

Social Anxiety and Positive Outcome Expectancies on Risk-Taking Behaviors

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Abstract We examined the hypothesis that under specific conditions, socially anxious individuals may be risk-prone as opposed to risk-averse in domains such as heavy drinking, illicit drug use, unsafe sexual practices, and aggression. A college-aged sample, predominantly women, completed a series of questionnaires on social anxiety and risk-taking behavioral intentions. Results of hierarchical regression analyses indicated that positive outcome expectancies moderated relationships between social anxiety and sexual risk-taking and aggression. Socially anxious individuals expecting desirable outcomes reported the greatest risk-taking behavioral intentions. Socially anxious individuals expecting less desirable outcomes reported the least risk-taking intentions. Social anxiety interaction effects were not accounted for by other anxiety and depressive symptoms. Data suggested that social anxiety was also positively related to illicit drug use. Although preliminary, these significant findings suggest that a subset of socially anxious individuals may engage in risky activities that likely serve the purpose of regulating emotions.

Keywords Social anxiety · Risk taking · Outcome expectancies · Unsafe sex · Aggression

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People engage in risk-taking behaviors such as alcohol use as a strategy to regulate (improve) their mood (Cooper, Frone, Russell, & Mudar, 1995). The motivation to reduce distress may cause individuals prone to anxiety problems, particularly those with excessive social anxiety, to be vulnerable to the abuse of alcohol (Burke & Stephens, 1999; Kushner, Abrams, & Borchardt, 2000) and illicit drugs (Brown, Campbell, Lehman, Grisham, & Mancill, 2001). While a number of studies have explored the relationship between social anxiety and substance use, few have examined relationships with other emotion regulating, risky behaviors such as unsafe sexual practices and aggression. Like alcohol and drug use, these risky behaviors may compensate for some of the emotional and behavioral dysregulation experienced by socially anxious individuals. Freely choosing to engage in risky behaviors may temporarily restore a sense of control over external events and their emotional impact, and reduce an over-reliance on avoidance behaviors in response to threat and danger. We sought to further examine whether social anxiety is associated with behavioral intentions for four risk-taking behaviors (i.e., heavy drinking, illicit drug use, unsafe sexual practices, aggression), including the possible moderating effects of positive outcome expectancies.

Social Anxiety and Substance Use

Although limited to alcohol use, data with nonclinical college student samples provide evidence of less than straightforward relationships between social anxiety and substance use. Social anxiety has been related to increased alcohol use (Kidorf & Lang, 1999), decreased alcohol use (e.g., Bruch et al., 1992; Eggleston, Woolaway-Bickel, & Schmidt, 2004), and in some cases, no relationships were found (Ham & Hope, 2005; Tran, Haaga, & Chambless, 1997). Differential findings may be a function of different methodologies (e.g., behavioral vs. self-report measures of alcohol consumption). Negative relationships between social anxiety and alcohol use may be due to the small social network of socially anxious individuals. For example, the most common contexts for alcohol consumption on college campuses are social settings such as bars and parties. Social fears and avoidance behaviors lead to less social activity and thus may provide fewer opportunities to consume alcohol with others.

Positive beliefs about the effects of alcohol and drugs (i.e., positive expectancies) may provide an explanation for why some socially anxious individuals engage in risk-taking behaviors. Socially anxious individuals with positive outcome expectancies believe that using alcohol or other drugs will alleviate social anxiety symptoms and increase social assertiveness. Additionally, beliefs that anxiety symptoms can be better managed are expected to enhance one's perceived sense of control over negative social outcomes (e.g., the likelihood of rejection), thereby leading those with stronger beliefs about the positive effects of substance use to consume greater quantities than those with weaker beliefs. Nonetheless, available data are mixed; some studies provide support for the moderating influence of positive expectancies on relationships between social anxiety and alcohol use (e.g., Kidorf & Lang, 1999; Tran et al., 1997), and others fail to find effects (e.g., Eggleston et al., 2004; Ham & Hope, 2005). Different samples and methodologies may account for some of these inconsistencies. In addition, there is an absence of data on the interactive effects of outcome expectancies and social anxiety on alcohol abuse, illicit drug use and abuse, and other risk-taking behaviors such as aggression and unsafe sexual practices.

Social Anxiety and Aggression

Aggressive behavior is another domain of emotion regulation and risk-taking that may be relevant to social anxiety. The prototypical "fight-or-flight" response for socially anxious individuals

is “flight” or avoidance. However, depending on the context, some individuals may in fact “fight” or behave aggressively. Recent data suggest that social anxiety is positively related to anger management problems, including angry reactions to criticism and rejection, and attempts to suppress these reactions (Ayduk, Downey, Testa, Yen, & Shoda, 1999; Erwin, Heimberg, Schneier, & Liebowitz, 2003). Attempts to suppress emotions such as anger are an ineffective regulation strategy, only serving to intensify the exact emotions one is attempting to avoid or inhibit (Gross & Levenson, 1993). By definition, socially anxious individuals are hypersensitive to perceived rejection, and thus, have frequent opportunities to experience anger and attempt to control it. Social anxiety exhibits a near-zero relationship with the external expression of anger (Erwin et al., 2003). However, there are no published data on whether this relationship is moderated by beliefs that positive outcomes will derive from aggressive behavior. One strategy for socially anxious individuals to cope with hypervigilant concerns about being rejected and scrutinized is to reject other people before they are rejected by them. That is, if socially anxious individuals believe aggressive behavior will benefit them (e.g., curtailing the likelihood of being rejected), they may be more likely to attempt to regulate their social environment by being aggressive.

Social Anxiety and Sexual Activity

In addition to anger, the interpersonal impairment of socially anxious individuals has been extended to sexual functioning (Bodinger et al., 2002). This includes less sexual enjoyment, less frequent orgasms, and poorer sexual performance. The interpersonal fears, assertiveness difficulties, and relationship difficulties of socially anxious individuals can only compound problems by decreasing opportunities for sexual activity. Large discrepancies between desired and actual sexual activity may cause socially anxious individuals to be more willing to pursue risky sexual opportunities without prudent judgment. Social skill impairments (e.g., assertiveness difficulties; Kachin, Newman, & Pincus, 2001) can also be expected to increase their difficulty in negotiating safe sex situations.

The Present Study

We sought to extend prior work on social anxiety and risk-taking behavioral intentions by examining the relationship between social anxiety and risk-taking for heavy drinking, illicit drug use, unsafe sexual practices, and aggression. Due to inconsistencies in the literature on social anxiety and substance use, we had no ad hoc hypotheses on relationships between social anxiety and behavioral intentions for heavy drinking and illicit drug use. We hypothesized that socially anxious individuals with positive outcome expectancies would report greater intentions to engage in aggressive behavior compared to nonanxious individuals. Timidity and submissiveness are prototypical behavioral markers of social anxiety. Thus, socially anxious individuals with less positive outcome expectancies were expected to report the least intentions for aggression. We hypothesized that in the presence of positive outcome expectancies, socially anxious individuals would report greater behavioral intentions for unsafe sexual practices than their peers; overriding their prototypical risk aversive tendencies. Socially anxious individuals reporting less positive outcome expectancies were expected to report the least intentions for unsafe sexual practices. As an additional contribution, we examined whether social anxiety effects were independent of other anxiety and depressive symptoms.

Method

Participants

Participants included 84 undergraduate students¹ (64 women, 18 men, and 2 not reporting their sex). Of this sample, 61 (73%) described themselves as European American, five (6%) as Asian American, four (5%) as African American, four (5%) as Hispanic American, and 10 (12%) endorsing other categories (e.g., Middle Eastern). The mean age was 24.35 years ($SD = 7.18$, ranging from 18 to 49). Students were obtained from two separate night classes, which are typically comprised of older students than those in daytime undergraduate classes. Participants received class credit for completing the following questionnaires.

Measures

Social Interaction Anxiety Scale (SIAS). The 19-item SIAS (Mattick & Clarke, 1998) assessed anxiety and avoidance in social interaction situations (e.g., difficulty initiating and maintaining conversations, tense interacting with co-workers or in groups). Several studies have found the SIAS to have excellent psychometric properties including internal consistency, test–retest reliability, and sensitivity (.86) and specificity (.70) for detecting SAD diagnoses (Brown et al., 1997). Respondents used a five-point Likert-type scale (“Not at all” to “Extremely”).

Cognitive Appraisal of Risky Events Questionnaire (CARE). The 90-item CARE (Fromme, Katz, & Rivet, 1997) assessed beliefs about the potential benefits, consequences, and behavioral intentions for 30 risky behaviors. We chose the CARE for several reasons including: (1) coverage of several domains of risk-taking behaviors “with relatively immediate potential consequences” (p. 24), (2) items with relevance to young adults (and not merely adolescents or older adults), and (3) a general assessment strategy that allows individuals to derive and rate personally meaningful outcome expectancies (as opposed to the nonrandom error of having individuals evaluate specific negative and positive consequences), and (4) well-established psychometric properties (see Stacy, Widaman, & Marlatt, 1990 for methodological issues in this area). The six dimensions of risky behaviors include: (1) Heavy Drinking (3 items; e.g., consuming at least five drinks on an occasion, drinking alcohol too quickly), (2) Illicit Drug Use (3 items; e.g., smoking marijuana, mixing drugs and alcohol), (3) Risky Sexual Activities (6 items; e.g., sex without protection, sex with multiple partners), (4) Aggressive and Illegal Behaviors (9 items; e.g., punching someone with a fist, getting into a fight or argument), (5) High Risk Sports (4 items; e.g., rock or mountain climbing), and (6) Academic/Work Behaviors (5 items; e.g., missing class or work). We did not include high risk sports and academic/work behaviors in our analyses because of an absence of theoretical or practical interest. For each of these 30 risky activities, participants used a seven-point Likert Scale (“Not at all likely” to “Extremely likely”) to rate the expectancy that they would experience risks (negative consequences) and benefits (positive consequences). Using this same scale, participants rated the likelihood of engaging in each of these activities over the course of the next 6 months. Each of the CARE subscales has been shown to have acceptable psychometric

¹ A portion of these data was used in another study (Kashdan, 2004). However, the hypotheses and findings in the current study have not been previously reported. The current sample size was slightly smaller than prior work, as we focused on participants completing the Cognitive Appraisal of Risky Events Questionnaire.

properties (Fromme et al., 1997; Katz, Fromme, & D’Amico, 2000). Of note, scales related to perceived risks were not used in the current study.

Mood and Anxiety Symptom Questionnaire (MASQ). The 90-item MASQ (Watson & Clark, 1991) is a multi-dimensional measure to assess major components of anxiety and mood disorders (e.g., Watson et al., 1995). The 17-item Anxious Arousal subscale assesses somatic symptoms of anxiety (e.g., physiological hyperarousal). The 22-item Anhedonia subscale assesses loss of interest in previously enjoyable activities and diminished positive affect. For all items, respondents used a five-point Likert-type scale (“Not at all” to “Extremely”). The 12-item Nonspecific Depression and 11-item Nonspecific Anxiety subscales were not used in the current study.

Results

Preliminary Analyses

Psychometric data and the relationships between all scales are reported in Table I. All scales and subscales had acceptable internal consistency. Participants’ average scores on the SIAS ($M = 28.10$; $SD = 14.84$) were similar to nonclinical samples in prior, published work (Heimberg et al., 1992; Mattick & Clarke, 1998). As shown in Table I, social anxiety was not significantly related to risk-taking behavioral intentions and cognitions.

Table I Psychometric Properties and Relationship Between Individual Difference Variables

Variable	<i>M</i>	<i>SD</i>	α	<i>r</i> with SIAS	<i>pr</i> with SIAS ^a
SIAS	28.10	14.84	.93		
CARE—Heavy drinking					
Benefit	7.22	4.55	.86	.03	.02
Behavioral intentions	8.42	5.25	.81	.16	.13
CARE—Illicit drug use					
Benefit	6.16	4.19	.75	−.05	−.03
Behavioral intentions	5.79	4.59	.72	.14	.20
CARE—Risky sexual activities					
Benefit	10.51	6.37	.85	.09	.06
Behavioral intentions	9.13	5.59	.77	.03	−.03
CARE—Aggression					
Benefit	14.86	7.72	.87	.05	.01
Behavioral intentions	14.18	6.99	.82	.08	−.01
MASQ-anxious arousal	26.53	8.21	.84	.25*	.19
MASQ-anhedonia	58.59	8.71	.92	.20	.19

Notes. $n = 84$. * $p < .05$. ** $p < .01$. *** $p < .005$. All p -values were two-tailed. SIAS: Social Interaction Anxiety Scale (Mattick & Clarke, 1998); CARE: Cognitive Appraisal of Risky Events Questionnaire (Fromme, Katz, & Rivet, 1997); MASQ: Mood and Anxiety Symptom Questionnaire (Watson & Clark, 1991).

^aPartial correlations statistically controlling for age.

Examining Social Anxiety Effects on Risk-Taking Behavioral Intentions

We conducted a series of hierarchical regression analyses to examine the moderating influence of positive outcome expectancies on relationships between social anxiety and risk-taking behavioral intentions for heavy drinking, illicit drug use, aggression, and unsafe sexual practices. As mentioned, our sample of college students had a large age distribution. Age had a significant negative relationship with measures of social anxiety and anxious arousal ($ps < .05$; see Kashdan, 2004 for details). Therefore, age was entered as a covariate in the first step. Social anxiety and expected benefits were entered in the second step. Social Anxiety \times Expected Benefits interactions were entered in the final step. For interaction terms, predictor variables were centered to minimize multicollinearity (Aiken & West, 1991).

For heavy drinking, illicit drug use, aggression, and unsafe sexual practices, greater expected benefits predicted greater risk-taking behavioral intentions ($ps < .001$). As shown in Table II, Social Anxiety \times Expected Benefits interaction effects were found for behavioral intentions for aggression, $F\Delta(1, 79) = 16.72$, $R^2\Delta = .08$, $p < .001$, Effect Size $r = .42$, and unsafe sexual practices, $F\Delta(1, 77) = 3.88$, $R^2\Delta = .04$, $p = .05$, Effect Size $r = .22$. These interactions were decomposed (see Aiken & West, 1991) and the results indicated similar patterns. Because the predictors were transformed into z scores, one unit is equivalent to one standard deviation. For aggression, the simple slopes for high and low socially anxious individuals were 6.42 and 2.04, respectively (see Fig. 1), for unsafe sexual practices, the simple slopes for high and low socially anxious individuals were 3.82 and 1.22, respectively (see Fig. 2). As predicted, for high socially anxious individuals, each unit increase in expected benefits was associated with a 6.42 increase in the intended frequency of aggressive behaviors and a 3.82 increase in the intended frequency of unsafe sexual practices over the next 6 months. In contrast, for low socially anxious individuals, each unit increase in expected benefits was associated with a 2.04 increase in the intended frequency of aggressive behaviors and a 1.22 increase in the intended frequency of unsafe sexual practices over the next 6 months. Thus, high socially anxious individuals expecting

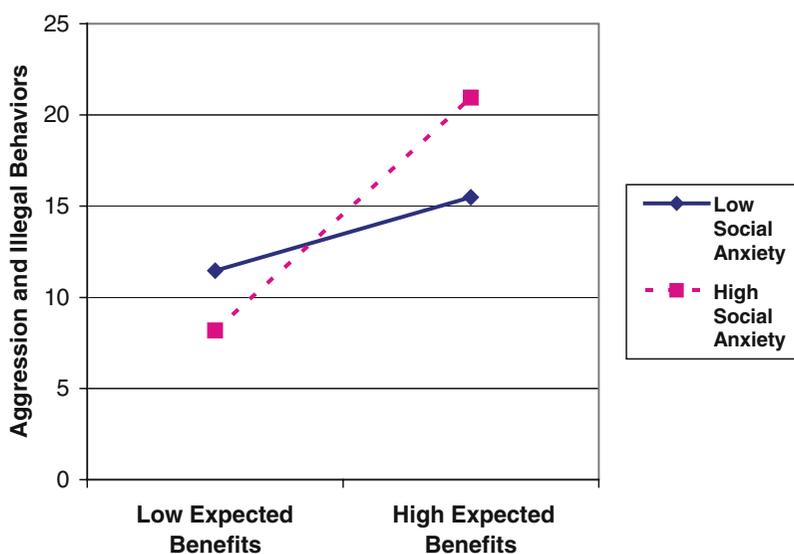


Fig. 1 Simple slopes representing the social anxiety \times Expected benefits interaction on behavioral intentions for aggressive behaviors over the next 6 months.

Table II Hierarchical Regression Results for Behavioral Intentions for Heavy Drinking, Illicit Drug Use, Aggression, and Risky Sexual Activities

	Heavy drinking			Illicit drug use			Risky sexual activities			Aggression		
	β	<i>T</i>	$R^2\Delta$	β	<i>t</i>	$R^2\Delta$	β	<i>t</i>	$R^2\Delta$	β	<i>t</i>	$R^2\Delta$
Step 1—Covariate			.07*			.00			.00			.01
Age	-.27	-2.49*		-.03	-.24		-.05	-.42		-.11	-1.00	
Step 2—Main effects			.39***			.40***			.25***			.56***
SIAS	.11	1.30		.19	2.08*		-.01	-.08		.05	.62	
Benefits	.65	7.40***		.61	7.07***		.51	5.08***		.76	10.19***	
Step 3—Interaction			.01			.00			.04+			.08***
SIAS × benefits	.10	1.24		.02	.22		.20	1.97+		.31	4.09***	
Total R^2			.47***			.40***			.29***			.65***

Notes: *ns* = 83. (81 for risky sexual activities); due to missing data, SIAS: Social Interaction Anxiety Scale (Mattick & Clarke, 1998).

+*p* = .05, **p* < .05***p* < .01 ****p* < .001.

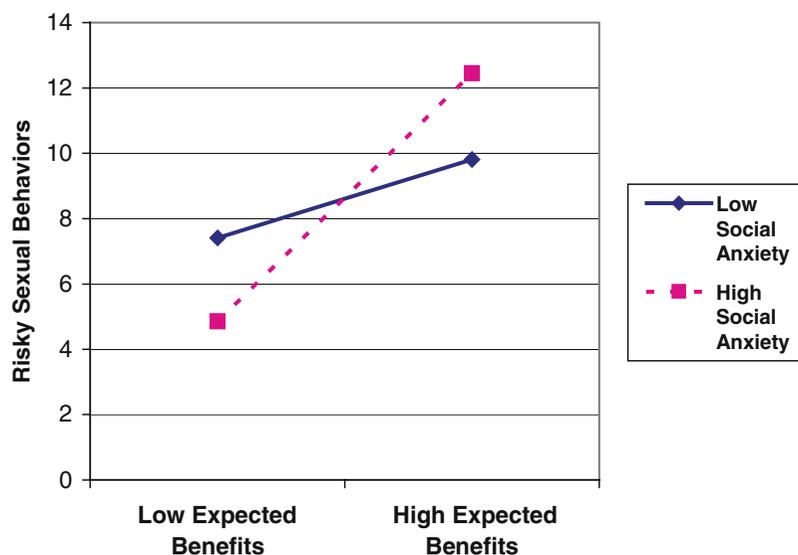


Fig. 2 Simple slopes representing the social anxiety \times Expected benefits interaction on behavioral intentions for unsafe sexual practices over the next 6 months. *Notes.* Simple slopes were plotted at one standard deviation above and below the mean for social anxiety and expected benefits. We used z scores for social anxiety and expected benefits

desirable outcomes reported the greatest behavioral intentions for aggression and unsafe sexual practices whereas high socially anxious individuals expecting less desirable outcomes reported the least behavioral intentions.

Additionally, after controlling for age and expected benefits, social anxiety was positively related to intended illicit drug use, $t(80) = 2.08$, $p = .04$, Effect Size $r = .23$.

Specificity of Social Anxiety Effects

The specificity of social anxiety effects were examined by repeating the foregoing analyses controlling for several subscales of the Mood and Anxiety Symptom Questionnaire. In each hierarchical regression model, age was entered in the first step. MASQ-Anxious Arousal (specific anxiety symptoms) and MASQ-Anhedonia (specific depressive symptoms) were entered in the second step. Social anxiety and expected benefits were entered in the third step. When relevant, Social Anxiety \times Expected Benefits interactions were entered in the fourth step. This order of entry allowed us to examine the incremental variance in behavioral intentions attributable to social anxiety.

Anxious arousal and anhedonia accounted for 12 and 17% of the variance in intended aggression and unsafe sexual practices, respectively. Controlling for these symptoms had no influence on the Social Anxiety \times Expected Benefits interaction effect for aggression, $F\Delta(1, 76) = 27.08$, $R^2\Delta = .11$, $p < 0.001$, Effect Size $r = 0.51$ (Effect Size r increase of 0.09), and a minimal effect for unsafe sexual practices, $F\Delta(1, 74) = 3.21$, $R^2\Delta = 0.03$, $p = 0.08$, Effect Size $r = 0.20$ (Effect Size r reduction of 0.02). Anxious arousal and anhedonia accounted for 11% of the variance in illicit drug use, reducing the relationship between social anxiety and illicit drug use to nonsignificance ($p = 0.27$).

Discussion

We conducted the first examination of social anxiety relationships with behavioral intentions for heavy drinking, illicit drug use, aggression, and unsafe sexual practices. Positive expectancies moderated social anxiety relationships with both intended unsafe sexual practices and aggression. Specifically, socially anxious individuals expecting desirable outcomes reported the greatest intended frequency of risky behaviors whereas socially anxious individuals expecting less desirable outcomes reported the least behavioral intentions. Social anxiety interaction effects were not accounted for by other anxiety and depressive symptoms. There also was evidence that social anxiety was positively related to behavioral intentions for illicit drug use. Consistent with the most recent studies on the topic (Eggleston et al., 2004; Ham & Hope, 2005), we found no relationship between social anxiety and intended heavy drinking, and positive expectancies failed to moderate this effect.

We found support for the moderating influence of positive expectancies on relationships between social anxiety and behavioral intentions for unsafe sexual practices and aggression. This interaction accounted for an acceptable degree of incremental variance for aggression and unsafe sexual practices (8 and 4%, respectively). One interpretation as to why effects were only found for aggression and unsafe sexual practices is that these two domains of risky behaviors are interpersonally based. Fear has a distinct effect on risk preferences, increasing risk-aversion (Lerner & Keltner, 2001), and individuals with excessive social fears tend to be the most risk-averse in social contexts. Individuals who are excessively socially anxious can be described as being in prevention mode with the pain and punishment associated with negative evaluation and rejection being more salient and influential than the pleasures associated with positive relations with others or personal growth opportunities. This could account for the extremely low intentions for aggressive and unsafe sexual behaviors reported by socially anxious individuals with *weak* positive expectancies. The rewards of responding to transgressors or enjoying risky sexual activities pale in comparison to imagined negative social consequences. The change to risk-taking intentions for socially anxious individuals with *strong* positive expectancies may be a function of an elevated sense of control over external events. Positive expectancies may trigger the desire to gain control over the social environment that causes them undesirable levels of anxiety and inhibition. If one's dominant behavior patterns (e.g., timidity, avoidance) tend to cause psychological pain, one method to gain a sense of control and regulate emotions is to radically alter these behavior patterns. Thus, socially anxious individuals with positive outcome expectancies may behave aggressively and take sexual risks to obtain infrequent social rewards while additionally distracting themselves from their chronic, hyper-focused attention to looming danger.

With an absence of data on social anxiety and risky sexual and aggressive behaviors, we can only speculate on the possible causal mechanisms for these relationships. Plausible mechanisms include self-presentation concerns and beliefs that existing relationships will be devalued by others as a result of one's actions (Leary, 2001). For college students, risk-taking or dangerous behaviors may be perceived as a means of enhancing one's social status. In hopes of gaining approval, excessively socially anxious individuals with high positive expectancies may act against their dominant unassertive tendencies. Risky sexual activities, illicit drug use, and aggressive behavior may facilitate social engagement and acceptance (at least, in the short-term). Accepting invitations to join others in risky sexual or drug activities, or deciding to fight when challenged to a physical altercation (or damaging property) in front of an audience, may be perceived as routes to being accepted (and be considered "cool" by peers). With fears of rejection being the definitive concern of socially anxious individuals, these perceived benefits could explain why these behaviors are more reinforcing to socially anxious individuals with high positive expectancies

compared to nonanxious individuals. Additionally, poor assertiveness skills in socially anxious individuals with high positive expectancies could lead to more excessive and impulsive behaviors in response to anger-provoking and sexually pressuring situations. Despite the appeal of these formulations, further empirical data are needed. In particular, there is a paucity of research on the contextual factors that lead socially anxious individuals to respond to distress with “fight” as opposed to “flight” responses.

As an avenue of future research, we believe social rank theory (Gilbert, 2001) can provide insight into why only a subset of socially anxious individuals develop positive expectancies for risky behaviors. Individuals naturally compete for limited access to social, physical, and intellectual resources in their social group. Those with “superior” social rank gain the greatest access and “inferior” members can be one misstep away from being excluded from the group and losing access to all resources. Using this framework, socially anxious individuals with high positive expectancies, who are hypersensitive to their social position and possible ostracism, may perceive behaviors such as aggression or risky sexual activities as being representative of individuals with superior social rank. A perception that often is reinforced by media portrayals of social “superiors.” These values can derive from social learning principles such as (1) discovering that “superior” social rank models are reinforced for risky behaviors and thus, modeling them, and (2) engaging in “trial-and-error” attempts at gaining more social reinforcement than punishment or neglect. Whether socially anxious individuals with high positive expectancies use risky behaviors as a strategy to enhance their own social rank and gain access to social resources (e.g., intimacy, social support, protection) will theoretically be affected by whether they view themselves as “inferior” in social rank compared to sexual partners and their own history of reinforcement patterns for risky behaviors.

We failed to find effects for the moderating influence of positive expectancies on social anxiety associations with intended heavy drinking or illicit drug use. Although social anxiety and expected benefits were independently associated with greater behavioral intentions for illicit drug use, social anxiety main effects were nonspecific (i.e., diminishing after controlling for anxious arousal and anhedonia). These findings may be a function of our measurement strategy and sample. The items on the CARE focus on drug use, and not abuse, with only one item explicitly moving beyond marijuana. Because the average college student in our sample reported benefits associated with illicit drug use, it appears that marijuana use and mixing drugs with alcohol (two of the three scale items) are not outside the perceived social norm (e.g., Johnston, O’Malley, Bachman, & Schulenberg, 2004; Page & Scanlan, 1999). A similar social norm was found for heavy drinking with evidence of a strong positive relationship between expected benefits and intended heavy drinking. As normative behaviors in college students, perhaps it is not surprising that social anxiety had a small positive relationship with illicit drug use, as well as a small, albeit nonsignificant, relationship with heavy drinking. The failure to find a more substantial positive relationship between social anxiety and our measure of alcohol consumption may be a function of the CARE measuring heavy drinking as opposed to alcohol abuse or problems. Fitting with the self-presentation model, social anxiety may be positively related to these risky behaviors because they are considered socially desirable and “cool” to their peers.

Although preliminary, our findings suggest that a subgroup of socially anxious individuals is at risk for engaging in potentially dangerous activity. Given the high prevalence of unprotected sex, sexually transmitted diseases, pregnancies, and violence in young adults (Centers for Disease Control and Prevention, 2004), there is merit in continuing to explore the potential interactive risk of social anxiety and positive expectancies on unsafe sexual practices and aggression. If our initial findings replicate, targeted prevention and intervention efforts should be considered. Strategies to be implemented could include: (1) social competency—evaluating and enhancing core values,

decision-making, problem-solving, and communication skills to reduce the likelihood of risky behaviors, (2) social norms—providing corrective information on what risky behaviors others are actually doing compared to perceptions, (3) contextual awareness—increasing coping skills in relation to where risky behaviors tend to occur and individuals' underlying motives and self-regulatory techniques (e.g., experiential avoidance, facilitate pleasure and sociability). These risk and protection strategies may work in combination with traditional cognitive-behavioral techniques to reduce social anxiety.

We extended recent work suggesting relationships between anger and social anxiety (Erwin et al., 2003). Although social anxiety has not shown relationships to outward expressions of anger, our inclusion of cognitive appraisals elucidated a specific condition in which social anxiety may in fact be related to aggressive behavior.

The most obvious line of future inquiry is to prospectively evaluate relationships between social anxiety and risky behavior. Experience-sampling methodologies can vastly enhance the reliability of data collection. With the use of daily diaries and cellular phones, the frequency, antecedents, and consequences of risky behaviors can be collected unobtrusively in each participant's natural environment (Collins, Kashdan, & Gollnisch, 2003). With these methodologies, the temporal sequence of risky behaviors and changes in social anxiety and expectancy beliefs can be determined. It will be interesting to examine whether risky behaviors serve to effectively regulate emotions in the short- and long-term. Additionally, experimental studies are needed to examine the impact of manipulating social anxiety and expectancy beliefs on risk preferences. Positive relationships between excessive social anxiety and substance use/abuse have been much more consistent in clinical compared to nonclinical samples. Thus, there is reason to use both clinical and nonclinical samples in replications with more sophisticated methodologies.

This study was not without limitations. Our sample was predominantly women therefore our results may not generalize to men. Although we did not find gender differences on any measures or relationships under study, social anxiety tends to be greater in women compared to men (Rapee, 1995) and risk-taking behavior tends to be greater in men (e.g., Staton et al., 1999). Thus, future studies should attend to gender issues. We only included college students, and on average, our sample was slightly older than prototypical students. This may limit the generalizability of findings to other populations. However, college aged students are greater risk takers than older cohorts and may be the most suitable for examining relationships between social anxiety and risk-taking. The small size of our sample led to elevated Type II error rates. This is particularly relevant to our tests of specificity. Statistically controlling for depressive and anxious arousal symptoms was a conservative test of the uniqueness of social anxiety effects. Effect sizes were consistently reported to account for the limitations of significance tests. Our reliance on cross-sectional, self-report data raises some questions concerning the validity of our findings. However, the CARE, our main dependent variable, has predictive validity in predicting actual, prospective risky behaviors (Katz et al., 2000). The causal effects of social anxiety and expectancies on behavioral intentions could not be tested with the current design. Despite these limitations, our study serves as a useful initial examination of the relationships between social anxiety and a broad range of risky behavioral intentions.

References

- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. London: Sage.
- Ayduk, O., Downey, G., Testa, A., Yen, Y., & Shoda, Y. (1999). Does rejection elicit hostility in rejection sensitive women?. *Social Cognition, 17*, 245–271.

- Bodinger, L., Hermesh, H., Aizenberg, D., Valevski, A., Marom, S., Shiloh, R., et al. (2002). Sexual function and behavior in social phobia. *American Journal of Psychiatry*, *63*, 874–879.
- Brown, E. J., Turovsky, J., Heimberg, R. G., Juster, H. R., Brown, T. A., & Barlow, D. H. (1997). Validation of the Social Interaction Anxiety Scale and the Social Phobia Scale across the anxiety disorders. *Psychological Assessment*, *9*, 21–27.
- Brown, T. A., Campbell, L. A., Lehman, C. L., Grisham, J. R., & Mancill, R. B. (2001). Current and lifetime comorbidity of the DSM-IV anxiety and mood disorders in a large clinical sample. *Journal of Abnormal Psychology*, *110*, 585–599.
- Bruch, M. A., Heimberg, R. G., Harvey, C., McCann, M., Mahone, M., & Slavkin, S. L. (1992). Shyness, alcohol expectancies, and alcohol use: Discovery of a suppressor effect. *Journal of Research in Personality*, *26*, 137–149.
- Burke, R. S., & Stephens, R. S. (1999). Social anxiety and drinking in college students: A social cognitive theory analysis. *Clinical Psychology Review*, *19*, 513–530.
- Centers for Disease Control and Prevention (2004). Youth risk behavior surveillance—United States, 2003. *Morbidity and Mortality Weekly Report*, *53*, SS-2.
- Collins, R. L., Kashdan, T. B., & Gollnisch, G. (2003). The feasibility of using cellular phones to collect ecological momentary assessment data: Application to alcohol consumption. *Experimental and Clinical Psychopharmacology*, *11*, 73–78.
- Cooper, M. L., Frone, M. R., Russell, M., & Mudar, P. (1995). Drinking to regulate positive and negative emotions: A motivational model of alcohol use. *Journal of Personality and Social Psychology*, *69*, 990–1005.
- Eggleston, A. M., Woolaway-Bickel, K., & Schmidt, N. B. (2004). Social anxiety and alcohol use: Evaluation of the moderating and mediating effects of alcohol expectancies. *Journal of Anxiety Disorders*, *18*, 33–49.
- Erwin, B. A., Heimberg, R. G., Schneier, F. R., & Liebowitz, M. R. (2003). Anger experience and expression in social anxiety disorder: Pretreatment profile and predictions of attrition and response to cognitive-behavioral treatment. *Behavior Therapy*, *34*, 331–350.
- Fromme, K., Katz, E. C., & Rivet, K. (1997). Outcome expectancies and risk-taking behavior. *Cognitive Therapy and Research*, *21*, 421–442.
- Gilbert, P. (2001). Evolution and social anxiety: The role of attraction, social competition, and social hierarchies. *Psychiatric Clinics of North America*, *24*, 723–751.
- Gross, J. J., & Levenson, R. W. (1993). Emotional suppression: Physiology, self-report, and expressive behavior. *Journal of Personality and Social Psychology*, *64*, 970–986.
- Ham, L. S., & Hope, D. A. (2005). Incorporating social anxiety into a model of college student problematic drinking. *Addictive Behaviors*, *30*, 127–150.
- Johnston, L. D., O'Malley, P. M., Bachman, J. G., & Schulenberg, J. E. (2004). *Monitoring the Future national survey results on drug use, 1975-2003: Volume II, College students and adults ages 19-45* (NIH Publication No. 04-5508). Bethesda, MD: National Institute on Drug Abuse.
- Kashdan, T. B. (2004). The neglected relationship between social interaction anxiety and hedonic deficits: Differentiation from depressive symptoms. *Journal of Anxiety Disorders*, *18*, 719–730.
- Kachin, K. E., Newman, M. G., & Pincus, A. L. (2001). An interpersonal problem approach to the division of social phobia subtypes. *Behavior Therapy*, *32*, 479–501.
- Katz, E. C., Fromme, K., & D'Amico, E. J. (2000). Effects of outcome expectancies and personality on young adults' illicit drug use, heavy drinking, and risky sexual behavior. *Cognitive Therapy and Research*, *24*, 1–22.
- Kidorf, M., & Lang, A. R. (1999). Effects of social anxiety and alcohol expectancies on stress-induced drinking. *Psychology of Addictive Behaviors*, *13*, 134–142.
- Kushner, M. G., Abrams, K., & Borchardt, C. (2000). The relationship between anxiety disorders and alcohol use disorders: A review of major perspectives and findings. *Clinical Psychology Review*, *20*, 149–171.
- Leary, M. R. (2001). Social anxiety as an early warning system: A refinement and extension of the self-presentation theory of social anxiety. In S. G. Hofmann & P. M. DiBartolo (Eds.), *From social anxiety to social phobia: Multiple perspectives*, (pp. 321–334). Needham Heights, MA: Allyn & Bacon.
- Lerner, J. S., & Keltner, D. (2001). Fear, anger, and risk. *Journal of Personality and Social Psychology*, *81*, 146–159.
- Mattick, R. P., & Clarke, J. C. (1998). Development and validation of measures of social phobia scrutiny fear and social interaction anxiety. *Behaviour Research and Therapy*, *36*, 455–470.
- Page, R. M., & Scanlan, A. (1999). Perceptions of the prevalence of marijuana use among college students: A comparison between current users and nonusers. *Journal of Child and Adolescent Substance Abuse*, *9*, 1–12.
- Rapee, R. M. (1995). Descriptive psychopathology of social phobia. In R. G. Heimberg, M. R. Liebowitz, D. A. Hope, & F. R. Schneier (Eds.), *Social Phobia: Diagnosis, assessment, and treatment*, (pp. 41–69). New York: Guilford Press.
- Stacy, A. W., Widaman, K. F., & Marlatt, G. A. (1990). Expectancy models of alcohol use. *Journal of Personality and Social Psychology*, *58*, 918–928.

- Staton, M., Leukefeld, C., Logan, T., Zimmerman, R., Lynam, D., Milich, R., et al. (1999). Risky sex behavior and substance use among young adults. *Health and Social Work, 24*, 147–154.
- Tran, G. Q., Haaga, D. A. F., & Chambless, D. L. (1997). Expecting that alcohol use will reduce social anxiety moderates the relation between social anxiety and alcohol consumption. *Cognitive Therapy and Research, 21*, 535–553.
- Watson, D., & Clark, L. A. (1991). *The mood and anxiety symptom questionnaire (MASQ)*. Unpublished manuscript, University of Iowa, Iowa City.