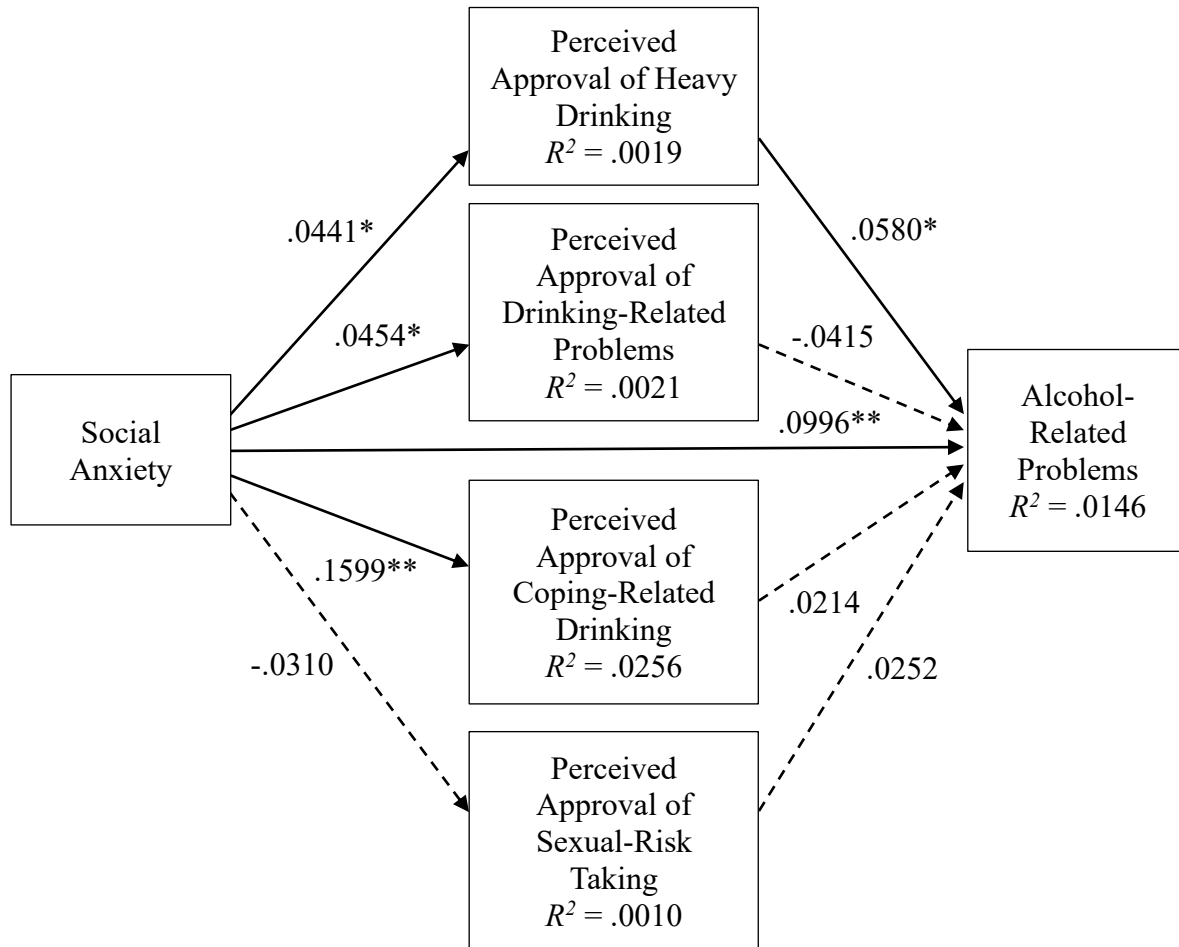
$*p < .05$. $**p < .01$.

Alcohol-Related Problems Model. The fourth model looked at the reference group of typical students and the outcome variable of alcohol-related problems. Social anxiety positively

predicted injunctive norms about heavy drinking ($B = .0030$, $SE = .0014$, $\beta = .0441$, $p = .0303$), drinking-related problems ($B = .0030$, $SE = .0013$, $\beta = .0454$, $p = .0259$), and coping-motivating drinking from typical students ($B = .0125$, $SE = .0016$, $\beta = .1599$, $p < .001$). Social anxiety did not predict injunctive norms about sexual risk taking from typical students ($B = -.0021$, $SE = .0014$, $\beta = -.0310$, $p = .1284$). Similar to all previous models, the current model showed that social anxiety predicted the most variance in perceived approval about coping-related drinking from typical students; however, it accounted for a very small proportion of variance overall across all four injunctive norms (see Figure 4). Personal alcohol-related problems were positively predicted by injunctive norms about heavy drinking from typical students ($B = .1419$, $SE = .0554$, $\beta = .0580$, $p = .0105$, 95% CI [.0332, .2506]). Personal alcohol-related problems were not significantly predicted by injunctive norms about drinking-related problems ($B = -.1042$, $SE = .0694$, $\beta = -.0415$, $p = .1334$, 95% CI [-.2403, .0319]), coping-related drinking ($B = .0455$, $SE = .0512$, $\beta = .0214$, $p = .3747$, 95% CI [-.0550, .1460]), or sexual-risk taking from typical students ($B = .0613$, $SE = .0609$, $\beta = .0252$, $p = .3147$, 95% CI [-.0582, .1807]). When controlling for the mediators, personal alcohol-related problems was positively predicted by social anxiety ($B = .0165$, $SE = .0034$, $\beta = .0996$, $p < .001$, 95% CI [.0098, .0232]). Overall, social anxiety and all four injunctive norms from the reference group of typical students explained approximately 1.46% of the variance in personal alcohol-related problems (see Figure 4).

Figure 4

Mediation Model 4: Social Anxiety to Alcohol-Related Problems Through Perceived Approval from Typical Students



Note. The figure shows standardized coefficients. The solid lines indicate significant effects, and the dashed lines indicate non-significant effects. We are missing data for the outcome variable of alcohol-related problems. Therefore, the final sample size for this model is 2,412.

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

Mediation analyses showed that perceptions of typical students' approval of heavy drinking significantly mediated the relationship between social anxiety and personal alcohol-related problems ($B = .0004, \beta = .0026, 95\% \text{ CI } [.0001, .0062]$). In other words, higher social anxiety led to greater personal alcohol-related problems through greater injunctive norms about heavy drinking from typical students. Injunctive norms about drinking-related problems ($B = -.0003, \beta = -.0019, 95\% \text{ CI } [-.0060, .0007]$), coping-related drinking ($B = .0006, \beta = .0034, 95\% \text{ CI } [-.0043, .0114]$), and sexual risk-taking from typical students ($B = -.0001, \beta = -.0008, 95\% \text{ CI } [-.0032, .0010]$) did not significantly mediate the relationship between social anxiety and personal alcohol-related problems.

Discussion

Our goal was to examine the relations between social anxiety and both alcohol use and alcohol-related problems through various mediators of injunctive norms about specific risky drinking behaviours. Supporting our hypothesis, we found that injunctive norms about coping-related drinking from friends mediated the relationship between social anxiety and alcohol-related problems. Specifically, individuals with higher levels of social anxiety perceived their friends as approving of drinking to cope with negative affect, which led to more personal alcohol-related problems. In addition, students with higher levels of social anxiety perceived their friends as being less approving of engaging in sexual risk taking behaviours while intoxicated, which ultimately led to less personal alcohol-related problems. Neither perceived approval of coping-related drinking nor sexual risk taking from friends significantly mediated the relationship between social anxiety and alcohol use. In addition, neither perceived approval of heavy drinking nor drinking-related problems from friends significantly mediated the relationship between social anxiety and alcohol use or alcohol-related problems. Findings from the current study also showed that individuals with higher levels of social anxiety tended to perceive typical students as approving of drinking to cope with negative affect, which subsequently decreased personal alcohol use. This mediation effect was not supported for the outcome of alcohol-related problems. The current study also found that perceived approval about heavy drinking from typical students significantly mediated the relationship between social anxiety and both personal alcohol use and alcohol-related problems. Specifically, individuals with higher levels of social anxiety tended to perceive typical students as approving of heavy drinking, which led to more personal alcohol use and alcohol-related problems. Neither

perceived approval of drinking-related problems nor sexual risk taking from typical students mediated the relationship between social anxiety and alcohol use or alcohol-related problems.

Our findings are in line with what would be expected based on the Social Comparison Theory (Festinger, 1954) and the Social Impact Theory (Latané, 1981): Our findings indicated that perceptions of proximal peers were more relevant and influential in one's own alcohol-related problems through perceived approval about coping-related drinking than perceptions of distal peers (Lee et al., 2007). While perceived approval of coping-related drinking in particular, specifically from one's friends, predicted increased personal alcohol-related problems among students who have heightened social anxiety, perceiving typical students as approving of coping-related drinking actually decreased one's alcohol use. Therefore, even though drinking to cope is perceived as being normative and approved by typical students, individuals with social anxiety might not actually drink to cope around typical students or strangers. This may be because individuals with social anxiety worry they will (1) act in ways that will embarrass themselves in front of others, and/or (2) reveal their anxiety-related symptoms, such as sweating, trembling, blushing, or appearing incompetent to others. These individuals may believe that these behaviours will be negatively evaluated by other people (Leigh & Clark, 2018; Stein & Stein, 2008). As a result, they become very self-focused and closely monitor their behaviours in social situations, including their drinking behaviours, since drinking could lead to embarrassment or anxiety-related symptoms, and they do not want others to know they are feeling anxious or know that they are drinking for the purpose of coping with negative affect (Khakpoor et al., 2019; Leigh & Clark, 2018). However, individuals with heightened social anxiety may be more likely to drink to cope when they are with their friends because they may perceive their friends as being less judgemental of their reason for drinking and of their anxiety-related symptoms.

We also saw some evidence of greater misperceptions of approval of risky drinking behaviours from typical students than from friends, albeit we did not see this difference for perceived approval of heavy drinking. This may be because one may know more about their friend's drinking behaviour than typical students drinking behaviour, leading to less misperceptions about their friends. Specifically, individuals with social anxiety may observe their friends as engaging in coping-related drinking more often than they observe typical students engaging in this drinking behaviour. Relatedly, friends may be more open about their reason for drinking compared to typical students. Therefore, one might observe a typical student drinking heavily but not know their reasoning for such heavy drinking. Not knowing the reason for distal peers drinking behaviours could explain why perceived norms about proximal peers have been found as having a greater influence on alcohol use and related problems than perceived norms about distal peers (Collins & Spelman, 2013; Lee et al., 2007; Neighbors et al., 2008; Yanovitzky et al., 2006). Furthermore, individuals are likely still influenced by perceived approval from their friends, especially among individuals with heightened social anxiety, because individuals with social anxiety may spend more time with each other, have a smaller group of friends that they engage in drinking behaviours with, and have common motives for alcohol use.

We also found that when controlling for mediators, social anxiety positively predicted alcohol-related problems and did not significantly predict alcohol use frequency. This is consistent with previous literature showing more consistent, positive associations between social anxiety and alcohol-related problems, while the findings on the association between social anxiety and alcohol use tend to be less consistent (Schry & White, 2013). These findings suggest that the associations between social anxiety and drinking outcomes are complicated; that is, individuals with social anxiety do not appear to be engaging in heightened alcohol use frequency,

but they are experiencing more risk for alcohol-related problems and harms. Literature shows that drinking to cope in general leads to alcohol-related problems, irrespective of level of alcohol use (Linden et al., 2012; Stewart et al., 2006). Notably, it may be that individuals with social anxiety experience small issues related to drinking, which may be magnified by their anxiety. Findings from the current study help to clarify these complicated associations. In addition, the direct effects from the current study suggest that there are other possible mediators that are relevant in the association between social anxiety and drinking outcomes. Such mediators could be one's personal motives for alcohol use, such as one's motivation to drink alcohol to cope with negative affect (Keough, Badawi, et al., 2016). Notably, coping and conformity motives have been found to be related to (Stewart et al., 2006; Stewart & Zeitlin, 1995) and predictive of alcohol-related problems among individuals with social anxiety (Keough, Badawi, et al., 2016). Overall, findings from the current study imply that the context and the reference group really matter: Individuals with social anxiety have different normative perceptions about their friends and typical students, with such perceptions influencing drinking behaviours.

Implications

Findings from the current study are consistent with relevant theories: They are consistent with the TRT by showing that emerging adults in university use alcohol to mitigate social anxiety symptoms and to cope with negative affect. They are also consistent with the Social Norms Theory since our results indicated that normative beliefs, including perceptions of other people's approval of various drinking behaviours, influence one's own drinking behaviour (Berkowitz, 2004).

Findings also support the utility of examining various distinct and specific factors of injunctive norms about drinking in order to better understand what may influence alcohol use

and related problems. Hines et al. (2024) stated that using a psychometrically sound measure like the PARDI was expected to allow for more nuanced examinations of specific injunctive norms among various populations. They also found that all four subscales on the PARDI uniquely predicted alcohol use and related problems (Hines et al., 2024). The current study supported Hines et al.'s (2024) claim since we found that injunctive norms about various risky drinking behaviours on the PARDI differentially predicted alcohol use and alcohol-related problems among university students with social anxiety. Overall, the current study elucidated the utility of using the PARDI for the specific sample of university students with social anxiety. The use of this validated scale helped us pinpoint the specific normative perceptions that are most relevant for social anxiety and drinking.

In addition, our findings could have important clinical implications. Specifically, the current research could contribute to improving personalized feedback interventions (PFI). PFIs, which includes personalized normative feedback (PNF), aim to change individuals perceived drinking norms (Mattern & Neighbors, 2004) by correcting one's misperceptions of drinking norms. PFIs have been found to reduce misperceptions of drinking norms, which can decrease the quantity and frequency of alcohol use and symptom severity among university students who drink heavily (Mattern & Neighbors, 2004; Neighbors et al., 2004; Prince & Carey, 2010; Saxton et al., 2021). This makes sense considering that perceived norms have been identified as factors that can be altered with corrective feedback (Hines et al., 2024; Mattern & Neighbors, 2004; Prince & Carey, 2010). Notably, the current study found that coping-related drinking norms were highly relevant for individuals for social anxiety. In addition, PFIs have been suggested as being even more effective for individuals whose drinking is largely motivated by social reasons (Neighbors et al., 2004). Such drinking is likely common among individuals with social anxiety

since they may drink more to ‘fit in’ (p. 92), which could increase their risk of alcohol use and related problems (Neighbors, Fossos, et al., 2007). This elucidates the need to target perceived norms about specific drinking habits in PFIs. Results from the current study show that university students may have different normative perceptions about various drinking behaviours, and students are likely overestimating many of these drinking behaviours. Therefore, orientations for incoming university students could include psychoeducation in the form of written materials (e.g., pamphlets) and discussions about how students tend to have misperceptions about drinking norms and behaviours (Borsari & Carey, 2001; Neighbors, Fossos, et al., 2007; Perkins et al., 1999, 2005). Overall, our findings could add important specificity to clinical interventions by allowing us to gain a better understanding of what factors could contribute to an increased efficacy and effectiveness of PFIs.

Limitations and Future Research

There are some limitations of the current study. First, due to the correlational, cross-sectional nature of the study, we were not able to infer causal directional relationships between the variables. Future research could conduct a multi-wave longitudinal study assessing participants at multiple time points throughout their university degree. This would allow one to analyze how relevant normative perceptions shift over the course of a person’s time at university. Analyzing variables throughout one’s university degree is relevant considering that, compared to older students, younger university students have been found to be more likely to engage in heavy alcohol use (Kuo et al., 2002). Second, results relied on self-reported retrospective alcohol use, which could be subject to memory errors (LaBrie et al., 2008). Third, we did not collect information about where students were living. Therefore, we could not properly assess parents as

a reference group for drinking norms, since parents may be more relevant to university students living at home compared to students living away from home.

A fourth limitation is that the study sample only included university students enrolled in psychology courses at various universities in Canada. Research on perceived norms about drinking is frequently conducted among the university population. Examining this sample is fundamental considering that university students may be at a higher risk of alcohol use and related problems compared to the general population (Andrews & Westling, 2014; Crum & Pratt, 2001; Dawson et al., 2005; Johnston et al., 2010; Neighbors, Fossos, et al., 2007; Schulenberg et al., 2020; Slutske, 2005). However, findings from the current study may not be generalizable to a broader population of emerging adults who do not attend postsecondary schooling. Therefore, future research should analyze the influence of injunctive norms about specific risky drinking behaviours among the broader population, including among non-university students. It could also be analyzed among more specific samples, including individuals presenting with other symptoms of anxiety, depression, and other mental health symptoms. This could include analyzing the relationships from the current study among individuals with clinical levels of social anxiety (Neighbors, Fossos, et al., 2007). Such research could aid in the development of appropriate prevention and intervention techniques based on relevant injunctive norms (Hines et al., 2024). Furthermore, future research could study these variables among students in the United States given the different legal drinking age and drinking patterns (Kuo et al., 2002). Notably, Canadian university students have been found to have higher rates of past year and lifetime alcohol use while students living in the United States tend to have higher rates of heavy alcohol use in the past week and past year (Kuo et al., 2002).

In conclusion, this study is the first to examine the impact of perceived approval of specific risky drinking behaviours on risky alcohol behaviours among students with relatively elevated social anxiety. Our study has notable clinical implications: Such findings could contribute to the improvement of intervention techniques for correcting misconceptions about drinking norms. Those who study perceived norms in the future should consider examining specific drinking behaviours to ensure the relations between different normative beliefs and drinking practices are appropriately captured.

References

- Adams, T., Rapinda, K. K., Frohlich, J. R., O'Connor, R. M., & Keough, M. T. (2019). Impulsivity moderates the effect of social anxiety on in-lab alcohol craving. *Addictive Behaviors*, 97, 70–76. <https://doi.org/10.1016/j.addbeh.2019.05.025>
- Aderka, I. M., Hofmann, S. G., Nickerson, A., Hermesh, H., Gilboa-Schechtman, E., & Marom, S. (2012). Functional impairment in social anxiety disorder. *Journal of Anxiety Disorders*, 26(3), 393–400. <https://doi.org/10.1016/j.janxdis.2012.01.003>
- American Psychiatric Association. (2022). *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5-TR). American Psychiatric Association Publishing. <https://doi.org/10.1176/appi.books.9780890425787>
- Andrews, J. A., & Westling, E. (2014). *Substance Use in Emerging Adulthood* (J. J. Arnett, Ed.; Vol. 1). Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780199795574.013.20>
- Arjanggi, R., & Kusumaningsih, L. P. S. (2016). College Adjustment of First Year Students: The Role of Social Anxiety. *Journal of Educational, Health and Community Psychology*, 5(1), 30. <https://doi.org/10.12928/jehcp.v5i1.4273>
- Arnett, J. J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American Psychologist*, 55(5), 469–480. <https://doi.org/10.1037/0003-066X.55.5.469>
- Arnett, J. J., Žukauskienė, R., & Sugimura, K. (2014). The new life stage of emerging adulthood at ages 18–29 years: Implications for mental health. *The Lancet Psychiatry*, 1(7), 569–576. [https://doi.org/10.1016/S2215-0366\(14\)00080-7](https://doi.org/10.1016/S2215-0366(14)00080-7)

- Baer, J. S. (1994). Effects of college residence on perceived norms for alcohol consumption: An examination of the first year in college. *Psychology of Addictive Behaviors*, 8(1), 43–50. <https://doi.org/10.1037/0893-164X.8.1.43>
- Berkowitz, A. D. (2004). *The social norms approach: Theory, research, and annotated bibliography*.
- Book, S. W., & Randall, C. L. (2002). *Social anxiety disorder and alcohol use*. 26(2), 130–135.
- Borsari, B., & Carey, K. B. (2001). Peer influences on college drinking: A review of the research. *Journal of Substance Abuse*, 13(4), 391–424. [https://doi.org/10.1016/S0899-3289\(01\)00098-0](https://doi.org/10.1016/S0899-3289(01)00098-0)
- Buckner, J. D., Ecker, A. H., & Proctor, S. L. (2011). Social anxiety and alcohol problems: The roles of perceived descriptive and injunctive peer norms. *Journal of Anxiety Disorders*, 25(5), 631–638. <https://doi.org/10.1016/j.janxdis.2011.02.003>
- Buckner, J. D., Ledley, D. R., Heimberg, R. G., & Schmidt, N. B. (2008). Treating comorbid social anxiety and alcohol use disorders: Combining motivation enhancement therapy with cognitive-behavioral therapy. *Clinical Case Studies*, 7(3), 208–223. <https://doi.org/10.1177/1534650107306877>
- Buckner, J. D., & Schmidt, N. B. (2009). Understanding social anxiety as a risk for alcohol use disorders: Fear of scrutiny, not social interaction fears, prospectively predicts alcohol use disorders. *Journal of Psychiatric Research*, 43(4), 477–483. <https://doi.org/10.1016/j.jpsychires.2008.04.012>
- Buckner, J. D., Schmidt, N. B., Lang, A. R., Small, J. W., Schlauch, R. C., & Lewinsohn, P. M. (2008). Specificity of social anxiety disorder as a risk factor for alcohol and cannabis

- dependence. *Journal of Psychiatric Research*, 42(3), 230–239.
<https://doi.org/10.1016/j.jpsychires.2007.01.002>
- Campbell, C. G., Bierman, K. L., & Molenaar, P. C. M. (2016). Individual Day-to-Day Process of Social Anxiety in Vulnerable College Students. *Applied Developmental Science*, 20(1), 1–15. <https://doi.org/10.1080/10888691.2015.1026594>
- Carpenter, K. M., & Hasin, D. S. (1999). Drinking to cope with negative affect and DSM-IV alcohol use disorders: A test of three alternative explanations. *Journal of Studies on Alcohol*, 60(5), 694–704. <https://doi.org/10.15288/jsa.1999.60.694>
- Collins, S. E., & Spelman, P. J. (2013). Associations of descriptive and reflective injunctive norms with risky college drinking. *Psychology of Addictive Behaviors*, 27(4), 1175–1181. <https://doi.org/10.1037/a0032828>
- Conger, J. J. (1956). Alcoholism: Theory, problem and challenge. II. Reinforcement theory and the dynamics of alcoholism. *Quarterly Journal of Studies on Alcohol*, 17(2), 296–305.
- Cooper, M. L. (1994). Motivations for alcohol use among adolescents: Development and validation of a four-factor model. *Psychological Assessment*, 6(2), 117–128. <https://doi.org/10.1037/1040-3590.6.2.117>
- Crum, R. M., & Pratt, L. A. (2001). Risk of heavy drinking and alcohol use disorders in social phobia: A prospective analysis. *American Journal of Psychiatry*, 158(10), 1693–1700. <https://doi.org/10.1176/appi.ajp.158.10.1693>
- Dawson, D. A., Grant, B. F., Stinson, F. S., & Chou, P. S. (2005). Psychopathology associated with drinking and alcohol use disorders in the college and general adult populations. *Drug and Alcohol Dependence*, 77(2), 139–150. <https://doi.org/10.1016/j.drugalcdep.2004.07.012>

- Dumas, T. M., Davis, J. P., & Neighbors, C. (2019). How much does your peer group really drink? Examining the relative impact of overestimation, actual group drinking and perceived campus norms on university students' heavy alcohol use. *Addictive Behaviors*, 90, 409–414. <https://doi.org/10.1016/j.addbeh.2018.11.041>
- Ecker, A. (2013). Multi-informant investigation of college student drinking behaviors and social anxiety: The role of perceived descriptive and injunctive norms. *LSU Master's Theses*. https://doi.org/10.31390/gradschool_theses.3347
- Edkins, T., Edgerton, J. D., & Roberts, L. W. (2017). Correlates of binge drinking in a sample of Canadian university students. *International Journal of Child, Youth and Family Studies*, 8(1), 112. <https://doi.org/10.18357/ijcyfs81201716944>
- Festinger, L. (1954). A Theory of Social Comparison Processes. *Human Relations*, 7(2), 117–140. <https://doi.org/10.1177/001872675400700202>
- Fritz, M. S., & MacKinnon, D. P. (2007). Required sample size to detect the mediated effect. *Psychological Science*, 18(3), 233–239. <https://doi.org/10.1111/j.1467-9280.2007.01882.x>
- Government of Canada. (2023, June 28). *Canadian Alcohol and Drugs Survey (CADS): Summary of results for 2019* [Surveys]. <https://www.canada.ca/en/health-canada/services/canadian-alcohol-drugs-survey/2019-summary.html>
- Government of Canada. (2021, October 4). *The Daily — Study: Youth and education in Canada*. <https://www150.statcan.gc.ca/n1/daily-quotidien/211004/dq211004c-eng.htm>
- Grant, B. F., Hasin, D. S., Blanco, C., Stinson, F. S., Chou, S. P., Goldstein, R. B., Dawson, D. A., Smith, S., Saha, T. D., & Huang, B. (2005). The epidemiology of social anxiety disorder in the United States: Results from the National Epidemiologic Survey on

- Alcohol and Related Conditions. *The Journal of Clinical Psychiatry*, 66(11), 1351–1361.
<https://doi.org/10.4088/JCP.v66n1102>
- Hakami, R. M., Mahfouz, M. S., Adawi, A. M., Mahha, A. J., Athathi, A. J., Daghreeri, H. H., Najmi, H. H., & Arishi, N. A. (2018). Social anxiety disorder and its impact in undergraduate students at Jazan University, Saudi Arabia. *Mental Illness*, 9(2).
<https://doi.org/10.4081/mi.2017.7274>
- Hallett, J., Howat, P. M., Maycock, B. R., McManus, A., Kypri, K., & Dhaliwal, S. S. (2012). Undergraduate student drinking and related harms at an Australian university: Web-based survey of a large random sample. *BMC Public Health*, 12(37).
<https://doi.org/10.1186/1471-2458-12-37>
- Ham, L. S., Bacon, A. K., Carrigan, M. H., Zamboanga, B. L., & Casner, H. G. (2016). Social anxiety and alcohol use: The role of alcohol expectancies about social outcomes. *Addiction Research & Theory*, 24(1), 9–16.
<https://doi.org/10.3109/16066359.2015.1036242>
- Hart, E., & Burns, S. (2016). The relationship between alcohol consumption and related harm among young university students. *Health Promotion Journal of Australia*, 27(1), 15–20.
<https://doi.org/10.1071/HE15086>
- Hines, S. A., Morin, A. J. S., Norman, P., Read, J. P., & O'Connor, R. M. (2024). Development and validation of the perceived approval of Risky Drinking Inventory in undergraduate students. *Psychology of Addictive Behaviors*, No Pagination Specified-No Pagination Specified. <https://doi.org/10.1037/adb0000990>
- Hodgins, D. C., Wilson, K. E., & Schluter, M. G. (2023). Validation and performance of the Brief Screener for Substance and Behavioural Addiction (SSBA) amongst university students.

International Journal of Mental Health and Addiction, 21(4), 2718–2736.

<https://doi.org/10.1007/s11469-021-00748-z>

Johnston, L. D., O'Malley, P. M., Bachman, J. G., & Schulenberg, J. E. (2010). *Monitoring the Future—National Survey Results on Drug Use, 1975-2009, Volume II*. National Institute on Drug Abuse.

Keough, M. T., Badawi, G., Nitka, D., O'Connor, R. M., & Stewart, S. H. (2016). Impulsivity increases risk for coping-motivated drinking in undergraduates with elevated social anxiety. *Personality and Individual Differences*, 88, 45–50.

<https://doi.org/10.1016/j.paid.2015.08.036>

Keough, M. T., Battista, S. R., O'Connor, R. M., Sherry, S. B., & Stewart, S. H. (2016). Getting the party started — Alone: Solitary predrinking mediates the effect of social anxiety on alcohol-related problems. *Addictive Behaviors*, 55, 19–24.

<https://doi.org/10.1016/j.addbeh.2015.12.013>

Kessler, R. C., Berglund, P., Demler, O., Jin, R., Merikangas, K. R., & Walters, E. E. (2005). Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry*, 62(6), 593.

<https://doi.org/10.1001/archpsyc.62.6.593>

Khakpoor, S., Saed, O., & Shahsavar, A. (2019). The concept of “Anxiety sensitivity” in social anxiety disorder presentations, symptomatology, and treatment: A theoretical perspective. *Cogent Psychology*, 6(1), 1617658. <https://doi.org/10.1080/23311908.2019.1617658>

Kindred, R., & Bates, G. (2023). The influence of the COVID-19 pandemic on social anxiety: A systematic review. *International Journal of Environmental Research and Public Health*, 20(3), 2362. <https://doi.org/10.3390/ijerph20032362>

- Kline, R. B. (2005). *Principles and practice of structural equation modeling* (2nd ed). Guilford Press.
- Krebs, C. P., Lindquist, C. H., Warner, T. D., Fisher, B. S., & Martin, S. L. (2009). College women's experiences with physically forced, alcohol- or other drug-enabled, and drug-facilitated sexual assault before and since entering college. *Journal of American College Health, 57*(6), 639–649. <https://doi.org/10.3200/JACH.57.6.639-649>
- Kuo, M., Adlaf, E. M., Lee, H., Gliksman, L., Demers, A., & Wechsler, H. (2002). More Canadian students drink but American students drink more: Comparing college alcohol use in two countries. *Addiction, 97*(12), 1583–1592. <https://doi.org/10.1046/j.1360-0443.2002.00240.x>
- LaBrie, J. W., Hummer, J. F., & Neighbors, C. (2008). Self-consciousness moderates the relationship between perceived norms and drinking in college students. *Addictive Behaviors, 33*(12), 1529–1539. <https://doi.org/10.1016/j.addbeh.2008.07.008>
- LaBrie, J. W., Hummer, J. F., Neighbors, C., & Larimer, M. E. (2010). Whose opinion matters? The relationship between injunctive norms and alcohol consequences in college students. *Addictive Behaviors, 35*(4), 343–349. <https://doi.org/10.1016/j.addbeh.2009.12.003>
- Latané, B. (1981). The psychology of social impact. *American Psychologist, 36*(4), 343–356. <https://doi.org/10.1037/0003-066X.36.4.343>
- Lee, C. M., Geisner, I. M., Lewis, M. A., Neighbors, C., & Larimer, M. E. (2007). Social motives and the interaction between descriptive and injunctive norms in college student drinking. *Journal of Studies on Alcohol and Drugs, 68*(5), 714–721. <https://doi.org/10.15288/jsad.2007.68.714>

- Leigh, E., & Clark, D. M. (2018). Understanding social anxiety disorder in adolescents and improving treatment outcomes: Applying the cognitive model of Clark and Wells (1995). *Clinical Child and Family Psychology Review*, 21(3), 388–414.
<https://doi.org/10.1007/s10567-018-0258-5>
- Linden, A. N., Lau-Barraco, C., & Braitman, A. L. (2012). Social anxiety among young adult drinkers: The role of perceived norms and drinking motives. *Journal of Drug Education*, 42(3), 293–313. <https://doi.org/10.2190/DE.42.3.c>
- Luan, Y.-S., Zhan-ling, G., Mi, L., Ying, L., Lan, B., & Tong, L. (2022). The experience among college students with social anxiety disorder in social situations: A qualitative study. *Neuropsychiatric Disease and Treatment*, Volume 18, 1729–1737.
<https://doi.org/10.2147/NDT.S371402>
- Mallett, K. A., Bachrach, R. L., & Turrisi, R. (2008). Are all negative consequences truly negative? Assessing variations among college students' perceptions of alcohol related consequences. *Addictive Behaviors*, 33(10), 1375–1381.
<https://doi.org/10.1016/j.addbeh.2008.06.014>
- Mattern, J. L., & Neighbors, C. (2004). Social norms campaigns: Examining the relationship between changes in perceived norms and changes in drinking levels. *Journal of Studies on Alcohol*, 65(4), 489–493. <https://doi.org/10.15288/jsa.2004.65.489>
- Mattick, R. P., & Clarke, J. C. (1998). Development and validation of measures of social phobia scrutiny fear and social interaction anxiety¹Editor's note: This article was written before the development of some contemporary measures of social phobia, such as the Social Phobia and Anxiety Inventory (Turner et al., 1989). We have invited this article for

- publication because of the growing interest in the scales described therein. S.T. *Behaviour Research and Therapy*, 36(4), 455–470. [https://doi.org/10.1016/S0005-7967\(97\)10031-6](https://doi.org/10.1016/S0005-7967(97)10031-6)
- Merrill, J. E., Wardell, J. D., & Read, J. P. (2014). Drinking motives in the prospective prediction of unique alcohol-related consequences in college students. *Journal of Studies on Alcohol and Drugs*, 75(1), 93–102. <https://doi.org/10.15288/jsad.2014.75.93>
- Neighbors, C., Dillard, A. J., Lewis, M. A., Bergstrom, R. L., & Neil, T. A. (2006). Normative misperceptions and temporal precedence of perceived norms and drinking. *Journal of Studies on Alcohol*, 67(2), 290–299. <https://doi.org/10.15288/jsa.2006.67.290>
- Neighbors, C., Fossos, N., Woods, B. A., 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(1), 91–96. <https://doi.org/10.15288/jsad.2007.68.91>
- Neighbors, C., Larimer, M. E., & Lewis, M. A. (2004). Targeting misperceptions of descriptive drinking norms: Efficacy of a computer-delivered personalized normative feedback intervention. *Journal of Consulting and Clinical Psychology*, 72(3), 434–447. <https://doi.org/10.1037/0022-006X.72.3.434>
- Neighbors, C., Lee, C. M., Lewis, M. A., Fossos, N., & Larimer, M. E. (2007). Are social norms the best predictor of outcomes among heavy-drinking college students? *Journal of Studies on Alcohol and Drugs*, 68(4), 556–565. <https://doi.org/10.15288/jsad.2007.68.556>
- Neighbors, C., O'Connor, R. M., Lewis, M. A., Chawla, N., Lee, C. M., & Fossos, N. (2008). The relative impact of injunctive norms on college student drinking: The role of reference group. *Psychology of Addictive Behaviors*, 22(4), 576–581. <https://doi.org/10.1037/a0013043>

- Nitka, D., & O'Connor, R. M. (2017). Evaluations of alcohol consequences moderate social anxiety risk for problematic drinking. *Addictive Behaviors*, 65, 131–136.
<https://doi.org/10.1016/j.addbeh.2016.10.005>
- Osberg, T. M., Bird, C., Mouso, L., Hearn, L., Foulis, J., Mundy, A., & Scalzo, A. (2021). Going against the norm: A mixed methods analysis of college students' arguments against the college drinking culture. *Substance Use & Misuse*, 56(14), 2242–2251.
<https://doi.org/10.1080/10826084.2021.1981392>
- Pan, Z., Zhang, D., Hu, T., & Pan, Y. (2018). The relationship between psychological Suzhi and social anxiety among Chinese adolescents: The mediating role of self-esteem and sense of security. *Child and Adolescent Psychiatry and Mental Health*, 12(1), 50.
<https://doi.org/10.1186/s13034-018-0255-y>
- Pearson, M. R., & Hustad, J. T. P. (2014). Personality and alcohol-related outcomes among mandated college students: Descriptive norms, injunctive norms, and college-related alcohol beliefs as mediators. *Addictive Behaviors*, 39(5), 879–884.
<https://doi.org/10.1016/j.addbeh.2014.01.008>
- Perkins, H. W., Haines, M. P., & Rice, R. (2005). Misperceiving the college drinking norm and related problems: A nationwide study of exposure to prevention information, perceived norms and student alcohol misuse. *Journal of Studies on Alcohol*, 66(4), 470–478.
<https://doi.org/10.15288/jsa.2005.66.470>
- Perkins, H. W., Meilman, P. W., Leichliter, J. S., Cashin, J. R., & Presley, C. A. (1999). Misperceptions of the norms for the frequency of alcohol and other drug Use on college campuses. *Journal of American College Health*, 47(6), 253–258.
<https://doi.org/10.1080/07448489909595656>

- Prince, M. A., & Carey, K. B. (2010). The malleability of injunctive norms among college students. *Addictive Behaviors*, 35(11), 940–947.
<https://doi.org/10.1016/j.addbeh.2010.06.006>
- Rabow, J., & Duncan-Schill, M. (1995). *Drinking among college students*. 40(3), 52–64.
- Ratnani, I., Vala, A., Panchal, B., Tiwari, D., Karambelkar, S., Sojitra, M., & Nagori, N. (2017). Association of social anxiety disorder with depression and quality of life among medical undergraduate students. *Journal of Family Medicine and Primary Care*, 6(2), 243.
<https://doi.org/10.4103/2249-4863.219992>
- Robinson, E., Jones, A., Christiansen, P., & Field, M. (2014). Perceived peer drinking norms and responsible drinking in UK university settings. *Substance Use & Misuse*, 49(11), 1376–1384. <https://doi.org/10.3109/10826084.2014.901390>
- Russell, G., & Topham, P. (2012). The impact of social anxiety on student learning and well-being in higher education. *Journal of Mental Health*, 21(4), 375–385.
<https://doi.org/10.3109/09638237.2012.694505>
- Saxton, J., Rodda, S. N., Booth, N., Merkouris, S. S., & Dowling, N. A. (2021). The efficacy of Personalized Normative Feedback interventions across addictions: A systematic review and meta-analysis. *PLOS ONE*, 16(4), e0248262.
<https://doi.org/10.1371/journal.pone.0248262>
- Schluter, M. G., Hodgins, D. C., Wolfe, J., & Wild, T. C. (2018). Can one simple questionnaire assess substance-related and behavioural addiction problems? Results of a proposed new screener for community epidemiology. *Addiction*, 113(8), 1528–1537.
<https://doi.org/10.1111/add.14166>

- Schneier, F., & Goldmark, J. (2015). Social Anxiety Disorder. In D. J. Stein & B. Vythilingum (Eds.), *Anxiety Disorders and Gender* (pp. 49–67). Springer International Publishing.
https://doi.org/10.1007/978-3-319-13060-6_3
- Schneier, F. R., Foose, T. E., Hasin, D. S., Heimberg, R. G., Liu, S.-M., Grant, B. F., & Blanco, C. (2010). Social anxiety disorder and alcohol use disorder co-morbidity in the National Epidemiologic Survey on Alcohol and Related Conditions. *Psychological Medicine*, 40(6), 977–988. <https://doi.org/10.1017/S0033291709991231>
- Schry, A. R., & White, S. W. (2013). Understanding the relationship between social anxiety and alcohol use in college students: A meta-analysis. *Addictive Behaviors*, 38(11), 2690–2706. <https://doi.org/10.1016/j.addbeh.2013.06.014>
- Schulenberg, J. E., Johnston, L. D., O'Malley, P. M., Bachman, J. G., Miech, R. A., & Patrick, M. E. (2020). *Monitoring the future: National survey results on drug use, 1975–2019: Vol. Volume II, College students and adults ages 19–60*.
- Senter, M. S. (2024). The Impact of Social Relationships on College Student Learning during the Pandemic: Implications for Sociologists. *Teaching Sociology*, 52(1), 39–54.
<https://doi.org/10.1177/0092055X231178505>
- Sher, K. J. (Ed.). (2014). *The Oxford Handbook of Substance Use and Substance Use Disorders Volume I* (Vol. 1). Oxford University Press.
<https://doi.org/10.1093/oxfordhb/9780199381678.001.0001>
- Single, A., Bilevicius, E., Ho, V., Theule, J., Buckner, J. D., Mota, N., & Keough, M. T. (2022). Cannabis use and social anxiety in young adulthood: A meta-analysis. *Addictive Behaviors*, 129, 107275. <https://doi.org/10.1016/j.addbeh.2022.107275>

- Slutske, W. S. (2005). Alcohol use disorders among US college students and their non-college-attending peers. *Archives of General Psychiatry*, 62(3), 321.
<https://doi.org/10.1001/archpsyc.62.3.321>
- Stein, M. B., & Stein, D. J. (2008). Social anxiety disorder. *The Lancet*, 371(9618), 1115–1125.
[https://doi.org/10.1016/S0140-6736\(08\)60488-2](https://doi.org/10.1016/S0140-6736(08)60488-2)
- Stewart, S. H., Morris, E., Mellings, T., & Komar, J. (2006). Relations of social anxiety variables to drinking motives, drinking quantity and frequency, and alcohol-related problems in undergraduates. *Journal of Mental Health*, 15(6), 671–682.
<https://doi.org/10.1080/09638230600998904>
- Stewart, S. H., & Zeitlin, S. B. (1995). Anxiety sensitivity and alcohol use motives. *Journal of Anxiety Disorders*, 9(3), 229–240. [https://doi.org/10.1016/0887-6185\(95\)00004-8](https://doi.org/10.1016/0887-6185(95)00004-8)
- Substance Abuse and Mental Health Services Administration. (2022). *Key substance use and mental health indicators in the United States: Results from the 2021 National Survey on Drug Use and Health* (HHS Publication No. PEP22-07-01-005, NSDUH Series H-57). Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration. <https://www.samhsa.gov/data/report/2021-nsduh-annual-national-report>
- Tabachnick, B. G., & Fidell, L. S. (2013). *Using Multivariate Statistics* (6th ed.). Pearson.
- Tanner, J. L. (2015). *Mental Health in Emerging Adulthood* (J. J. Arnett, Ed.; Vol. 1). Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780199795574.013.30>
- Tembo, C., Burns, S., & Kalembo, F. (2017). The association between levels of alcohol consumption and mental health problems and academic performance among young

- university students. *PLOS ONE*, 12(6), e0178142.
<https://doi.org/10.1371/journal.pone.0178142>
- Terlecki, M. A., & Buckner, J. D. (2015). Social anxiety and heavy situational drinking: Coping and conformity motives as multiple mediators. *Addictive Behaviors*, 40, 77–83.
<https://doi.org/10.1016/j.addbeh.2014.09.008>
- Terlecki, M. A., Buckner, J. D., Larimer, M. E., & Copeland, A. L. (2012). Brief motivational intervention for college drinking: The synergistic impact of social anxiety and perceived drinking norms. *Psychology of Addictive Behaviors*, 26(4), 917–923.
<https://doi.org/10.1037/a0027982>
- Urani, M. A., Miller, S. A., Johnson, J. E., & Petzel, T. P. (2003). Homesickness in socially anxious first year college students. *College Student Journal*, 37(3), 392–399.
- White, A., & Hingson, R. (2013). The burden of alcohol use: Excessive alcohol consumption and related consequences among college students. *Alcohol Research: Current Reviews*, 35(2), 201–218.
- Willis, L., Lee, E., Reynolds, K. J., & Klik, K. A. (2020). The theory of planned behavior and the social identity approach: A new look at group processes and social norms in the context of student binge drinking. *Europe's Journal of Psychology*, 16(3), 357–383.
<https://doi.org/10.5964/ejop.v16i3.1900>
- World Health Organization. (2022). *Mental disorders*. World Health Organization.
<https://www.who.int/news-room/fact-sheets/detail/mental-disorders>
- Yanovitzky, I., Stewart, L. P., & Lederman, L. C. (2006). Social distance, perceived drinking by peers, and alcohol use by college students. *Health Communication*, 19(1), 1–10.
https://doi.org/10.1207/s15327027hc1901_1

Appendix

Perceived Approval of Risky Drinking Inventory (PARDI)

Please use the scale below to indicate how much you believe each specified group (your friends, your parents, and typical students at your university) would approve of each of the following behaviors.

1 = strongly disapprove

2 = somewhat disapprove

3 = neutral or indifferent

4 = somewhat approve

5 = strongly approve

1. You drinking a large amount of alcohol quickly (e.g., chugging instead of sipping, drinking shots, binge drinking).
2. You playing drinking games (i.e., social games that encourage or require drinking alcohol).
3. You drinking various types of alcohol (e.g., beer, wine, liquor) over a single drinking occasion.
4. You drinking alcohol prior to going out (e.g., to a bar or party) to get intoxicated beforehand (i.e., predrinking, pregaming).
5. You passing out as a result of drinking (i.e., drinking so much that you lose consciousness).
6. You blacking out as a result of drinking (i.e., not having a memory of what occurred during a drinking occasion).
7. You vomiting as a result of drinking too much.
8. You drinking in ways that were inappropriate to the context (e.g., chugging at dinner while others are sipping).

9. You being unable to limit the amount you drink once you start (i.e., you were unable to stop or drank more than you intended to).
10. You having sex with someone while intoxicated that you would not have if you were sober.
11. You having sex using less protection than you normally use (e.g., not using condoms) because you are intoxicated.
12. You being in a risky sexual situation while intoxicated (e.g., going home with a stranger, flirting when you did not want it to go further).
13. You drinking with the intention of getting drunk.
14. You drinking to help you forget about your problems.
15. You drinking to forget your worries.
16. You drinking because it helps you when you are feeling depressed.
17. You drinking to stop you from feeling so hopeless about the future.
18. You drinking to reduce your anxiety.
19. You drinking because it makes it easier to be social when you are feeling nervous.
20. You drinking to reduce physical tension (e.g., sweating, racing heart).