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Bracing for the worst, but behaving the best: Social anxiety, hostility, and behavioral aggression

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ABSTRACT

Social anxiety is marked by viewing social interactions as competitive, hypervigilance to signs of social threat, and avoidance of interactions that may result in social rejection. Therefore, social anxiety should relate to: (1) greater hostile feelings toward others, (2) heightened perceptions of hostility in others, and (3) relatively low levels of violence and aggression. To date, however, little is known about these relationships. In four independent non-clinical samples (total $N = 2643$), we examined relationships between social anxiety, hostility, and aggression using a range of measures that included both self-report and behavioral assessments. In Study 1, social anxiety correlated positively with feeling hostile toward others. In Study 2, social anxiety correlated positively with hostile perceptions of others. In Study 3, social anxiety was related to less positive attitudes toward behaving violently toward one's relationship partner. In Study 4, social anxiety was related to less aggressive behavior, as indicated by less intense and prolonged noise blasts delivered to a fictitious opponent. Taken together, these four studies paint a picture of socially anxious people as bracing for the worst by feeling and perceiving hostility in the social environment, but behaving the best by refraining from aggression and violence.

1. Introduction

As social animals, humans have a fundamental desire for positive and lasting relationships (Baumeister & Leary, 1995). This need to belong is deeply rooted in evolutionary history and has consequences for psychological processes. Satisfying one's need to belong is linked to individual, interpersonal, and societal well-being. For example, people who have a strong sense of social connection in their lives, compared to those who do not, have better physical and mental health (Cacioppo, Hawkley, & Berntson, 2003; Leary, 1990; Uchino, Cacioppo, & Kiecolt-Glaser, 1996) and behave more benevolently toward others (Buckley, Winkel, & Leary, 2004; DeWall, Twenge, Gitter, & Baumeister, 2009).

Unfortunately, social anxiety – a phenomenon marked by fear and distress regarding potential negative evaluations from others – often thwarts individuals' need to belong. Both subclinical and clinical levels of social anxiety (i.e., social anxiety disorder [SAD], also known as social phobia), have a particularly chronic course with early age onset and low rates of recovery (Davidson, Hughes, George, & Blazer, 1993). Social anxiety relates not only to fear of negative evaluation, but it also relates to depression, suicidal ideation, suicide attempts, and substance abuse (Buckner, Bernert, Cromer, Joiner, & Schmidt, 2008; Buckner, Schmidt, et al., 2008; Buckner, Schmidt, Bobadilla, & Taylor, 2006; Davidson et al., 1993; Grant et al., 2005; Kessler et al., 1997; Kessler, Stang, Wittchen, Stein, & Walters, 1999). Of particular relevance to the current investigation, social anxiety is linked to problems with interpersonal functioning (Schneier et al., 1994; Stein, Torgrud, & Walker, 2000). Thus, social anxiety is related to great personal suffering and high public health costs (Greenberg et al., 1999). Even at subclinical levels social anxiety can be disruptive for interpersonal functioning, an issue to which we now turn.

1.1. Social anxiety and hostility toward others

Social anxiety relates not only to problems with individual functioning, but the chronic fear of rejection indicative of social anxiety is thought to distort how people view social interactions. In fact, socially anxious people tend to view social interactions as competitions—competitions they usually lose (Rapee & Heimberg, 1997). Therefore, social anxiety may relate to feeling hostile toward others and perceiving hostility in others. To date, relatively little research has investigated these possible links between social anxiety and hostility.

In one of the few studies examining the link between social anxiety and hostility, social anxiety correlated positively with

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hostile feelings toward others (Gilbert & Miles, 2000). Relatedly, patients with SAD, compared with non-clinical controls, have higher trait anger levels (Erwin, Heimberg, Schneier, & Liebowitz, 2003) and exhibit anger and hostility toward others (Kachin, Newman, & Pincus, 2001). Other work has identified a sub-class of people with SAD who show signs of behavioral disinhibition, including heightened levels of anger and aggression (e.g., Kashdan, Elhai, & Breen, 2008; Kashdan & Hofmann, 2008; Kashdan, McKnight, Richey, & Hofmann, 2009).

1.2. Social anxiety and perceived hostility from others

Just as people with social anxiety may develop hostility toward others as a result of others' ability to outperform them in social situations, socially anxious people may assume others view social situations as competitions as well. They may therefore assume others feel as hostile toward them as they feel toward others. Indeed, people tend to perceive competitors as more hostile compared to non-competitors (e.g., Anderson & Morrow, 1995; Sherif & Sherif, 1953). Thus, social anxiety might relate to bracing for the worst in social interactions by perceiving high levels of hostility in one's environment.

Despite theoretical models positing that social anxiety relates to assuming others are critical (Clark & Wells, 1995; Rapee & Heimberg, 1997), data testing this hypothesis are mixed. Some work shows that people with SAD, compared to non-clinical controls, rate social interaction partners as friendlier (Alden & Wallace, 1995). Yet other reports find that people with relatively high levels of social anxiety, compared to those with relatively low levels of social anxiety, are more likely to assume others judge them negatively (Leary, Kowalski, & Campbell, 1988). The current studies seek to resolve these conflicting findings. We predict that social anxiety will correlate positively with feeling hostile toward others and perceiving hostility in others.

1.3. Social anxiety and behavioral aggression

Although socially anxious people may be hypervigilant for hostility in their environment, they may be less likely than their non-socially anxious counterparts to behave aggressively toward others out of fear that others will judge them negatively for behaving aggressively. Behaving aggressively is linked to rejection and negative evaluation among both children (Juvonen & Gross, 2005) and adults (Gottfredson & Hirschi, 1990). It is therefore not surprising that higher levels of social anxiety relate to suppressing emotions associated with aggressive behavior, such as anger (Erwin et al., 2003). Weber, Wiedig, Freyer, and Gralher (2004) showed that social anxiety correlated negatively with self-reported frequency of providing non-hostile feedback to others when angry, correlated positively with reports of acting submissively when angry and ruminating about the event, and was unrelated to actual aggression after experiencing laboratory-induced anger. It therefore remains unclear whether social anxiety is in fact related to less aggressive behaviors or whether people with social anxiety merely report they are less aggressive. To resolve much ambiguity in the literature, one study in the current investigation (Study 4) examined the relationship between social anxiety and actual aggressive behavior.

Why might socially anxious people not act aggressively toward others? Various models of aggression in samples unselected for anxiety argue that hostile cognitions can serve as a precursor to actual aggressive behavior (e.g., Anderson & Bushman, 2002; Berkowitz, 1990). However, we propose that, despite feeling hostility toward others, the fear of negative evaluation should lead socially anxious people to behave the best—with low levels of aggression. In the case of social anxiety, elevated perceptions of hostility should serve as a cue to avoid potential rejectors rather than engaging them through aggressive actions. We propose that social anxiety will relate to behaving less aggressively. However, we know of no published research examining how social anxiety relates to attitudes toward behaving aggressively and actual aggressive behavior in the laboratory. The current studies, therefore, are poised to make a novel contribution to both the social anxiety and aggression literatures.

Prior work from the social anxiety and aggression literatures lend some support to our prediction of relatively low levels of aggression among the socially anxious, even in the presence of heightened perceptions of hostility. Socially anxious people generally show signs of being risk-averse, shy, and behaviorally inhibited (Leary, 2001; Maner et al., 2007). Of particular importance, socially anxious people, compared to their non-socially anxious counterparts, tend to show signs of behavioral and physiological withdrawal when confronted with socially threatening situations (Liebowitz, 1987; Maner, Miller, Schmidt, & Eckel, 2008).

Aggression involves a variety of approach-relevant emotions and behaviors. In a recent and authoritative review of the literature, Carver and Harmon-Jones (2009) argued that anger relates to an approach motivational system, whereas anxiety relates to an avoidance motivational system. For example, feelings of anger correlate with relative left frontal activity, which in turn relates to aggression (Harmon-Jones & Sigelman, 2001). Other work has shown that behavioral inhibition, which correlates with trait anxiety, was related to giving less critical feedback to a person who had behaved in a conflictual manner (Wingrove & Bond, 1998). Thus, theory and empirical evidence suggest that anxiety may relate to a general tendency to avoid situations that may call for aggression—and may result in lower levels of aggression when people are actually placed in an aggressive situation.

1.4. Present research

Although prior work has provided some evidence for links between social anxiety and hostility or anger (e.g., Erwin et al., 2003; Gilbert & Miles, 2000; Henderson & Zimbardo, 1998), few studies have systematically examined the relations between social anxiety, hostility, and aggression. We conducted four studies to test our hypotheses that: (1) social anxiety relates to heightened feelings of hostility toward others, (2) social anxiety relates to perceiving others as hostile, (3) social anxiety relates to less positive attitudes regarding the use of aggressive behaviors, and (4) social anxiety relates to less aggressive actual behavior.

2. Study 1

Study 1 provided an initial test of our hypothesis that social anxiety is linked to heightened feelings of hostility toward others. A large undergraduate sample completed measures of social anxiety, depression, and hostile feelings toward others. Consistent with prior work (Erwin et al., 2003; Gilbert & Miles, 2000; Henderson & Zimbardo, 1998; Kachin et al., 2001), we hypothesized that social anxiety would correlate positively with hostile feelings toward others. We extended prior work by examining whether the social anxiety–hostility link would remain after controlling for depression and participant gender.

2.1. Method

2.1.1. Participants

Participants were undergraduate students who were approached via email to participate in an on-line survey and offered a chance to win one of 10 monetary prizes ($25) for

participating. Email addresses were obtained from the Dean of Students Office. Of the 7951 students invited to participate, response rate was approximately 27% ($n = 2145$). Of these responses, 21% ($n = 456$) of the questionnaires were discarded because of incomplete responses ($n = 443$) or questionable validity ($n = 13$; detailed below). Thus, the final sample was comprised of 1689 (63.2% female) students. The racial/composition of the sample was 83.6% Caucasian and 16.4% ethnic minority. Average age was 20.04 ($SD = 3.50$). The informed consent form was included in the on-line survey.

2.1.2. Procedures

The survey was administered using surveymonkey.com, a secure on-line data collection website. Computerized versions of self-report measures have been found to produce scores equivalent to and highly correlated with paper-and-pencil versions (Gwaltney, Shields, & Shiffman, 2008). There are several advantages of computerized versions including: (1) missing data can be reduced by requiring answers before allowing the respondent to move on to the next item, (2) complex skip patterns can be programmed that could normally confuse participants, (3) effort and error associated with data entry are reduced because there is no manual entering of data by research assistants, and (4) time-stamps can be placed when participants fill out measures to validate compliance (Gwaltney et al., 2008).

2.1.3. Measures

2.1.3.1. Social Interaction Anxiety Scale (SIAS). The SIAS is a measure of social interaction fears that corresponds to the description of generalized SAD (Mattick & Clarke, 1998). The scale demonstrates high levels of internal consistency across clinical, community, and student samples (Heimberg, Mueller, Holt, Hope, & Leibowitz, 1992; Mattick & Clarke, 1998; Osman, Gutierrez, Barrios, Kopper, & Chiros, 1998), test–retest reliability in clinical and non-clinical samples (Heimberg et al., 1992; Osman et al., 1998), and the ability to distinguish people with SAD from those who do not have SAD (Brown et al., 1997). The SIAS demonstrated excellent internal consistency in the present sample ($\alpha = .93$) and when used in other on-line studies (e.g., Buckner & Schmidt, 2008). Average score was 22.46 ($SD = 13.64$; range 0–76), which is consistent with that found in other undergraduate samples (Buckner, Eggleston, & Schmidt, 2006; Buckner & Schmidt, 2008).

To increase generalizability to individuals with SAD, a cutoff score was used to identify those with clinically meaningful social anxiety problems. Prior research indicates that one standard deviation above a community sample mean ($M = 19.9$, $SD = 14.2$) on the SIAS correctly classified 82% of patients with SAD (Heimberg et al., 1992). This cutoff score was used to identify participants with clinically significant social anxiety ($n = 325$). A random selection of 325 participants scoring below the SIAS community sample mean was selected to comprise the non-SAD comparison group. This group did not differ from the SAD group on gender ($\chi^2(1, 650) = .42$, $p = .52$) or race ($\chi^2(1, 650) = 2.24$, $p = .13$).

2.1.3.2. Brief Symptom Inventory (BSI). The BSI (Derogatis & Melisaratos, 1983), a self-report measure of psychiatric symptomatology over the past month with extensive use in prior studies, was employed here. The BSI subscales have shown high internal consistency, test–retest reliability, convergent validity and a consistent factor structure in multiple normative samples (Derogatis & Melisaratos, 1983). It has also been successfully used to assess distress using on-line data collection (e.g., Schlenger et al., 2002). We were interested in the hostility ($\alpha = .78$) and depression ($\alpha = .89$) subscales which each showed good internal consistency in our sample. Higher hostility and depression scores reflect higher levels of hostile feelings toward other people and depressive symptoms, respectively.

2.1.3.3. Infrequency Scale. To identify responders who provided random or grossly invalid responses, we included four questions from the Infrequency Scale (Chapman & Chapman, 1983). This includes items such as "I believe that most light bulbs are powered by electricity" and "I find that I often walk with a limp, which is the result of a skydiving accident." As in prior on-line studies of this kind (e.g., Cohen, Iglesias, & Minor, 2009), individuals who endorsed three or more infrequency items were excluded from this study.

2.2. Results

2.2.1. Sample characteristics

In the overall sample, social anxiety was significantly related to depression, $r = .60$, $p < .001$. However, women ($M = 13.47$, $SD = .42$) did not differ from men ($M = 13.92$, $SD = .57$) on level of social anxiety, $F(1, 1614) = 1.18$, $p = .278$. Men ($M = 8.78$, $SD = 3.46$) reported somewhat more hostile feelings toward others compared to women ($M = 8.43$, $SD = 3.27$), $F(1, 1596) = 4.00$, $p = .046$. Hostility correlated positively with depression ($r = .64$, $p < .001$).

In the clinical analogue sample, the SAD group ($M = 44.02$, $SD = 8.50$) reported more social anxiety than the non-SAD group ($M = 18.11$, $SD = 8.65$), $F(1, 649) = 1484.23$, $p < .001$. These means are comparable to those found in clinical versus non-clinical samples (Weeks et al., 2005) and prior work using this SIAS clinical cut-score (Buckner, Bernert, et al., 2008; Buckner, Schmidt, et al., 2008; Ham & Hope, 2005). The SAD group ($M = 18.21$, $SD = 6.5$) also reported more depression than the non-SAD group ($M = 11.04$, $SD = 4.38$), $F(1, 640) = 263.21$, $p < .001$.

2.2.2. Relations between social anxiety and hostility

We examined relations between social anxiety and hostility in the entire sample and in the clinical analogue subsample. To provide a stringent test of our hypothesis, we performed a multivariate regression analysis in which social anxiety, depression, and participant gender were included as predictors to examine whether SIAS scores remained related to hostility after accounting for the variance attributable to depression and to participant gender. As expected, social anxiety was a significant positive predictor of hostile feelings toward others, even after controlling for depression and participant gender, $\beta = .06$, $t(1596) = 2.69$, $p = .007$.

The clinical analogue sample showed similar results. The SAD group ($M = 11.10$, $SD = 4.05$) reported more hostile feelings toward others than the non-SAD group ($M = 7.83$, $SD = 2.62$), $F(1, 640) = 146.67$, $p < .001$. ANCOVA showed that this difference remained significant after controlling for both depression and participant gender, $F(1, 641) = 8.74$, $p = .003$.

2.2.3. Discussion

Results from Study 1 provided initial support of our hypothesized relationship between social anxiety and hostility. Social anxiety correlated positively with hostile feelings toward others, and this relationship remained significant after controlling for depression and participant gender. This relationship between social anxiety and hostility appeared to be stronger among our clinical analogue sample. Indeed, the relationship between social anxiety and hostility was nearly twice as strong among the clinical analogue sample ($d = .23$) relative to the entire sample ($d = .13$). Thus, our findings have significance for people with and without clinically significant levels of SAD.

3. Study 2

Results from Study 1 supported our hypothesis that social anxiety would relate to heightened levels of hostility. We conducted Study 2 to replicate and extend these results and to address potential limitations of that study. First, given the multifaceted nature of social anxiety (comprised of social interaction fears, performance fears, etc.), we used a different measure of social anxiety, namely the Brief Fear of Negative Evaluation scale (BFNE; Leary, 1983), which assesses fear of negative evaluation—a core component of pathological social anxiety. This strategy allowed us to determine whether the relation between social interaction anxiety and hostility observed in Study 1 is robust across different measures. Second, conducting a second study allowed us to determine whether the significant results of Study 1 represent a reliable association between social anxiety and hostility or if the results from that study were due to a relatively large sample size. Third, we used a different measurement tool to assess chronic hostility. Whereas the measure we used in Study 1 focused primarily on feeling hostile toward others, Study 2 used a measure that assesses perceptions of hostility in others.

3.1. Method

3.1.1. Participants

Eighty-four undergraduates (66 women, 18 men) participated in this study in exchange for partial extra credit. The racial composition of the sample was 60.7% Caucasian and 30.3% ethnic minority. Age was not recorded in this study, but the sample was taken from a family studies course in which the average age of students tends to be approximately 20 years (e.g., Cui, Fincham, & Pasley, 2008).

3.1.2. Materials and procedure

Participants completed all aspects of the study over the internet using the same program as in Study 1. After giving informed consent, participants completed the well-validated Brief Fear of Negative Evaluation scale (BFNE; Leary, 1983; Weeks et al., 2005) using the straightforward wording suggested in prior reports (Carleton, McCreary, Norton, & Asmundson, 2006; Taylor, 1993). Participants also completed the Center for Epidemiological Studies-Depression scale (CES-D; Radloff, 1977). The BFNE ($M = 33.51$, $SD = 11.63$; $\alpha = .96$) and CES-D ($M = 37.14$, $SD = 11.79$; $\alpha = .94$) had excellent internal reliability and means that were consistent with means found in other non-clinical college samples (Buckner, DeWall, Schmidt, & Maner, in press; Gilbert & Miles, 2000).

After completing the BFNE and CES-D, participants completed the Aggression Questionnaire (AQ; Buss & Perry, 1992). We focused our analysis on responses to the hostility subscale of the AQ, which includes items such as "I am suspicious of overly friendly strangers." The internal reliability of the AQ-Hostility subscale was $\alpha = .91$. When participants had finished the AQ, they received a debriefing.

3.2. Results

3.2.1. Sample characteristics

As in Study 1 and prior work, social anxiety correlated positively with depression, $r = .51$, $p < .001$. Men ($M = 30.00$, $SD = 9.62$) and women ($M = 34.47$, $SD = 12.00$) did not differ in their level of social anxiety, $F(1, 82) = 2.12$, $p = .15$. We also found no gender differences on AQ-Hostility scores, $F < 1$. Depression correlated positively with AQ-Hostility ($r = .57$, $p < .001$).

3.2.2. Relations between social anxiety and hostility

We sought first to extend the results from Study 1 by showing that social anxiety correlated positively with AQ-Hostility, even after controlling for depression and participant gender. As expected, results from a multivariate regression analysis demonstrated that social anxiety correlated positively with perceptions of hostility after controlling for both gender and depression, $\beta = .27$, $t(79) = 2.58$, $p = .01$. Thus, social anxiety showed a robust relationship with AQ-Hostility, such that social anxiety related to showing signs of bracing for the worst in one's social interactions.

3.2.3. Discussion

Results from Study 2 offered additional evidence regarding the relationship between social anxiety and hostility. As in Study 1, social anxiety correlated positively with a measure of hostility, even after controlling for the effects of depression and participant gender. These findings suggest a robust association between social anxiety and perceptions of hostility. What these findings do not do, however, is test our third and fourth hypotheses, which predict that social anxiety will relate to less positive attitudes toward behaving violently and to less aggression behavior in a laboratory setting. Studies 3 and 4 did just that.

4. Study 3

Having shown that social anxiety related to both feeling hostility toward others and perceiving hostility from others, we set forth to test our hypothesis that social anxiety would relate to less positive attitudes toward behaving aggressively. In Study 3, participants completed measures of social anxiety, depression, and attitudes toward behaving violently in one's romantic relationship. Intimate partner violence (IPV) is a growing concern nationally and on college campuses. For example, each year 34% of college students report at least one act of physical violence in their relationship (Straus & Ramirez, 2002). We predicted that social anxiety would relate to less positive attitudes toward behaving violently against one's partner, presumably because violent acts could be evaluated negatively by others.

4.1. Method

4.1.1. Participants

Eight hundred forty-three undergraduates (689 women, 153 men, 1 did not report gender) participated in exchange for partial course credit. Participants reported about their romantic partner or, in the absence of a romantic partner, their most important interpersonal relationship. The racial composition of the sample was 71.8% Caucasian and 28.2% ethnic minority. Average age was 19.00 ($SD = 1.67$).

4.1.2. Materials and procedure

Participants arrived at the laboratory in small groups to complete a study designed to investigate the association between different aspects of personality and interpersonal relationships. After giving informed consent, participants completed all of the study measures. First, participants completed the intimate partner violence attitude scale-revised (IPVAS-R; Fincham, Cui, Braithwaite, & Pasley, 2008). The IPVAS-R contains three subscales: violence (e.g., "Threatening a partner with a knife or gun is never appropriate"; $\alpha = .65$), abuse (e.g., "During a heated argument, it is okay for me to say something just to hurt my partner on purpose"; $\alpha = .79$), and control (e.g., "I think my partner should give me detailed account what he or she did during the day"; $\alpha = .64$). Lower scores on the IPVAS-R violence subscale indicate more positive attitudes toward behaving violently against one's partner, whereas higher scores on the abuse and control subscales reflect more positive attitudes toward abuse and control in one's relationship. The sample mean for the IPVAS-R violence subscale

was 4.56 (*SD* = .71), whereas the average abuse and control scores were 1.59 (*SD* = .55) and 3.89 (*SD* = .69), respectively. Because this study focused specifically on the relationship between social anxiety and violence, IPVAS violence scores were the primary dependent measure.

Next, participants completed the BFNE (Leary, 1983) using the straightforward wording suggested in prior reports (e.g., Carleton et al., 2006). The internal reliability and mean BFNE score (M = 32.89, SD = 11.13; α = .95) were similar to Study 2. Participants also completed a 10-item version of the CES-D (Radloff, 1977). We used a 10-item version of the CES-D (M = 18.13; SD = 4.72; α = .76) instead of the standard 20-item version used in Studies 2 and 4 because participants completed several other measures unrelated to the current investigation. After participants had completed all of the questionnaires, they were debriefed.

4.2. Results

4.2.1. Sample characteristics

As in Studies 1 and 2, social anxiety correlated positively with depression, r = .37, $p < .001$. Unlike Studies 1 and 2, but consistent with other reports (Grant et al., 2005; Weinstock, 1999), we found that men (M = 31.40, SD = 10.99) reported marginally lower levels of social anxiety compared to women (M = 33.25, SD = 11.13), $F(1, 850) = 3.56$, p = .06. Results revealed no significant gender differences in scores on the IPVAS-R violence subscale, $F < 1$, *ns*. Depression correlated (marginally) negatively IPVAS-Violence ($r = -.06$, $p < .10$).

4.2.2. Relationship between social anxiety and attitudes toward intimate partner violence

We predicted that social anxiety would relate to less positive attitudes toward behaving violently against one's partner, even after controlling for participant gender, depression, and scores on the IPVAS-R abuse and control subscales. To test our hypothesis, we conducted two multivariate regression analyses. In the first analysis, we predicted IPVAS-R violence scores from social anxiety, controlling for participant gender and depression. In the second analysis, we added IPVAS-R abuse and control scores as additional covariates to determine whether social anxiety continued to have a unique effect on attitudes toward engaging in physical violence against one's partner. Theoretical and empirical work has shown that violence is related to, but distinct from, variables related to non-violent anti-social behavior (e.g., Anderson & Bushman, 2002). Hence controlling for abuse and control subscale scores offered an especially stringent test of our hypothesis. As predicted, social anxiety was significantly related to less positive attitudes toward engaging in violent physical conflict with one's partner after controlling for participant gender and depression, β = .08, $t(824) = 2.04$, p = .04, and after IPVAS abuse and control scores were added to the model, β = .11, $t(822) = 3.22$, p = .001.

4.2.3. Discussion

Results from Study 3 provided additional support for our conceptual framework for understanding the relationships between social anxiety, hostility, and aggression. As expected, social anxiety was associated with less positive attitudes toward behaving violently against one's relationship partner. This effect was quite robust, remaining significant after controlling for depression, participant, gender, and attitudes toward abuse and control in one's relationship.

5. Study 4

Study 4 sought to replicate and extend Study 3 findings in two ways. First, we measured actual aggressive behavior instead of attitudes toward behaving violently. Second, we wanted to determine whether the results of Study 3 would extend beyond an intimate relationship partner to aggression against a stranger. Clinical observation suggests that some socially anxious people are more concerned with negative evaluation from people to whom they are close versus a stranger with whom they may never interact again. It is therefore conceivable, although unlikely, that socially anxious people may be more likely to behave aggressively with strangers than with intimate partners. By providing an assessment of actual aggressive behavior toward a stranger, we would be given a chance to provide converging evidence in support of our hypothesis thus far assessed solely via self-report.

5.1. Method

5.1.1. Participants

Twenty-seven undergraduates (16 women, 11 men) participated in exchange for partial course credit. The racial/composition of the sample was 84% Caucasian and 16% ethnic minority. Average age was 19.12 (*SD* = 0.97).

5.1.2. Materials and procedure

Participants arrived at the laboratory individually for a study concerning the effects of limitations on initial meeting encounters. After giving informed consent, participants completed the same BFNE (Leary, 1983) used in Studies 2 and 3. The internal reliable and mean of the BFNE score was similar to Studies 2 and 3 (M = 32.84, SD = 10.55; α = .95) and prior research (Studies 2–3; Buckner et al., in press; Gilbert & Miles, 2000). Participants also completed the CES-D (Radloff, 1977). The mean CES-D score was 30.43 (*SD* = 6.44), which is consistent with other non-clinical undergraduate samples (Gilbert & Miles, 2000). The CES-D also demonstrated excellent internal reliability (α = .91).

After completing the BFNE and CES-D, participants were informed that they would be sending video messages back and forth with a same-gender partner with whom they will engage in an interaction. In reality, the other participant was a confederate. We used this protocol to enhance credibility of the cover story that participants would be completing a competitive reaction-time task with an actual person. Because it did not involve interpersonal provocation, this protocol cannot be considered a manipulation to prime aggressive behavior.

Participants viewed a video message of their partner, which consisted of the partner answering questions about his or her personal and career goals. Next, participants completed a similar video message to be given to their partner. When the participant finished, the experimenter ostensibly took the participant's video for his or her partner to watch. After 5 min, the experimenter returned and informed participants that their partner would not have time to meet with them due to a forgotten appointment. The partner would have enough time, however, to complete the part of the experiment involving reaction times in competitive situations. The experimenter then explained the instructions for how to complete the competitive reaction-time task.

The competitive reaction-time task was based on a paradigm developed by Taylor (1967), which has been shown to be a safe and valid measure of aggression within a laboratory setting (Anderson & Bushman, 1997; Giancola & Zeichner, 1995). The experimenter explained that participants would have to press a button as quickly as possible on a series of 25 trials, and that whoever responded slower on a given trial would hear a blast of white noise. In actuality, the computer was programmed to mimic a person's responses. At the beginning of each trial, participants set the level of noise their partner would receive if their partner lost the competition, from 60 dB (*Level 1*) to 105 dB (*Level 10*, about the same volume as a smoke alarm). A non-aggressive no-noise level

(*Level 0*) was also provided. They could also control how long their partner heard the noise (0–5 s). Of the 25 trials, the participant won 12 (randomly determined), though the participant set the noise intensity and duration levels for the opponent before each of the 25 trials in case the participant would win the trial. Basically, within the ethical limits of the laboratory, participants controlled a weapon that could be used to blast their partner with loud and prolonged noise.

Noise intensity and duration levels from the 25 trials were used as the measure of aggression. The two variables (intensity and duration) were converted to *z*-scores and averaged to form a composite measure of aggression. Similar scoring procedures have been used with this measure of aggression (e.g., Bushman & Baumeister, 1998). After participants completed the competitive reaction-time game, they were probed for suspicion and were debriefed. No participant reported suspicion that they were playing the competitive reaction-time task against another person or guessed the hypothesis of the study.

5.2. Results

5.2.1. Sample characteristics

As in the previous three studies, social anxiety correlated positively with depression, $r = .35$, $p < .05$. Also consistent with our first two studies, men ($M = 30.55$, $SD = 8.92$) did not differ from women ($M = 33.55$, $SD = 11.09$) in terms of their social anxiety scores, $F < 1$. In addition, men and women did not differ in their level of aggression, $F < 1$. Depression was unrelated to aggression ($r = .07$).

5.2.2. Aggressive behavior

The main hypothesis of this study was that social anxiety would correlate with less aggressive behavior, an effect that would remain significant after controlling for depression and participant gender. As expected, a multivariate regression analysis revealed a strong negative association between BFNE scores and behavioral aggression, which remained significant after controlling for both depression and participant gender, $\beta = -.51$, $t(23) = -2.48$, $p = .02$. Thus, social anxiety was related to less aggressive behavior within a laboratory paradigm.

5.2.3. Discussion

Results from Study 4 offer additional evidence supporting our hypothesis that when confronted with a situation laden with the potential for conflict (i.e., being blasted with noise from a stranger), social anxiety relates to engaging in less aggressive behavior, presumably due to fear of negative evaluation for engaging in such aggressive acts. Findings from Study 4 replicate and extend the results of Study 3 in two ways. First, the relation between social anxiety and attitudes toward behaving violently observed in Study 3 were consistent with the link between social anxiety and actual aggressive behavior. Second, whereas Study 3 focused on attitudes toward behaving violently toward someone with whom participants had a close relationship, Study 4 showed that the social anxiety–aggression link has similar implications for aggression between strangers.

6. General discussion

Interpersonal relationships endow life with meaning, emotional well-being, and prosperity—but they can represent sources of fear and potential hostility among people with elevated social anxiety. A core feature of social anxiety is vigilance to sources of potential negative evaluation or rejection (Bar-Haim, Lamy, Pergamin, Bakermans-Kranenburg, & van IJzendoorn, 2007; Clark & Wells, 1995; Rapee & Heimberg, 1997). Socially anxious people are extremely concerned with being evaluated negatively and they should show a propensity to feel hostility toward others and to perceive people in their environment as relatively hostile (Leary et al., 1988), regardless of whether these perceptions correspond to actual threats. Being aware and perceptive to potentially hostile others does not necessarily result in heightened levels of aggression, however. Because behaving aggressively is consistently associated with being rejected and excluded across the lifespan (e.g., Gottfredson & Hirschi, 1990; Juvonen & Gross, 2005), social anxiety should relate to refraining from acting aggressively in an attempt to avoid negative evaluation. Thus, social anxiety should relate to less positive attitudes toward engaging in violent behavior and less actual aggressive behavior within a laboratory setting.

Results from our four studies provided converging evidence in support of these hypotheses. Social anxiety related to hostile feelings toward others (Study 1) and hostile perceptions of others (Study 2). These links between social anxiety and hostility were found across two different measures of social anxiety (SIAS in Study 1 and the BFNE in Study 2) and across two different measures of hostility (hostile feelings toward others as measured by the BSI-Hostility in Study 1; perceptions of hostility in others as measured by the AQ-Hostility in Study 2). More important, however, were the findings showing that the relation between social anxiety and hostility remained significant after controlling for depression and participant gender, which are two variables that have an extensive history predicting hostility and aggression (Anderson & Bushman, 2002).

Despite greater feelings and perceptions of hostility, data from Studies 3 and 4 showed that social anxiety was related to less aggressive attitudes and behavior. In Study 3, social anxiety was related to expressing less positive attitudes toward engaging in violent behaviors toward one's relationship partner, such as threatening a partner with a knife or kicking, biting, or hitting a partner with an object. Given the relatively high rate of intimate partner violence nationally and among college students (Straus & Ramirez, 2002), our results suggest that even though social anxiety relates to interpersonal problems (Schneier et al., 1994; Stein et al., 2000), it does not predict more positive attitudes toward intimate partner violence. Study 4 extended the results of Study 3 by measuring actual aggressive behavior. Participants completed a competitive reaction-time task in which they received and administered blasts of noise that varied in intensity and duration. This paradigm for measuring aggression has high levels of internal and external validity (e.g., Anderson & Bushman, 1997; Giancola & Chermack, 1998; Giancola & Zeichner, 1995). Social anxiety was associated with less aggressive behavior. In both Studies 3 and 4, the inverse relationship between social anxiety and aggression was significant even after controlling for a variety of relevant covariates. Thus, social anxiety was related to an attitude and behavior profile that would reduce the chances of being evaluated negatively or being rejected, namely relatively low levels of endorsing the use of violence in one's relationship and low levels of aggressive behavior toward a stranger.

The broader implication from these results is that social anxiety relates to bracing for the worst in one's social interactions by feeling hostile toward others and by perceiving others as relatively hostile. Such hypervigilance to potential hostility likely inhibits interpersonal relationships, because people with elevated social anxiety levels tend to misperceive neutral or ambiguous actions as hostile (e.g., Winton, Clark, & Edelman, 1995). To be sure, negative associations between social anxiety and attitudes toward violence and aggressive behavior are desirable in an absolute sense. Although social interactions can involve conflict, ostracism, or even outright rejection, not responding to such conflict with approach-motivated behaviors may prove detrimental in enabling

socially anxious people to obtain and maintain positive and lasting relationships with others.

Our findings that social anxiety relates to greater hostile feelings toward and perceptions of others but lower inclinations to act on these feelings and perceptions may represent a cause for concern. Those who experience but suppress anger, compared to those who do not suppress anger, have higher rates of impairment and treatment non-compliance (Begley, 1994; Clay, Anderson, & Dixon, 1993). In addition, suppressing anger is consistently linked to physiological problems, such as hypertension (e.g., Cottington, Matthews, Talbott, & Kuller, 1986; Diamond, 1982; Vogele, Jarvis, & Cheeseman, 1997). Higher levels of pre-treatment hostility and anger also relate to treatment drop-out among patients receiving cognitive behavioral therapy for SAD (Erwin et al., 2003). Because the vast majority of people with SAD do not seek treatment and that those who do seek treatment only have many years of suffering (Grant et al., 2005), it is unfortunate that those with the greatest anger may not complete the full course of treatment and, one would assume, fail to recover. Thus, clinicians may want to assess their SAD patients' anger at intake and directly target and/or monitor patients' anger during treatment in order to prevent premature termination.

6.1. Limitations and future directions

The four studies provided consistent evidence in support of our hypotheses as to the relations between social anxiety, hostility, and aggression. There are some limitations, however, that warrant consideration and that may serve as a mainspring for future research. First, our research focused on non-clinical samples. Results from Study 1 suggest that the relation between social anxiety and hostility toward others may have been even more pronounced among participants evincing clinically meaningful social anxiety. Thus our findings may represent a conservative estimate of the strength of the relations between social anxiety and hostility/aggression. Future research examining these constructs with treatment-seeking patients with diagnosed SAD is warranted.

A second limitation to these results is that we did not explore the heterogeneous nature of social anxiety in our samples. As noted in the introduction, Kashdan et al. (2009) have shown that some (perhaps most) socially anxious people show signs of bias toward perceiving environmental threat and avoidant behavior within situations marked by conflict ("Class One"), which corresponds to the results of our four studies. Another class of socially anxious people, however, have relatively high levels of behavioral disinhibition and aggressive behavior ("Class Two"; Kashdan et al., 2009). Therefore, it is possible that our findings may be limited to "Class One" socially anxious people, whereas our results would be reversed among "Class Two" socially anxious people. This question remains for future research.

A third limitation is that we tested our four hypotheses in four independent samples instead of in one large sample. We cannot be sure, for example, that the robust association between social anxiety and hostility shown in Studies 1 and 2 had implications for reducing attitudes toward behaving aggressively in Study 3 or actual aggressive behavior in Study 4. Although testing our conceptual framework in this somewhat piecemeal fashion could be considered a weakness, providing converging evidence across multiple samples is an especially conservative hypothesis-testing strategy. Across multiple samples, methods, and measures, our data consistently supported each of our hypothesized relations between social anxiety, hostility, and aggression. Future work may consider testing each of our hypotheses within a single sample.

A potential avenue for future research may investigate how basic cognitive processes may underlie the relationships between social anxiety, hostility, and aggression. A large body of literature suggests that basic, early-in-the-stream cognitive processes, such as visual attention, serve as the building blocks that give rise to more "down-stream" processes such as judgments and behaviors (e.g., DeWall, Maner, & Rouby, 2009; Fox, Russo, Bowles, & Dutton, 2001). It is therefore possible that prior findings of attentional bias to signs of social threat among socially anxious people may have implications for them perceiving hostility in their environment and for them withdrawing from situations marked with the potential for aggression and violence.

If basic attentional processes serve as a mechanism underlying our effects, then an experimental manipulation designed to attenuate socially anxious people's attentional bias toward signs of social threat may reduce their tendencies to perceive hostility in others. Recent research suggests that training people with SAD to direct their attention away from socially disapproving faces reduces overall social anxiety symptoms, resulting in a remittance rate of over 70% at a 6-month follow-up (Schmidt, Richey, Buckner, & Timpano, 2009). Thus, an attention retraining manipulation may cause SAD patients to perceive people and situations as less hostile and threatening compared to SAD patients who do not undergo the same attention retraining manipulation.

6.2. Concluding remarks

Social interactions can be both a blessing and a curse. Having positive and lasting relationships is linked to a host of positive outcomes. To maintain benefits of belongingness, people are naturally vigilant to people or situations that may threaten their need to belong, such as negative evaluation or social rejection. The curse, however, is that hypervigilance to signs of social threat is linked to the development and maintenance of social anxiety disorders, which are related to individual and interpersonal problems. Our research adds novel evidence to the social anxiety and aggression literatures by showing that social anxiety relates to bracing for the worst in social interactions, which takes the form of feeling hostility toward others and perceiving relatively high levels of hostility in others. Although people with elevated social anxiety levels brace for the worst, their natural propensity to avoid and withdraw from social interactions is related to less positive attitudes toward behaving violently and lower levels of aggressive behavior. The emerging portrait of the socially anxious person is one who shies away from conflict by readily expecting hostility from others but who behaves the best in situations that have the potential for aggression and violence.

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