



Published in final edited form as:

Psychol Addict Behav. 2014 September ; 28(3): 880–886. doi:10.1037/a0036813.

Evaluating Age Differences in Coping Motives as a Mediator of the Link between Social Anxiety Symptoms and Alcohol Problems

Elise M. Clerkin,

University of Miami

Alexandra J. Werntz,

University of Virginia

Joshua C. Magee,

University of Cincinnati

Kristen P. Lindgren, and

University of Washington

Bethany A. Teachman

University of Virginia

Abstract

The goal of this study is to evaluate whether coping motives mediate the relationship between self-reported symptoms of social anxiety and alcohol problems across different age groups, building upon previous research conducted among emerging adults. This study focuses on adult drinkers, including emerging adults (age 18–25; $n = 148$), young adults (age 26–39; $n = 68$), and middle-aged adults (age 40–65; $n = 51$). All participants completed measures of social anxiety symptoms, alcohol problems, and coping motives, administered via the web. Invariance tests using structural equation modeling suggested that among emerging adults (and to some degree middle-aged adults), coping motives mediated the positive relationship between symptoms of social anxiety and alcohol problems. Interestingly, coping motives appeared to suppress a negative relationship between social anxiety and alcohol problems in young adults. Results suggest that it is critical to consider age differences when attempting to understand the relationships between symptoms of social anxiety, alcohol problems, and coping motives.

Keywords

Alcohol problems; social anxiety; coping motives; age; emerging adults; middle-aged adults

Past research indicates that among emerging adults, greater coping motives (i.e., drinking to reduce negative affect) may mediate the relationship between symptoms of social anxiety and problems associated with drinking (e.g., Ham, Zamboanga, Bacon, & Garcia, 2009).

Importantly, a recent meta-analysis suggests that while college students with social anxiety symptoms are less likely to consume alcohol *in general* (e.g., typical quantity and frequency), social anxiety is associated with more alcohol-related problems (Schry & White, 2013). It may be that emerging adults with social anxiety tend to be high in coping motives, and thus feel especially motivated to drink when they are in social situations with high negative affect. Drinking in such situations may be more likely to result in problems than drinking in other, less risky situations. Critically, published research evaluating coping motives as a mediator of social anxiety symptoms and alcohol-related problems has only been conducted with emerging adults. Given normative developmental shifts that lead to reductions in problematic alcohol use (e.g., Littlefield, Sher, & Wood, 2010) and symptoms of social anxiety (e.g., Fehm, Beesdo, Jacobi, & Fiedler, 2008) with age, it is important to test whether coping motives will mediate the social anxiety-alcohol problem relationship in older individuals. Thus, the current study investigates coping motives as a mediator of the social anxiety-alcohol problems relationship across a broad age range of adult drinkers, and evaluates potential age-related differences in this mediation pattern.

The current project builds upon previous research to provide a developmentally-informed perspective on the relationship between social anxiety, alcohol problems, and coping motives. We focus specifically on emerging adults (age 18–25), young adults (age 26–39), and middle-aged adults (age 40–65). Our hypotheses are as follows:

1. For emerging adults, we expect that greater social anxiety symptoms will be associated with greater alcohol-related problems, as well as greater coping motives. Consistent with previous findings (e.g., Schry & White, 2013), we expect that coping motives will mediate the relationship between social anxiety symptoms and alcohol-related problems. We expect that this relationship will not be better accounted for by other drinking motives or alcohol consumption.
2. We consider two competing hypotheses for the young and middle-aged adult groups. First, it is possible that adults age 26+ will show a similar pattern of relationships as the emerging adult age group, given coping motives have been found to be positively related to alcohol-related problems, heavy drinking, and social anxiety symptoms in young and middle-aged adults (see Littlefield et al., 2010; Thomas, Randall, & Carrigan, 2003). Alternatively, to the extent aging is associated with less impact from social threats and enhanced emotion regulation skills (see Teachman & Gordon, 2009), then the perceived need to drink to manage these threats may diminish with age. This suggests a second, competing hypothesis that coping motives may play less of a mediating role among middle-aged adults relative to emerging adults (with young adults' results presumably falling in between their younger and older counterparts).

Method¹

This IRB-approved study was administered through the Project Implicit website (www.implicit.harvard.edu). With approximately 10,000 completed study sessions per week, the pool of Project Implicit participants is large and diverse.² Individuals registered on the site were randomly assigned to the current study from a pool of ongoing social cognition studies.

Participants

Participants were 267 adult drinkers aged 18–65 who reported that they: 1) drank at least once during the past month; and 2) drank at least 1 drink on a typical week during the past month. To be included, participants needed to provide data for each primary variable of interest. See Table 1 for sample characteristics (additional detail is available from the first author).

Measures and Materials

Daily Drinking Questionnaire (DDQ; Collins, Parks, & Marlatt, 1985)—The consumption variable reflected the average number of drinks reported per day over the course of a typical week during the previous month. Responses ranged from 0 to 6 with the following response options: 0, 1–2, 3–4, 5–7, 8–11, 12–23, 24 or more drinks. ($\alpha = .81$). See Table 1 for additional drinking quantity and frequency measures (assessed with the DDQ), which were used for inclusion criteria and/or to characterize the sample.

Drinking Motives Questionnaire-Revised (DMQR; Cooper, 1994)—This 20-item questionnaire assesses four motivations for drinking, including coping (i.e., to alleviate negative affect; $\alpha = .82$), social (i.e., to maximize social rewards; $\alpha = .90$), enhancement (i.e., to heighten positive affect; $\alpha = .88$), and conformity (i.e., to avoid being rejected socially; $\alpha = .76$) motives.

Short Inventory of Problems (SIP-2R; Miller, Tonigan, & Longabaugh, 1995)—This 15-item questionnaire assesses the adverse consequences of alcohol use over the previous three months, across the following five domains: physical, social responsibility, intrapersonal, impulse, and interpersonal ($\alpha = .91$). It was used as a proxy for alcohol-related problems.

Brief Fear of Negative Evaluation Scale (BFNE; Leary, 1983)—This 12-item measure assesses fear tied to negative social evaluation, and was used as a proxy for social anxiety symptoms given evidence that this measure distinguishes between individuals with and without social anxiety disorder (Rapee & Heimberg, 1997; Weeks et al., 2005) ($\alpha = .90$).

¹Only measures relevant to the current hypotheses are included here. Participants also completed a Brief Implicit Association Test (Sriram & Greenwald, 2009). For additional detail regarding the website, this task, and other measures that participants completed, please contact the first author.

²Note that the Project Implicit infrastructure used to recruit participants only allows adults, aged 18+ to participate. While Project Implicit samples are not representative of the general population, they allow for examination of individual differences because of the relative heterogeneity. A number of articles detail the correspondence of Project Implicit samples to the U.S. population (see Nosek, 2005; Nosek et al., 2007).

Procedure

After informed consent, volunteers completed the following questionnaires, which were administered in random order: DDQ, DMQ, SIP-2R, and BFNE.

Data Analytic Plan

To examine the relationships among social anxiety, coping motives, and alcohol problems across age groups, structural equation modeling (SEM) in AMOS 21 was used. This approach modeled the set of regression analyses examining our mediation hypotheses, and tested whether relationships with coping motives were invariant across the three age groups or better accounted for by other drinking motives or alcohol consumption. Because the measures of coping motives and alcohol problems were significantly positively skewed, bias-corrected bootstrapping was used in all structural equation models. This method is robust against violations of multivariate normality and provides bias-corrected estimates of confidence intervals in mediation (MacKinnon, Lockwood, & Williams, 2004). Following Shrout and Bolger (2002), we examined all mediation pathways of interest, regardless of the initial $X \rightarrow Y$ association. This decision also follows past research on social anxiety and alcohol that has sometimes found suppression effects by proposed mediators, such that a negative relationship between social anxiety and alcohol variables is evident once the mediator is entered (Eggleston, Woolaway-Bickel, & Schmidt, 2004).

Results

Age Differences in Social Anxiety, Drinking Motives, and Alcohol Problems

Please see Table 1 for demographic information, and means and standard deviations for the measures of social anxiety (BFNE), drinking motives (DMQ), alcohol problems (SIP), and drinking quantity and frequency, including tests of mean differences across age groups.

The sample included a broad range of clinical symptom severity, with 11% scoring above the pretreatment BFNE mean for a sample diagnosed with social anxiety disorder (Weeks et al., 2005), and 13% scoring above the pretreatment SIP mean for a sample of “problem drinkers” interested in reducing or stopping drinking (Feinn, Tennen, & Kranzler, 2003). Pointing to our sample’s representativeness, this is comparable to lifetime prevalence rates of social phobia (12.1%) and alcohol abuse (13.2%) in nationally representative surveys (Kessler et al., 2005).

Coping Motives as a Mediator of the Link between Social Anxiety and Alcohol Problems

We tested whether coping motives (as assessed by the coping subscale of the DMQR) would mediate the relationship between social anxiety and alcohol problems in the full sample. We used SEM to test Baron and Kenny’s (1986) guidelines for mediation, as well as MacKinnon, Lockwood, Hoffman, West, and Sheets’ (2002) method for determining the size of the indirect effect of social anxiety on alcohol problems via coping motives. First, we tested whether social anxiety would significantly predict alcohol problems. Next, we tested whether social anxiety would predict coping motives, and whether coping motives would predict alcohol problems. To test for full mediation, we used two criteria: 1) the significant relationship between social anxiety and alcohol problems should become non-significant

once coping motives are included in the model; and 2) the estimated indirect effect of social anxiety on alcohol problems through coping motives (i.e., social anxiety predicts coping motives, which in turn predict alcohol problems) should be different from zero. Lastly, we tested whether other drinking motives or alcohol consumption also acted as mediators.

As expected, results showed that social anxiety predicted greater alcohol problems ($\beta = .12$, $p = .006$, 95% CI = .03 – .22; see Figure 1). Social anxiety also predicted higher coping motives ($\beta = .37$, $p = .001$, 95% CI = .27 – .48), and higher coping motives, in turn, predicted greater alcohol problems ($\beta = .57$, $p = .002$, 95% CI = .46 – .65). Full mediation was supported: 1) the relationship between social anxiety and alcohol problems was reduced from $\beta = .12$, $p = .006$ to $\beta = -.09$, $p = .06$ (95% CI = $-.18 - .00$) once coping motives was included, and 2) the estimate of the relationship between social anxiety and alcohol problems that occurred via coping motives (i.e., the indirect effect) was significantly different than zero (.21, 95% CI = .14 – .29, $p = .001$). Finally, the other drinking motives and alcohol consumption variables were entered as additional mediators in a multiple mediator model (see Figure 2). Only enhancement motives also met criteria for a mediator. When entered individually as a mediator, the size of the indirect effect for enhancement motives (.09, 95% CI = .05– .15, $p = .001$) was lower in magnitude than the indirect effect of coping motives noted above (.21). Together, these findings suggest that coping motives mediated the relationship between social anxiety symptoms and alcohol problems, and that neither other drinking motives (except perhaps enhancement motives) nor alcohol consumption appeared to be as critical in accounting for this relationship.

Testing the Invariance of the Mediation Model Across Age Groups

Next, we tested the central question: whether the mediation by coping motives would be invariant across the three age groups. For these multi-group comparisons, we tested whether constraining particular regression paths to be equivalent across age groups would lead to significant misfit compared to estimating them freely in one or several age groups. We then entered coping motives as a mediator in order to estimate the size of the indirect effect associated with coping motives for each age group. Finally, we tested the invariance of the multiple mediator model using drinking motives and alcohol consumption as additional mediators.

For the initial regression with social anxiety predicting alcohol problems, there were meaningful age differences. Social anxiety was related to alcohol problems for emerging ($\beta = .20$, $p = .01$, 95% CI = .05 – .34), but not young ($\beta = -.08$, $p = .34$, 95% CI = $-.25 - .08$) adults. While there was no relationship between social anxiety and alcohol problems in the middle-aged group ($\beta = .16$, $p = .34$, 95% CI = $-.27 - .39$), the effect size was similar to emerging adults.

Next, we tested the age invariance of the coping motives mediation model (Figure 1), finding significant misfit ($\chi^2 = 34.21$ on $df = 6$, $p < .001$, NFI = .215) across age groups when regression paths were constrained to be equal. In follow-up models, we freed one regression path at a time, testing each possible comparison of two age groups. The misfit was due to two specific paths: 1) the relationship between coping motives and alcohol problems for emerging adults; and 2) the relationship between social anxiety and alcohol

problems for young adults once coping motives was entered as a mediator. Once these two paths were freed, the amount of misfit was no longer substantial ($\chi^2 = 5.41$ on $df = 4$, $p = .25$, $NFI = .034$).

To follow-up, we examined the misfit stemming from the path between coping motives and alcohol problems. Examining the unconstrained regression coefficients for each age group, the relationship between coping motives and alcohol problems was less strong in emerging adults ($\beta = .47$, $p = .001$, 95% CI = .32 – .62) versus young ($\beta = .74$, $p = .002$, 95% CI = .48 – .90) and middle-aged adults ($\beta = .74$, $p = .01$, 95% CI = .48 – .88). When examining the misfit stemming from the path between social anxiety and alcohol problem after coping motives was entered as a mediator, the relationship between social anxiety and alcohol problems was similar for emerging ($\beta = .02$, $p = .80$, 95% CI = $-.14$ – $.17$) and middle-aged ($\beta = $-.09$, $p = .34$, 95% CI = $-.34$ – $.07$) adults. For young adults, the original non-significant coefficient between social anxiety and alcohol problems ($\beta = $-.08$, $p = .34$) was also decreased when coping motives was included as a mediator, such that there was now a significant *negative* relationship in the mediated model ($\beta = $-.35$, $p = .001$, 95% CI = $-.50$ – $-.18$). Thus, greater social anxiety symptoms predicted fewer alcohol problems for young adults once coping motives was included as a mediator. In other words, coping motives served as a suppressor variable insofar as it enhanced the predictive validity of a different variable (in this case, the prediction by social anxiety of alcohol problems) by its inclusion in the regression equation.$$$

Next, we entered coping motives as the sole mediator in order to obtain estimates of the relationship between social anxiety and alcohol problems that was mediated via coping motives (i.e., the indirect effect). Indirect effects were similar in magnitude across age groups, and significantly different from zero for emerging (.18, 95% CI = .10 – .28, $p = .001$), young (.27, 95% CI = .10 – .45, $p = .001$), and middle-aged (.25, 95% CI = .02 – .47, $p = .04$) adults. Because confidence intervals did not include zero, this provided further evidence that coping motives either mediated (in emerging and to some extent middle-aged adults) or suppressed (in young adults) the relationship between social anxiety and alcohol problems similarly within each age group (albeit, the pattern of relationships was different across age groups). Finally, the pattern of relationships was not meaningfully altered when invariance tests were repeated using the multiple mediator model (see Figure 2). Relationships between all mediators (other than coping motives), social anxiety, and alcohol problems were invariant across age groups (see Figure 2).

Discussion

Collapsing across age groups, coping motives mediated the relationship between greater social anxiety symptoms and greater alcohol problems, replicating prior work among emerging adults (Schry & White, 2013). Neither other drinking motives nor alcohol consumption appeared to be as critical in accounting for this pattern. When examining age invariance, the pattern of mediation and magnitude of the effects were largely consistent across the emerging and middle-aged groups (although the initial anxiety/alcohol problems relationship did not reach significance in the middle-aged group). This pattern differed from the young adult group. Overall, findings for both the emerging and middle age-groups were

consistent with research from the emerging adult literature (e.g., Schry & White, 2013) and point to the relative importance of coping motives as mediators (versus other possible drinking motives) in the social anxiety–alcohol problems link. In contrast, coping motives served as a suppressor variable in the young adult group. When coping motives were included in the model, there was a significant, *negative* relationship between social anxiety and alcohol-related problems. This finding was unanticipated, but is in line with work by Eggleston, Woolaway-Bickel, and Schmidt (2004; see also Bruch et al., 1992; Bruch, Rivet, Heimberg, & Levin, 1997) that found a suppressor effect when investigating positive alcohol expectancies as a mediator between social anxiety and alcohol use. Future research is needed to evaluate if this suppressor finding replicates, and to determine what key developmental shifts occur in young adulthood that produce this unique pattern of relationships. While speculative, it is possible that socially anxious young adults are not as likely to drink in the types of high-risk situations that put emerging adults at risk for alcohol-related problems (see Buckner, Schmidt, & Eggleston, 2006). It is also possible that socially anxious young adults who do drink have become more used to the effects of alcohol (as compared to emerging adults), so they are less likely to encounter alcohol-related problems while drinking (see Buckner et al., 2006), though this leaves unclear why the positive social anxiety-alcohol problems relationship re-emerges in middle age.

Understanding how social anxiety and coping motives interact to predict either more or less alcohol-related problems depending on age is critical for theory and intervention efforts. Ultimately, interventions highlighting ways that individuals with social anxiety may inadvertently increase their risk for encountering alcohol-related problems (e.g., drinking in high risk situations, such as drinking to cope with negative affect) are likely to be valuable, particularly for socially anxious emerging and middle-aged adults.

Limitations and Conclusions

Our findings must be interpreted in light of several limitations. First, these data are cross-sectional, so cohort effects are possible. As well, the cross-sectional design is a limitation for mediation testing because it is not possible to determine the temporal relationships between social anxiety, change in coping motives, and alcohol problems. Second, given our use of a mostly female, convenience sample and self-report measures, replication is needed using other samples and multiple measurement methods. Third, our emerging adult cohort was considerably larger than the other two groups. While each age group was adequately powered to test mediation using bootstrapping (Fritz & MacKinnon, 2007), conducting invariance testing with larger samples, including adults over the age of 65 will be important. Fourth, it is possible that other substance use behaviors, not assessed here, may have influenced our findings. Finally, this study was administered via the web, which provides a less well-controlled environment than a laboratory setting. Notwithstanding, web-based data has shown strong validity and comparable findings to laboratory-based data (Buhrmester, Kwang, & Gosling, 2011; Houben & Wiers, 2008), and, on average, participants report they are more comfortable disclosing clinical information via the web than in-person (Shapiro, Chandler, & Mueller, 2013).

Together, these findings shed light on one of the fundamental questions in the comorbidity literature: under what conditions social anxiety and alcohol problems will be associated with one another, and what factors helps to account for their relationship.

Acknowledgments

This publication was supported in part by R21 AA021151 awarded to the first author, R01AA021763 and R00AA17669 awarded to the fourth author, and R01AG033033 awarded to the last author. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the NIH. Note, B. Teachman has a significant financial interest in Project Implicit, Inc., which provided services in support of this project under contract with the University of Virginia. We would like to thank Fred Smyth for his methodological assistance.

References

- Baron RM, Kenny DA. The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*. 1986; 51(6):1173–1182. [PubMed: 3806354]
- Bruch MA, Heimberg RG, Harvey C, McCann M, Mahone M, Slavkin SL. Shyness, alcohol expectancies, and alcohol use: Discovery of a suppressor effect. *Journal of Research in Personality*. 1992; 26(2):137–149.
- Bruch MA, Rivet KM, Heimberg RG, Levin MA. Shyness, alcohol expectancies, and drinking behavior: Replication and extension of a suppressor effect. *Personality and Individual Differences*. 1997; 22(2):193–200.
- Buckner JD, Schmidt NB, Eggleston AM. Social anxiety and problematic alcohol consumption: The mediating role of drinking motives and situations. *Behavior Therapy*. 2006; 37(4):381–391. [PubMed: 17071215]
- Buhrmester M, Kwang T, Gosling SD. Amazon's mechanical Turk: A new source of inexpensive, yet high-quality, data? *Perspectives on Psychological Science*. 2011; 6(1):3–5.
- Collins RL, Parks GA, Marlatt GA. Social determinants of alcohol consumption: The effects of social interaction and model status on the self-administration of alcohol. *Journal of Consulting and Clinical Psychology*. 1985; 53(2):189–200. [PubMed: 3998247]
- Cooper ML. Motivations for alcohol use among adolescents: Development and validation of a four-factor model. *Psychological Assessment*. 1994; 6(2):117–128.
- Eggleston AM, Woolaway-Bickel K, Schmidt NB. Social anxiety and alcohol use: Evaluation of the moderating and mediating effects of alcohol expectancies. *Journal of Anxiety Disorders*. 2004; 18(1):33–49. [PubMed: 14725867]
- Fehm L, Beesdo K, Jacobi F, Fiedler A. Social anxiety disorder above and below the diagnostic threshold: Prevalence, comorbidity and impairment in the general population. *Social Psychiatry and Psychiatric Epidemiology*. 2008; 43(4):257–265. [PubMed: 18084686]
- Feinn R, Tennen H, Kranzler HR. Psychometric properties of the short index of problems as a measure of recent alcohol-related problems. *Alcoholism: Clinical and Experimental Research*. 2003; 27(9):1436–1441.
- Fritz MS, MacKinnon DP. Required sample size to detect the mediated effect. *Psychological Science*. 2007; 18(3):233–239. [PubMed: 17444920]
- Ham LS, Zamboanga BL, Bacon AK, Garcia TA. Drinking motives as mediators of social anxiety and hazardous drinking among college students. *Cognitive Behaviour Therapy*. 2009; 38(3):133–145. [PubMed: 19306146]
- Houben K, Wiers RW. Measuring implicit alcohol associations via the internet: Validation of web-based implicit association tests. *Behavior Research Methods*. 2008; 40(4):1134–1143. [PubMed: 19001405]
- Kessler RC, Berglund P, Demler O, Jin R, Merikangas KR, Walters EE. Lifetime prevalence and age-of-onset distributions of dsm-iv disorders in the national comorbidity survey replication. *Archives of General Psychiatry*. 2005; 62(6):593–602. [PubMed: 15939837]

- Leary MR. A brief version of the fear of negative evaluation scale. *Personality and Social Psychology Bulletin*. 1983; 9:371–376.
- Littlefield AK, Sher KJ, Wood PK. Do changes in drinking motives mediate the relation between personality change and “maturing out” of problem drinking? *Journal of Abnormal Psychology*. 2010; 119(1):93–105. [PubMed: 20141246]
- MacKinnon DP, Lockwood CM, Hoffman JM, West SG, Sheets V. A comparison of methods to test mediation and other intervening variable effects. *Psychological Methods*. 2002; 7(1):83–104. [PubMed: 11928892]
- MacKinnon DP, Lockwood CM, Williams J. Confidence limits for the indirect effect: Distribution of the product and resampling methods. *Multivariate Behavioral Research*. 2004; 39(1):99–128. [PubMed: 20157642]
- Miller, WR.; Tonigan, JS.; Longabaugh, R. The drinker inventory of consequences (drinc): An instrument for assessing adverse consequences of alcohol abuse. Rockville, MD: NIAAA; 1995.
- Nosek BA. Moderators of the relationship between implicit and explicit evaluation. *Journal of Experimental Psychology: General*. 2005; 134:565–584. [PubMed: 16316292]
- Nosek BA, Smyth FL, Hansen JJ, Devos T, Lindner NM, Ranganath KA, Banaji MR. Pervasiveness and correlates of implicit attitudes and stereotypes. *European Review of Social Psychology*. 2007; 18:36–88.
- Rapee RM, Heimberg RG. A cognitive-behavioral model of anxiety in social phobia. *Behaviour Research and Therapy*. 1997; 35(8):741–756. [PubMed: 9256517]
- Schry AR, White SW. Understanding the relationship between social anxiety and alcohol use in college students: A meta-analysis. *Addictive Behaviors*. 2013
- Shapiro DN, Chandler J, Mueller PA. Using mechanical turk to study clinical populations. *Clinical Psychological Science*. 2013
- Shrout PE, Bolger N. Mediation in experimental and nonexperimental studies: new procedures and recommendations. *Psychological methods*. 2002; 7(4):422–445. [PubMed: 12530702]
- Sriram N, Greenwald AG. The brief implicit association test. *Experimental Psychology*. 2009; 56(4): 283–294. [PubMed: 19439401]
- Teachman BA, Gordon T. Age differences in anxious responding: Older and calmer, unless the trigger is physical. *Psychology and Aging*. 2009; 24(3):703–714. [PubMed: 19739926]
- Thomas SE, Randall CL, Carrigan MH. Drinking to cope in socially anxious individuals: A controlled study. *Alcoholism: Clinical and Experimental Research*. 2003; 27(12):1937–1943.
- Weeks JW, Heimberg RG, Fresco DM, Hart TA, Turk CL, Schneier FR, Liebowitz MR. Empirical validation and psychometric evaluation of the brief fear of negative evaluation scale in patients with social anxiety disorder. *Psychological Assessment*. 2005; 17(2):179–190. [PubMed: 16029105]

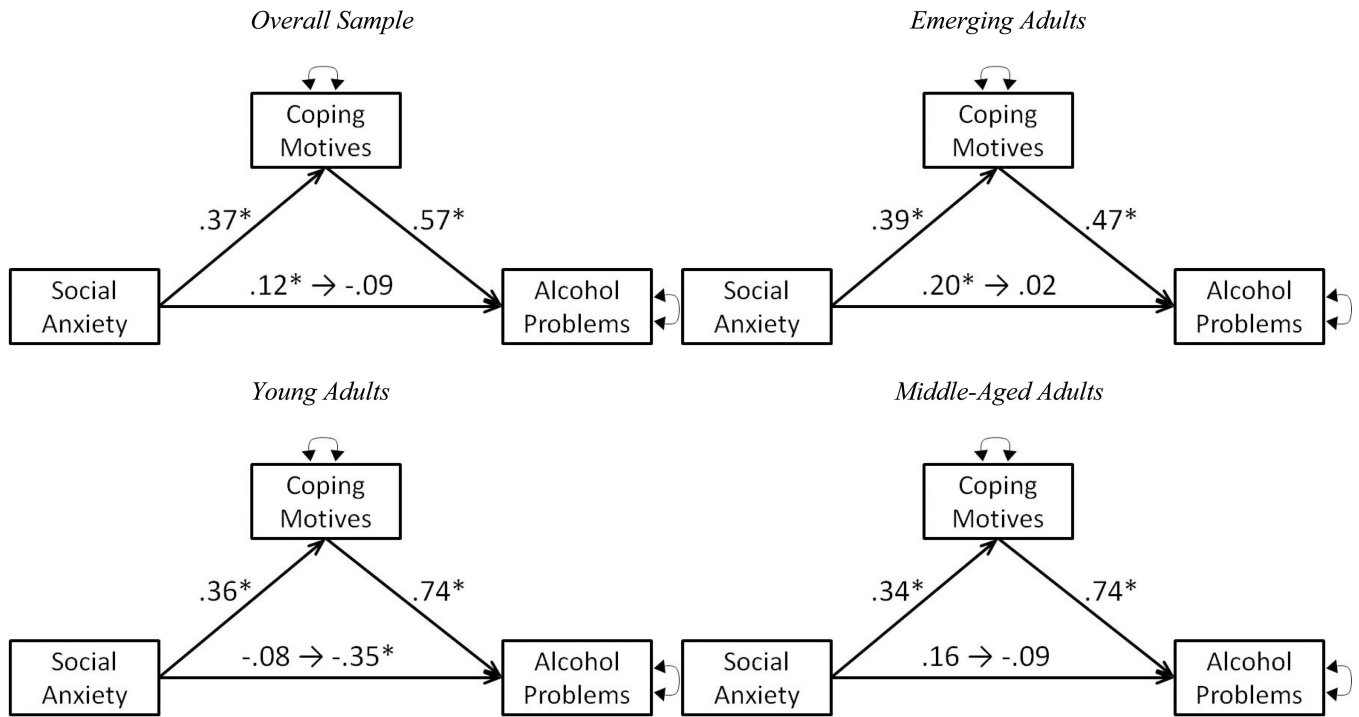
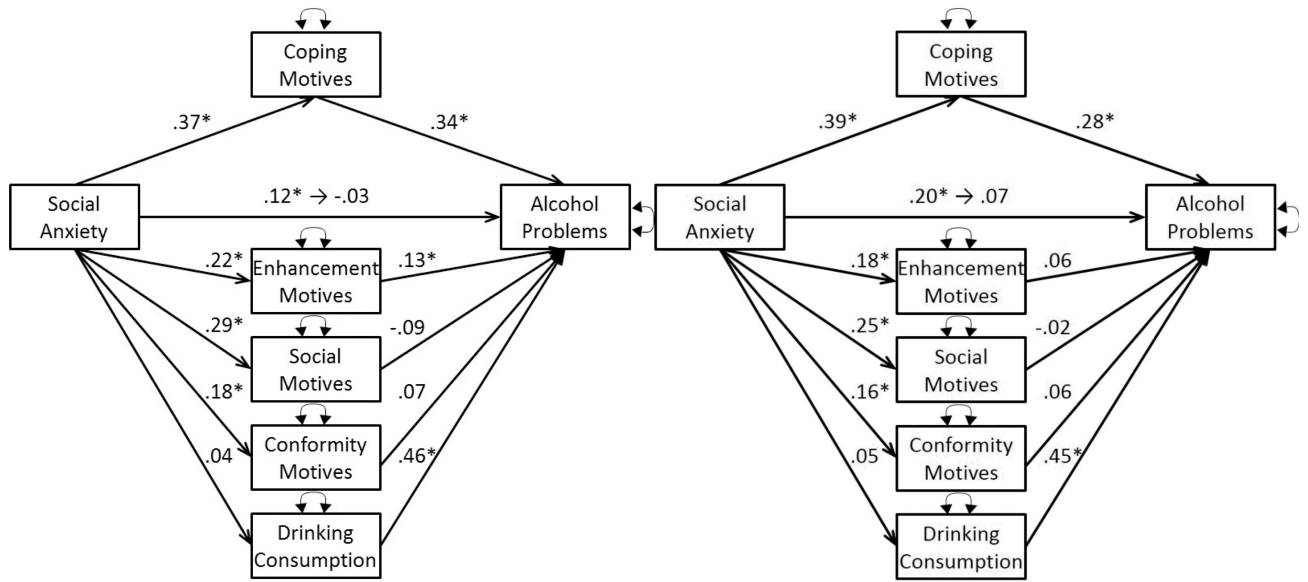


Figure 1. Testing Coping Motives as a Mediator of the Relationship between Social Anxiety and Alcohol Problems

Note: * $p < .05$. In each path diagram, the path from social anxiety to alcohol problems displays the standardized regression coefficients before and after coping motives were entered as a mediator. We initially considered gender and race (coded as Caucasian versus other) as possible covariates, but dropped these variables from our models because they did not affect the pattern of results.

Overall Sample

Emerging Adults



Young Adults

Middle-Aged Adults

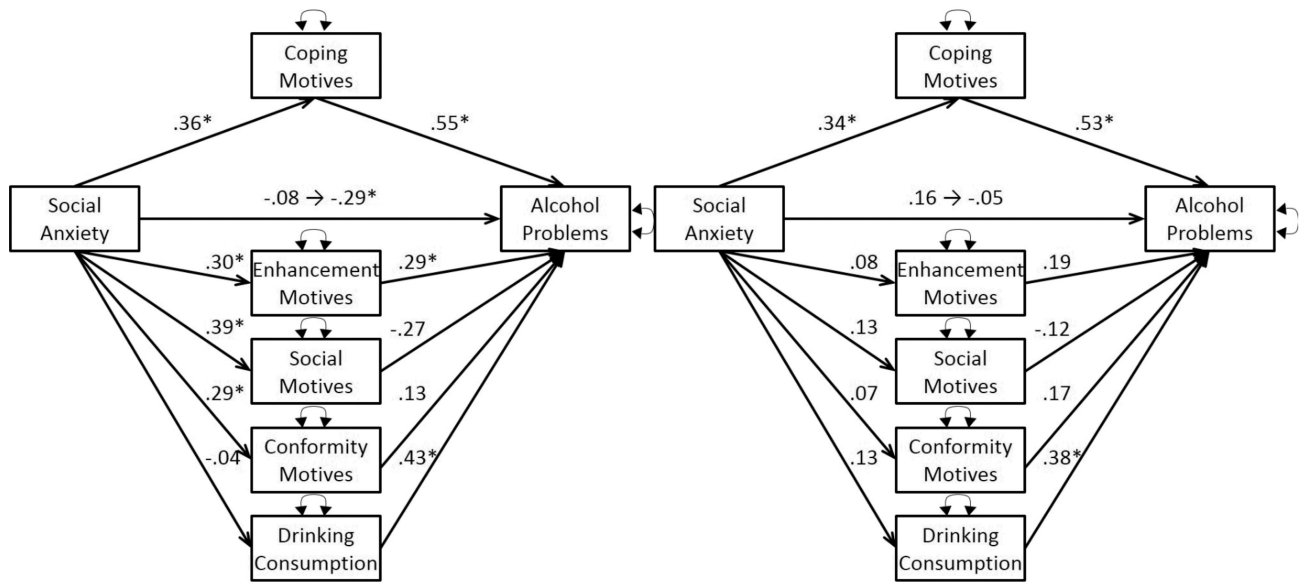


Figure 2.

A Multiple Mediator Model of the Relationship between Social Anxiety and Alcohol Problems

Note: * $p < .05$. In each path diagram, the path from social anxiety to alcohol problems displays the standardized regression coefficients before and after the multiple mediators were entered.

Table 1

Sample Characteristics

	Age Group						Full Sample	
	Emerging		Young		Middle-Aged		M or N	SD or %
Age	20.93 ^a	1.73	31.25 ^b	4.11	49.12 ^c	6.96	28.94	11.41
Gender (Female)	90	61%	44	65%	32	63%	166	62%
Race								
Caucasian	102	69%	46	68%	37	73%	185	69%
Black	23	16%	3	4%	7	14%	33	12%
Asian	4	3%	3	4%	1	2%	8	3%
American Indian/Alaska Native	2	1%	2	3%	0	0%	4	2%
More than one race	7	5%	10	15%	5	10%	22	8%
Other/unknown	8	5%	2	3%	0	0%	10	4%
Ethnicity								
Hispanic or Latino	17	12%	5	7%	2	4%	24	9%
Not Hispanic or Latino	108	73%	57	84%	42	82%	207	78%
Unknown	11	7%	3	4%	4	8%	18	6%
BFNE	33.46 ^a	10.02	33.81 ^a	10.18	29.88 ^b	8.06	32.86	9.80
DMQ Coping	9.87 ^a	4.25	7.57 ^b	2.61	7.41 ^b	3.07	8.82	3.86
DMQ Enhancement	14.20 ^a	5.15	11.41 ^b	4.57	9.53 ^c	3.99	12.60	5.15
DMQ Social	16.07 ^a	4.78	13.31 ^b	4.69	11.16 ^c	4.37	14.43	5.06
DMQ Conformity	7.04 ^a	2.75	6.18 ^{ab}	1.59	5.98 ^b	1.86	6.62	2.39
SIP	4.15 ^a	4.92	3.10 ^b	5.70	2.61 ^b	5.34	3.59	5.23
Drinking Frequency	5.01 ^a	1.93	5.12 ^a	2.48	6.16 ^b	2.78	5.26	2.29
Drinking Quantity	4.68 ^a	3.33	2.93 ^b	2.13	2.55 ^c	3.53	3.83	3.24

Note: Age differences are noted by unique letter superscripts (i.e., 'a' versus 'b') and are all significant at $p < .05$. BFNE is the Brief Fear of Negative Evaluation; DMQ Coping, Enhancement, Social, and Conformity subscales refer to the subscales of the Drinking Motives Questionnaire; SIP is the Short Inventory of Problems. Means reflect the total score for each questionnaire (i.e., BFNE, DMQ-Coping, SIP). Percentages for race and ethnicity may not add up to 100% due to rounding. For demographic data, five participants did not report race (two emerging adults, two young adults, and one middle-aged adult), 18 participants did not report ethnicity (12 emerging adults, three young adults, and three middle-aged adults), and one participant did not report gender; this missing data is not reflected in the table. The Drinking Frequency variable (assessed with the DDQ) reflects frequency of alcohol consumption during the previous month. Responses were grouped into the following categories: 0 (never), 1 (less

than once a month), 2 (once a month), 3 (two times a month), 4 (three times a month), 5 (once a week), 6 (two times a week), 7 (three times a week), 8 (four times a week), 9 (five times a week), 10 (six times a week), 11 (every day). The Drinking Quantity variable (assessed with the DDO) reflects how many drinks on average participants consumed when they consumed alcohol during the past month. Responses indicate number of drinks (e.g., 0 = 0 drinks; 1 = 1 drink; etc., up to 25, which was equivalent to 25+ drinks). Due to skew, Kruskal-Wallis tests with follow-up Mann-Whitney U tests were used in place of one-way ANOVAs with follow-up Least Significant Difference tests for Coping motives, Enhancement motives, Conformity motives, the Short Inventory of Problems, and the Drinking Frequency and Quantity variables.