Cognitive Therapy and Research, Vol. 28, No. 1, February 2004 (© 2004), pp. 119–141

Social Anxiety's Impact on Affect, Curiosity, and Social Self-Efficacy During a High Self-Focus Social Threat Situation[1]

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Upon being exposed to a high self-focus, potentially socially threatening situation, excessively socially anxious (SA) individuals were posited to experience amplified negative emotional states, as well as diminished positive emotional, cognitive, and intimacy-related outcomes. Ninety-one college students engaged in a reciprocal self-disclosure task with a trained confederate. Participants and confederates took turns answering (while a camera was directed at them) and asking questions that gradually increased in personal content. The results indicated that high SA individuals experienced more intense negative affect, less intense positive affect, and poorer social self-efficacy compared to low SA individuals in both conditions. However, differences between high and low SA individuals were larger in the social threat/self-focus condition, and self-focused attention partially accounted for these effects. In terms of specificity, nearly all findings remained after statistically controlling for depressive symptoms. In contrast, social anxiety effects were generally absent on measures of observed behavior and intimacy outcomes. These findings implicate the role of social threat and self-focused attention in contributing to affective and cognitive disturbances among SA individuals.

KEY WORDS: social anxiety; self-focused attention; negative affect; positive affect.

INTRODUCTION

Research has found that individuals with Social Anxiety Disorder (SAD) experience higher negative affect (NA) and judge their quality of life lower than control samples (Davidson, Hughes, George, & Blazer, 1994; Safren, Heimberg, Brown, & Holle, 1997). The term *social anxiety* is used herein to refer to a continuum of social fears ranging from social disinhibition, to shyness, to more severe distress and

[1] Portions of this paper were presented at the 2000 Annual Convention of the Association for Advancement of Behavior Therapy.

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0147-5916/04/0200-0119/0 © 2004 Plenum Publishing Corporation

impairment associated with SAD (cf. Rapee & Heimberg, 1997). Although some research has documented relationships between particular emotional states and social anxiety, to the authors' knowledge, no study has investigated the underlying mechanisms of relationships between social anxiety and their subjective experiences during social interaction. Moreover, the effect of social anxiety on positive emotional responses to social situations has been systematically neglected. This study tests the contribution of self-focused attention to affective, cognitive, and motivational disturbances among high-socially anxious (SA) individuals during dyadic social interactions.

Self-Focused Attention and Social Anxiety

Conscious attention can be directed outward, toward the environment, or inward, toward the self. For example, Ingram (1990) characterized attentional allocation as "a continuum with complete internal and external attention falling at the respective endpoints of the continuum and some balance between the two at the midpoint" (p. 167). Researchers have found that high-SA individuals respond to social evaluative situations with more self-focused attention than low-SA individuals (see Hartman, 1983; Hope, Gansler, & Heimberg, 1989 for reviews). Likewise, a more recent model posits that upon entering social situations, high-SA individuals instantly direct their attention both inwardly, focusing on negative self-appraisals and potential social failure, and outwardly, vigilantly scanning their social world for cues of rejection, such as negative or ambiguous facial expressions (Rapee & Heimberg, 1997). According to this model, a large portion of attentional resources is immediately allocated to negative information about the self and external social threat cues leading to social disengagement and performance deficits.

Affective and Motivational Disturbances Associated with Social Anxiety

There is fairly compelling evidence that high-SA individuals in socially threatening situations experience amplified negative affect (i.e., anxiety). We believe that Rapee and Heimberg's model (Rapee and Heimberg, 1997) also has implications for additional affective dimensions, including diminished positive subjective experiences. By closely attending to and monitoring internal and external cues of negative evaluation, high-SA individuals may neglect positive aspects of social interactions that are inconsistent with negatively distorted self-views. These distortions and biases are proposed to interfere with the ability to be a responsive social interaction partner, which contributes to positive interpersonal outcomes such as intimacy (Davis, 1982). We hypothesized that social threat and excessive self-focused attention lead to deficits in the hedonic quality (e.g., positive affect and cognitions) of social interactions.

Affect

Prior studies examining the influences of social anxiety, social threat, and self-focused attention on affect have narrowly focused on aroused negative affective

states such as anxiety (e.g., Bogels, Rijsemus, & DeJong, 2002; Woody, 1996; Woody & Rodriguez, 2000). Despite evidence for a negative relationship between social anxiety and aroused positive affect (Brown, Chorpita, & Barlow, 1998; Watson, Clark, & Carey, 1988), this work is tempered by a reliance on cross-sectional methods. To further delineate affective experiences associated with social anxiety, the present study examined high arousal (e.g., anxious, upset) and low arousal (e.g., bored, lethargic) negative affective states, and high arousal (e.g., excited, enthusiastic) and low arousal (e.g., calm, serene) positive affective states. These affective dimensions are relatively independent (Barrett & Russell, 1998). We also were interested in other positive subjective experiences with relevant ties to social anxiety and attention, namely curiosity and social self-efficacy.

Curiosity

To enter social interactions and develop relationships, individuals must engage in active steps to acquire information from others. Curiosity can be defined as attending, pursuing, and self-regulating opportunities for novelty and challenge (Kashdan, in press-a; Kashdan & Fincham, in press; Spielberger & Starr, 1994), eliciting exploratory behaviors such as information-seeking. Although global high arousal PA overlaps with curiosity, curiosity has been repeatedly shown to be independent from PA and other positive psychological constructs (Kashdan, 2002, in press-b; Kashdan & Roberts, in press). Integral to curiosity experiences is the ability to self-regulate attentional resources in the pursuit of potentially rewarding activities (Csiksentmihayli, 1990; Fredrickson, 1998). Interaction partners who exhibit greater verbal and nonverbal cues of interest in conversational topics and learning about their partner can be expected to invite more positive feedback. Individuals experiencing difficulties in responding appropriately to the information of interaction partners are likely to disrupt conversations and contribute to their own social rejection. We hypothesized that the attentional style of high-SA individuals would have a deleterious effect on curiosity during social interactions.

Self-Efficacy

On average, high compared to low-SA individuals are more likely to devalue their social performance, even when they are objectively successful (e.g., Clark & Wells, 1995). Evidence also finds that high-SA individuals are less likely to attribute success to themselves when interacting in front of a mirror (self-focus manipulation; Bogels et al., 2002). These findings are relevant to self-efficacy or beliefs that one can self-generate behaviors to obtain desired outcomes (Bandura, 1997). Because self-efficacy is context dependent, social self-efficacy appears to be important in understanding the maladaptive interpersonal affect and behavior of high-SA individuals (Bandura, 1977). When high-SA individuals are in socially threatening situations, being excessively self-focused may contribute to deficits in expectancies and perceptions of effortful mastery in social situations (i.e., social self-efficacy).

Social Functioning of Individuals With Social Anxiety

Individuals with SAD tend to be rated by observers as less effective and likeable during social performance tasks (Alden & Wallace, 1995; Stopa & Clark, 1993). Yet, other researchers found no social skill differences between individuals with SAD and normal controls (Rapee & Lim, 1992; Woody & Rodriguez, 2000). According to Heimberg and Juster (1995), individuals with SAD may simply experience difficulty *executing* social skills in social situations due to interfering cognitive processes. Rapee and Heimberg's model of social anxiety does not make predictions about the actual performance of high-SA individuals in social threat situations. More important "is the degree of discrepancy between the presumed appearance or behavior as perceived by the audience and the audience's assumed standards for evaluating this appearance/behavior" (p. 748). Thus, our primary interest was in the influence of social anxiety and self-focus on subjective social interaction experiences. Secondarily, we examined postinteraction feelings of closeness between interaction partners and objective ratings of behavior and affect.

Experimental Research on Social Anxiety and Self-Focused Attention

Researchers have examined the effects of self-focused attention as an explanatory variable for relationships between social anxiety and social affect, cognitions, and performance (Bogels et al., 2002; Woody, 1996; Woody & Rodriguez, 2000). Woody and her colleagues used a speech task in two separate studies. Conducted in pairs, each participant gave a set of two speeches on anxious cognitions and emotions whereas the other participant simply stood in front of the audience. To manipulate attentional focus, each participant gave one speech about their own anxiety (self-focus condition) and a second speech about the perceived anxiety of the participant next to them (control condition). In both studies, the self-focused condition led to greater subjective anxiety than the control condition. However, attentional focus had no impact on self or observer social performance ratings. Null findings may relate to the noninteractive nature of the social task (i.e., giving a speech). Bogels and her colleagues (2002) had participants interact with two confederates in an open-ended interaction either in front of mirrors (heightened self-focus) or not. There were no differences between these conditions on fear, blushing, physiological arousal, or social performance or concerns. However, a Group $\times$ Condition interaction was found such that high-SA individuals were more likely to believe that success was due to their partners than themselves in the self-focus condition compared to low-SA individuals.

Despite impressive methodological details, these studies had limitations we sought to address. A confound acknowledged by Woody (1996) is the likelihood that these "self-focus" manipulations also manipulated social threat and evaluation. The authors presented some evidence suggesting that their "self-focus" conditions led to predicted changes in self-focused attention. Nevertheless, there were no data that self-focused attention was the mechanism responsible for relationships between social anxiety and adverse outcomes. Tests of mediation were not conducted. Another unexamined issue is the specificity of social anxiety effects. Excessive social anxiety

and depression are highly comorbid conditions (e.g., Rapee, 1995), and excessive self-focused attention is a feature of both (and other syndromes such as schizophrenia; Ingram, 1990). It remains to be seen whether effects were due to dysphoria or social anxiety. Finally, speech performance tasks (e.g., Woody, 1996) fail to tap the dynamic, interactive element of social threat situations that are more relevant to the daily social activity (or avoided activity) of high-SA individuals. Using dyadic social interaction tasks may clarify the role that self-focused attention plays in generating distress and impairment. In Bogel's interaction task, the internal validity is questionable as there was no manipulation-check on confederate behaviors.

This Study

This study explored the main and interactive effects of social anxiety and social threat/attentional focus on affect, curiosity, and social self-efficacy during a reciprocal self-disclosure task. Despite the salient role of attentional processes in cognitive models of social anxiety (Clark & Wells, 1995; Rapee & Heimberg, 1997), there is little empirical validation of their specific role during dyadic social interactions. Specifically, does heightened self-focused attention and social threat have more deleterious effects on positive and negative affect, curiosity, and social self-efficacy among high-SA relative to low-SA individuals?

Social threat and attentional focus were manipulated with participants interacting with a confederate, taking turns answering and asking standardized questions that gradually increased in the personal disclosure necessary to answer them. In the social threat/self-focus (ST/SF) condition, participants answered questions while a camera was directed at them. In the neutral/external focus condition (N/EF), participants asked the scripted questions while the camera was directed at their interaction partner (the confederate). The ST/SF condition was designed to facilitate the negative cognitions of high-SA individuals during self-focused states, whereas the N/EF condition was designed to redirect attention away from the self by having participants read questions verbatim and silently listen to responses.

As a more conservative test of our hypotheses, we used a comparison group that represented the broad, normal range of social anxiety rather than low-SA, highly extraverted individuals. Although our high-SA sample was selected from the highest tier of social anxiety scores in a large college population, our low-SA sample was selected from a wider net of low to mid-range levels of social anxiety. We hypothesized that compared to the N/EF condition, the ST/SF condition would amplify differences between high and low-SA individuals in positive and negative affect (PA; NA), curiosity, and social self-efficacy. There have been mixed results as to whether high compared to low-SA individuals experience objective social performance deficits (e.g., Rapee & Heimberg, 1997), as well as poorer memory for social interaction details (e.g., Heinrichs & Hofmann, 2001, Hope, Sigler, Penn, & Meier, 1998). Most of the studies that failed to find group differences used speech performance and not dyadic interaction tasks. Thus, we hypothesized that after the social task, high compared to low-SA individuals would experience less interpersonal closeness with partners, and less memory for conversation details following the interaction. Additionally, high compared to low-SA individuals were expected to

differ in objective ratings of affect and performance. To test the specificity of effects, all significant findings were analyzed a second time controlling for depressive symptoms. The role of self-focused attention was tested as a mediator of all social anxiety effects.

METHOD

Participants

Participants were selected from undergraduate mass-testing sessions with the combined score of the Social Interaction Anxiety Scale and the Social Phobia Scale (SIAS/SPS; Mattick & Clarke, 1998). The high-SA group was randomly selected from the top 10% of the SIAS/SPS score distribution, and the low-SA group from the lower 50% of the distribution. For our low-SA group we obtained a sample comparable to the normal range of social anxiety as opposed to selecting for abnormally socially fearless or disinhibited individuals (i.e., extremely low social anxiety scores). An even gender distribution was selected for each group. Students reporting to the laboratory were given the SIAS/SPS a second time. To minimize false positives, any individual designated in the high-SA group had to score *higher* than 58.4. This score is one standard deviation below the mean of a large sample of SAD clients (Mattick & Clarke, 1998). To ensure a full range of nonclinical students, the low-SA group had to score *lower* than 43.2. This score was based on a normal range cut-off for undergraduates (Mattick & Clarke, 1998). The initial sample included 107 participants (53 low-SA and 54 high-SA). As a result of 9 participants (2 low-SA and 7 high-SA) being dropped because of status change across assessments, we had a final sample of 98 (51 low-SA and 47 high-SA). The final sample had 55 females (27 high-SA) and 43 males (20 high-SA). Our high-SA group reported SIAS/SPS scores ($M = 78.0$, $SD = 20.5$) similar to a sample of SAD clients ($M = 74.6$, $SD = 16.2$; Mattick & Clarke, 1998).

We used the SIAS/SPS as a continuous variable ($M = 47.27$, $SD = 33.46$) in all analyses for conceptual clarity (i.e., social anxiety is a continuous dimension) and greater statistical power, justified by a normal distribution (i.e., skewness of the SIAS/SPS was not different from zero).[4]

[4]We are grateful to an anonymous reviewer for suggesting that we use a continuous measure of social anxiety to reduce Type II error. To determine if this approach was appropriate, we used formulas reported in Tabachnick and Fidell (2001) to test whether the distribution of the SIAS/SPS was normal for the entire sample (Skewness = .458, $SE = 0.24$; Kurtosis = −1.12, $SE = 0.48$), and separately for men (Skewness = .30, $SE = 0.36$; Kurtosis = −1.42, $SE = 0.71$) and women (Skewness = .59, $SE = 0.33$; Kurtosis = −0.93, $SE = 0.64$). As the authors indicate, "conventional but conservative (.01 or .001) alpha levels are used to evaluate the significance of skewness and kurtosis with small to moderate samples" (p. 74). Using this conventional standard, the skewness of the SIAS/SPS was not significantly different from zero for the full sample ($p = .03$), or for the men ($p = .20$), or women ($p = .04$).

Of note, the results were very similar regardless of whether a continuous or dichotomous measure of social anxiety was used. All effects remained statistically significant using the dichotomous measure, except the Condition main effect ($p = .38$) and the Social Anxiety × Condition interaction ($p = .05$) both for activated-PA. As would be expected, the effect sizes tended to be larger with the continuous measure.

Measures

Social Anxiety

Severity of social anxiety symptoms was assessed with the SIAS, a 19-item measure of social interaction anxiety (i.e., distress with initiating and maintaining conversations) and the SPS, a 20-item measure of social observation fears (e.g., nervous when people are staring, concerns that people notice one's anxious symptoms). The SIAS/SPS has been shown to have excellent psychometric properties (e.g., Brown et al., 1997). In the present sample, the alpha coefficient for the SIAS/SPS was .97.

Affect Measures

Using a 4-point Likert scale, state anxiety was assessed with the 10-item State-Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983). The alpha coefficient for the STAI was .91 (averaged across conditions). State PA and NA were measured with an expanded version of the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). In addition to the 20 original items assessing activated-PA (e.g., joy) and NA (e.g., jittery), 11 additional items addressed deactivated-PA (e.g., serene, at ease, at rest) and deactivated-NA (e.g., bored, tired, drowsy; adapted from Barrett and Russell, 1998). Respondents completed the PANAS using a 5-point Likert scale. The respective alpha coefficients for the activated-PA, activated-NA, deactivated-PA, and deactivated-NA subscales were .91, .87, .81, and .85 (averaged across conditions) respectively. The 21-item Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996), with a 4-point Likert scale, assessed depressive symptoms. The alpha coefficient for the BDI-II was .92.

Curiosity

The 10-item State-Trait Curiosity Inventory-State (STCI-S; Spielberger, 1979) assessed the momentary experience of interest, wonder, the desire to probe deeper into things, and obtain new knowledge and experiences. The STCI has excellent psychometric properties (Kashdan, 2002; Peters, 1978). Respondents used a 4-point Likert scale. The alpha coefficient for the STCI was .86 (averaged across conditions).

Social Self-Efficacy

We used a modified version of the Social Self-Efficacy Questionnaire (SSEQ; Alden, Teschuk, & Tee, 1992) to measure participant expectations and social skill evaluations after each social task condition. Using a 10-point Likert scale, social self-efficacy was indexed by two items ("How well do you think you handled the interaction?"; How well do you feel you performed in comparison to other college students?"). The alpha coefficient for the SSEQ was .85 (averaging across conditions).

Interpersonal Attraction and Closeness

At the end of the interaction, participants completed the 7-item Interpersonal Judgment Scale (IJS; Byrne, 1971), wherein two items assessing the degree to which

individuals "get along" and "would like to work together" with their partner form the index of attraction. The IJS has been considered the gold standard to measure interpersonal attraction (e.g., Heimberg, Acerra, & Holstein, 1985). Respectively, the alpha coefficients for the participants and confederates IJS were .85 and .97.

To rate perceived closeness, participants completed the 1-item Inclusion of Other in the Self Scale (IOS; Aron A., Aron E. N., & Smollan, 1992), consisting of a series of seven overlapping circles. Respondents were asked to circle the pair that best describes their level of closeness to their interaction partner. The IOS has psychometric properties and predictive validity similar to more resource-intensive relationship measures (Aron et al., 1992; Aron & Fraley, 1999).

Attentional Focus

Composed of 5-item self-focus and external-focus subscales, the Focus of Attention Questionnaire (FAQ; Woody, Chambless, & Glass, 1997) was administered after each condition.[5] Using a 5-point Likert scale, the FAQ assesses attentional focus in social situations. The FAQ has shown sensitivity to self-focus manipulations (Woody, 1996) and treatment for SAD (Woody et al., 1997). The respective alpha coefficients for the self and external-focus subscales were acceptable at .80 and .65 (averaged across conditions).

Procedure

Preexperimental Measures

Participants were told that the study was about "empathic listening during social interactions." They completed the SIAS/SPS and BDI-II in a small office.

Social Interaction Task

After completing questionnaires participants were brought to another room and told to wait while another student participant was to join them. Unknown to participants, this individual was the confederate. Participants interacted with the trained confederate taking turns answering and asking a series of five questions. These questions gradually increased in the emotional content and level of self-disclosure necessary to answer them (see Aron, Melinat, Aron, Vallone, & Bator, 1997 for more details). The first and last task questions respectively, were "If you could invite anyone, living or dead, for dinner and conversation, who would it be and why?" and "When did you last cry in front of another person? By yourself?"

Each participant took part in both conditions. In the ST/SF condition, individuals answered the questions while a camera was directed at them. In the N/EF condition, individuals asked the questions and listened to the confederate's answers with the camera focused on the confederate. Confederates were trained to provide verbatim

[5]One of the items from the self-focus subscale was accidentally not included on this measure ("I was focusing on past social failures"). To produce scores that were comparable to other studies using the FAQ, the average item score from the remaining four items of the self-focus subscale was used to replace the missing item.

responses that were each approximately 1 min. An equal number of high and low-SA participants, and gender within groups, were assigned and counterbalanced to the order of tasks.

To create a uniform social task, the same male and female research assistants enacted confederate roles for all participants in same-sex interactions. Same-sex interactions were conducted because they are perceived as "qualitatively different" and less distressful than interactions with strangers of the opposite sex (e.g., Alden et al., 1992, p. 254). Same-sex interactions likely reduce some confounds affecting the anxiety-proneness of participants. Confederates were blind to group membership and trained to provide consistent friendly/neutral behavior. Training involved several sessions of mock interactions between confederates and graduate students, and feedback on their performance from one of the authors (T.K.).

Postassessment

At the end of each condition, the experimenter entered the room and asked participants and confederates to complete questionnaires according to "their feelings and state of mind during the prior interaction." Confederates completed the same questionnaires as participants for two reasons: (1) to maintain the deceptive ruse, and (2) to provide data on their perceptions of participants'. At the end of the task, participants were administered a memory task prior to debriefing. The memory task was comprised of 10 factual recall questions pertaining to the confederate's verbal script (e.g., "What did your partner find disturbing about immortality?").

Manipulation Checks

The FAQ was used to assess the success of the attention manipulation. Research assistants coded videotapes to evaluate confederate roles and behavior.

Videotaped Data

As a result of the experimental manipulation (i.e., camera focused on individuals answering questions), videotape data were available for the self-focus condition. Two research assistants' blind to hypotheses and group selection were trained to code videotapes of participants and confederates.[6] Observer ratings of participants' affect, social skills, and overt safety behaviors were based on the PANAS and modifications of the Social Performance Rating Scale (Fydrich, Chambless, Perry, Buergener, & Beazley, 1998) and the safety behavior questions of the Social Phobia Rating Scale (Wells, 1997). Safety behaviors (e.g., holding arms still, covering face) were assessed on an 8-point Likert scale. To examine the fidelity of confederate roles, trained coders used 7-point Likert scales for five items assessing the degree that confederates abided to scripts, were attentive to participants, were friendly, and had animation in their voice and posture.

[6]The recording quality of the videotapes in this study allowed for observers to produce reliable general ratings of social skill performance and affect. However, the distance between the camera, sound equipment, and participants made it difficult to discern quiet voices (typical of many high-SA individuals) and molecular body movements (e.g., eye gaze shifts).

Raters were trained via didactic sessions, sample videotapes, and feedback from the investigator (T.K.). All ratings were conducted independently. Interrater agreement was assessed using two-way mixed model (with measures of consistency) Intraclass Correlations (Shrout & Fleiss, 1979). Because of video quality, only 88 of 104 videos were rated. The two observers acceptably converged in rating social skills (.84), safety behaviors (.84), anxiety (.84), activated-PA (.82), activated-NA (.61), deactivated-PA (.72), and deactivated-NA (.79). For confederate behavior (using the total score), a coefficient of .73 was found. As for the convergent validity of affect ratings, there were positive correlations between observers and participants for activated-PA ($r = .48$), activated-NA ($r = .10$), deactivated-PA ($r = .14$), and deactivated-NA ($r = .13$). There is typically low convergence between different anxiety systems (Lang, Levin, Miller, & Kozak, 1983) and no clear standards for evaluating the validity of observer ratings.

RESULTS

Preliminary Analyses

Manipulation Checks

To validate our attentional focus manipulation, the FAQ was administered after each condition. Repeated-measures ANCOVAs were conducted for the FAQ-self and FAQ-external, controlling for order effects. Social anxiety was a significant predictor of the FAQ-self, $F(1, 95) = 55.86$, $p < .001$, $d = 1.53$, and FAQ-external, $F(1, 95) = 12.33$, $p = .001$, $d = 0.72$, such that higher social anxiety was associated with greater self and externally directed attention during the task. Significant Condition (ST/SF vs. N/EF) main effects were also found for the FAQ-self, $F(1, 95) = 66.33$, $p < .001$, $d = 1.67$, and FAQ-external, $F(1, 95) = 39.39$, $p < .001$, $d = 1.29$. Specifically, greater self-focused attention was found in the ST/SF ($M = 13.28$, $SD = 4.00$) compared to the N/EF condition ($M = 10.93$, $SD = 3.31$), and greater external-focused attention was found in the N/EF ($M = 13.34$, $SD = 2.86$) compared to the ST/SF condition ($M = 10.82$, $SD = 3.16$). The Social Anxiety × Condition interaction was not significant for the FAQ-self ($p = .19$) but a trend was found for FAQ-external ($p = .08$). The relationship between social anxiety and externally compared to self-directed attention has been given less attention in theoretical models and empirical research. To further understand the relationship among social anxiety, condition, and self-reported external-focus, we decomposed the near-significant trend for the FAQ-external subscale. Social anxiety predicted greater externally focused attention in the ST/SF condition, $F(2, 95) = 7.56$, $p = .001$, $R^2 = .14$, $d = 0.56$, and to a lesser extent, in the N/EF condition, $F(2, 95) = 3.22$, $p < .05$, $R^2 = .06$, $d = 0.37$. Overall, the manipulation was successful in altering self and externally direction attention in predicted directions.

We examined whether confederate behavior was uniform. Upon averaging independent raters' scores, the degree to which confederates abided by their scripts was 6.76 ($SD = .38$) on a 7-point scale. Social anxiety failed to predict any items of

confederate behavior ($ps > .15$). Thus, confederates engaged in similar degrees of animation and friendliness across participants.

Gender Effects

Women reported greater scores on the memory recall task after the interaction than men ($p < .05$) and independent raters found women to be higher in activated-NA, lower in activated-PA, and engage in more safety behaviors during the interaction than men ($ps < .05$). No other sex differences were found for dependent variables ($.12 < ps < .95$).

Preassessment Depressive Symptoms

Social anxiety was associated with greater depressive symptoms, $r = .65$, $p < .001$. Thus, to examine symptom specificity, follow-up analyses for significant experimental findings used the BDI-II as a covariate.

Zero-Order Correlations for Affect, Curiosity, Social Self-Efficacy, and Attentional Focus Measures

As reported in Table I, in the ST/SF and N/EF conditions, activated-NA was negatively correlated with deactivated-PA ($r = -.59$ and $-.36$, respectively), and activated-PA was negatively correlated with deactivated-NA ($r = -.51$ and $-.39$, respectively). These data support theory positing these two sets of constructs (activated-NA and deactivated-PA; activated-PA and deactivated-NA) to be bipolar dimensions (Barrett & Russell, 1998). Consistent with past research, activated-PA and NA had no association in either condition ($|r|s < .17$).

Main Analyses

Overview of Main Analyses

We expected social anxiety effects on subjective and objective social outcomes to be more pronounced in the ST/SF condition. To test this hypothesis, Condition × Sex Repeated Measures ANCOVAs were conducted for each outcome, with Social Anxiety as a between-participant factor and Order as a within-participant factor (i.e., covariate). Sex did not interact with other independent variables and was subsequently dropped.

Testing Social Anxiety × Condition Interactions

As shown in Table II, significant Social Anxiety main effects were found such that higher levels of social anxiety were associated with lower activated-PA ($p < .001, d = 0.68$), deactivated-PA ($p < .001$, $d = 1.42$), and social self-efficacy ($p < .001$, $d = 1.48$), and higher activated-NA ($p < .001$, $d = 1.50$), deactivated-NA ($p < .05$, $d = 0.43$), and state anxiety ($p < .001$, $d = 2.01$); a trend was found for lower curiosity ($p < .08, d = 0.36$). A Condition effect was found such that the ST/SF condition was associated with lower activated-PA ($p < .05$, $d = 0.41$). Significant

Table I. Zero-Order Correlations for Affect, Curiosity, Social Self-Efficacy, and Attentional-Focus Measures in the Two Experimental Conditions

	1	2	3	4	5	6	7	8	9
1. Activated-NA	1.0								
2. Deactivated-NA	.21* (.17)	1.0							
3. Activated-PA	−.08 (−.17)	−.39*** (−.51***)	1.0						
4. Deactivated-PA	−.36*** (−.59***)	−.07 (−.18)	.54*** (.59***)	1.0					
5. Anxiety	.71*** (.85***)	.05 (.09)	−.28** (−.29**)	−.68*** (−.79***)	1.0				
6. Self-efficacy	−.39*** (−.54***)	−.29** (−.41***)	.52*** (.56***)	.45*** (.62***)	−.59*** (−.59***)	1.0			
7. Curiosity	−.08 (−.15)	−.48*** (−.48***)	.77*** (.75***)	.42*** (.48***)	−.23* (−.26**)	.44*** (.47***)	1.0		
8. FAQ-self	.53*** (.48***)	.16 (−.06)	−.02 (.11)	−.28** (−.31**)	.53*** (.56***)	−.29** (−.19)	.02 (.10)	1.0	
9. FAQ-external	.18 (.24*)	.14 (−.04)	.13 (.06)	.12 (−.17)	.11 (.26**)	.02 (−.16)	.21* (.17)	.38*** (.43***)	1.0

Note. $n = 98$. Social threat/self-focused condition correlations are outside parentheses, whereas neutral/external-focus condition correlations are inside parentheses.

$*p < .05$. $**p < .01$. $***p < .001$.

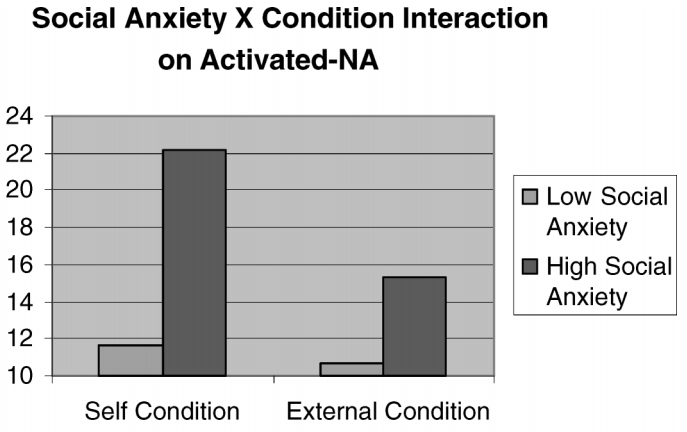
Table II. Means, Standard Deviations, and Repeated-Measures Analyses of Covariance (ANCOVA) for Effects of Social Anxiety, Experimental Condition, and Their Interactions on State Variables Controlling for Order Effects

	M (*SD*)				*F* tests (1, 95)		
	Low-SA		High-SA				
Variables	Self[a]	External[a]	Self[a]	External[a]	Social anxiety effects	Condition effects	Interaction effects
Activated-NA	12.62 (3.24)	11.30 (1.78)	19.22 (7.13)	14.93 (4.25)	53.47***	2.40	16.39***
Deactivated-NA	7.73 (2.92)	7.71 (3.09)	9.16 (3.24)	9.04 (3.27)	4.42*	.12	.00
Activated-PA	34.89 (8.50)	34.64 (7.81)	28.84 (7.53)	30.18 (7.36)	10.97***	4.03*	4.00*
Deactivated-PA	17.13 (3.96)	17.17 (3.85)	11.94 (3.17)	14.01 (3.18)	47.88***	2.83	11.79***
State-anxiety	15.95 (3.95)	14.66 (3.15)	24.51 (6.42)	19.73 (4.64)	96.33***	.89	15.46***
Self-efficacy	16.68 (2.87)	17.00 (2.45)	13.20 (3.14)	14.69 (2.53)	51.74***	3.25	9.61**
State-curiosity	28.83 (5.57)	29.68 (6.02)	26.41 (5.12)	28.14 (4.90)	3.15	.25	2.36

Notes. Descriptive statistics are derived from a median split on the continuous SIAS/SPS. All *F* tests controlled for order effects. All Social Anxiety effects (*F* tests) are based on the continuous SIAS/SPS.

[a]Self and external refer to experimental conditions.

*$p < .05$.**$p < .01$.***$p < .001$.



Notes. Social anxiety was transformed into a dichotomous variable based on -1 (Low Social Anxiety) and +1 (High Social Anxiety) standard deviations from the mean on the SIAS/SPS.

Fig. 1. Significant Social Anxiety × Condition Interaction effect on activated negative affect.

Social Anxiety × Condition interactions were found for activated-NA ($p < .001$, $d = 0.83$), activated-PA ($p < .05$, $d = 0.41$), deactivated-PA ($p < .001$, $d = 0.70$), state-anxiety ($p < .001$, $d = 0.81$), and social self-efficacy ($p < .005$, $d = 0.64$). The interaction for activated-NA is shown in Fig. 1; all of the interactions had the same pattern (see means in Table II). Consistent with predictions, the ST/SF condition had more pernicious effects for individuals with greater social anxiety.[7]

To evaluate the nature of these interactions, a series of simple main effect analyses were conducted by dichotomizing Social Anxiety using a median split. For activated-NA, the ST/SF condition had a greater effect on high compared to low-SA individuals, $F(1, 96) = 36.63$, $p < .001$, $d = 1.24$; group differences were also found in the N/EF condition, $F(1, 96) = 31.98$, $p < .001$, $d = 1.15$. For state anxiety, the ST/SF condition had a greater effect on high compared to low-SA individuals, $F(1, 96) = 65.16$, $p < .001$, $d = 1.65$; group differences were also found in the N/EF condition, $F(1, 96) = 41.05$, $p < .001$, $d = 1.31$. For activated-PA, the ST/SF condition had a greater effect on high compared to low-SA individuals, $F(1, 96) = 13.68$, $p < .001$, $d = 0.75$; group differences were also found in the N/EF condition, $F(1, 96) = 8.38$, $p < .01$, $d = 0.59$. For deactivated-PA, the ST/SF condition had a greater effect on high compared to low-SA individuals, $F(1, 96) = 50.01$, $p < .001$, $d = 1.44$; group differences were also found in the N/EF condition, $F(1, 96) = 19.23$, $p < .001$, $d = 0.90$. For social self-efficacy, the ST/SF condition had a greater effect on high compared to low-SA individuals, $F(1, 96) = 32.78$, $p < .001$, $d = 1.17$; group

[7] A modified Bonferroni correction (Holm, 1979) was applied to control for potentially inflated Type I error rates. The Holm method improves upon standard Bonferroni corrections, which invite excessive Type II error rates (Jaccard & Guilamo-Ramos, 2002). With this technique, Social Anxiety × Condition interaction effects remained for activated-NA, deactivated-PA, state-anxiety, and social self-efficacy. Additionally, Social Anxiety main effects remained for activated-NA, activated-PA, deactivated-PA, state-anxiety, and social self-efficacy. Thus, using these adjusted Bonferroni corrections, nearly all findings were retained.

differences were also found in the N/EF condition, $F(1, 96) = 21.02$, $p < .001$, $d = .94$. Overall, both conditions led to greater emotional and cognitive disturbances for high compared to low-SA individuals. However, on the basis of effect sizes, differences were consistently larger in the ST/SF condition (i.e., significant Social Anxiety $\times$ Condition interaction effects).

Attentional Focus as a Potential Mediator of Social Anxiety $\times$ Condition Interaction Effects

Using the steps outlined by Baron and Kenny (1986), we examined the role of self-focus as mediators of Social Anxiety $\times$ Condition interaction effects on various affective and cognitive outcomes (see Table II for significant interaction effects). On the basis of the results of our prior analyses, and fit with relevant theory (Rapee & Heimberg, 1997), we confined our examination to the potential mediation effect of self-reported self-focus in the ST/SF condition.

At Step 1, social anxiety was a significant predictor of self-reported self-focused attention ($p < .001$). At Step 2, self-reported self-focused attention had significant relationships with activated-NA, deactivated-PA, state anxiety, and social self-efficacy (see Table I). Thus, these were the outcomes under examination. At Step 3, social anxiety was a significant predictor of activated-NA, $F(1, 96) = 46.15$, $p < .001$, $d = 1.39$, state anxiety, $F(1, 96) = 84.70$, $p < .001$, $d = 1.88$, activated-PA, $F(1, 96) = 12.43$, $p = .001$, $d = 0.72$, deactivated-PA, $F(1, 96) = 60.52$, $p < .001$, $d = 1.59$, and social self-efficacy, $F(1, 96) = 47.67$, $p < .001$, $d = 1.41$. Finally, we statistically controlled for self-reported self-focused attention. After controlling for self-focused attention, the predictive utility of social anxiety was reduced for activated-NA, $F(1, 95) = 20.44$, $p < .001$, $d = 0.93$, state anxiety, $F(1, 95) = 41.45$, $p < .001$, $d = 1.32$, and deactivated-PA, $F(1, 95) = 44.91$, $p < .001$, $d = 1.38$. In contrast, there were no differences for social self-efficacy, $F(1, 95) = 46.37$, $p < .001$, $d = 1.40$, and on the basis of effect size, the impact of social anxiety on activated-PA increased, $F(1, 95) = 27.12$, $p = .001$, $d = 1.07$.

We also used the Sobel test of mediation (described in Baron & Kenny, 1986) to examine whether indirect paths (in the ST/SF condition) from Social Anxiety to each dependent variable through self-focused attention were significantly different than zero. Using this method, self-focused attention explained part of the relation between Social Anxiety and activated-NA, $z = 2.40$, $p = .01$, state anxiety, $z = 2.84$, $p = .004$, and there was a trend for deactivated-PA, $z = 1.79$, $p = .07$. In contrast, there were no mediation effects for social self-efficacy and activated-PA. These data suggest a partial mediation effect for self-focused attention for three of five outcomes.

Testing Social Anxiety Effects on Participant Interpersonal Ratings and Memory

In contrast to prior analyses, interpersonal ratings and memory recall were only evaluated at the end of the entire interaction. Using linear regression equations, high-SA participants found interaction partners to be less appealing than low-SA participants, $F(1, 96) = 4.62$, $p < .05$, $R^2 = .05$. After controlling for depressive

symptoms, this finding was no longer significant. Unexpectedly, social anxiety failed to predict ratings of perceived closeness ($p = .19$) or memory of interpersonal information ($p > .50$). Sex did not interact with social anxiety in predicting outcomes.

Testing Social Anxiety Effects on Observer Ratings

Social anxiety failed to predict confederate ratings of attraction ($p = .25$) but there was a trend for perceived closeness ($p = .08$) such that confederates felt closer to low compared to high-SA participants. The camera was only positioned on individuals during the ST/SF condition, providing the only data for behavioral coding. Although a limitation, we would anticipate the greatest social anxiety effects for the ST/SF condition. Social anxiety failed to predict trained observer ratings of social skills or safety behaviors (ps $> .15$), activated-NA, deactivated-NA, or activated-PA (ps $> .40$). The only significant finding was that observers rated high-SA individuals as lower in deactivated-PA, $F(1, 81) = 7.64$, $p < .01$, $R^2 = .09$. Sex did not interact with social anxiety in predicting outcomes.

Secondary Analyses

Testing the Specificity of Social Anxiety and Social Anxiety × Condition Interaction Effects

Follow-up analyses, controlling for depressive symptoms, were conducted for all significant Social Anxiety and Social Anxiety × Condition interaction effects. Social Anxiety main effects remained statistically significant for activated-NA ($p < .001$), activated-PA ($p < .05$), deactivated-PA ($p < .001$), state anxiety ($p < .001$), and social self-efficacy ($p < .001$); the effect for deactivated-NA was no longer significant ($p = .13$) and the trend for curiosity was drastically reduced ($p = .76$). Social Anxiety × Condition interactions remained statistically significant for activated-NA ($p < .001$), deactivated-PA ($p < .005$), state anxiety ($p < .001$), and social self-efficacy ($p = .005$); the interaction effect for activated-PA was no longer significant ($p = .15$).

DISCUSSION

This study explored the effects of social anxiety and social threat/self-focused attention on affect, curiosity, and social self-efficacy during a reciprocal self-disclosure task. Results indicated that (1) high-SA individuals reported greater NA, and lower PA and social self-efficacy than low-SA individuals; (2) nearly all social anxiety differences were amplified by the ST/SF condition; (3) social anxiety effects were generally absent on observed behavior and intimacy outcomes; (4) most social anxiety findings remained significant after controlling for depressive symptoms; and (5) there was some evidence for the role of self-focused attention as a mediator of interaction effects.

Affective, Social Cognitive, and Curiosity Disturbances in Social Anxiety

Affect

Our data replicated and extended prior work finding SAD to be related to both dispositional NA and PA (Brown et al., 1998; Watson et al., 1988). First, we investigated affect generated during the course of a social interaction. Second, affect was measured according to a contemporary model emphasizing both valence and activation, allowing for a systematic examination of affective dimensions. Third, we examined a theoretically plausible mechanism that might contribute to affective differences between high and low-SA individuals, namely self-focused attention. Finally, we examined symptom specificity.

Our results indicated that compared to low-SA, high-SA individuals reported greater activated and deactivated-NA and less activated and deactivated-PA during a social interaction. Additionally, trained observers were able to discern high-SA individuals as being lower in deactivated-PA than their low-SA peers. As will be discussed, self-focused attention partially mediated many of these findings and controlling for depressive symptoms, nearly all findings were specific to social anxiety.

Social Self-Efficacy

Our data on nonclinical individuals extends prior work showing that individuals with SAD tend to discount their social performance, even when interactions are manipulated to be objective successes (Alden & Wallace, 1995). Additionally, we conducted within-participant analyses. We found an interaction effect such that high-SA individuals reported lower self-perceptions of social competence than low-SA individuals in both conditions. However, these differences were greater in the ST/SF compared to the N/EF condition. Thus, even though they were interacting with the same individuals in both conditions with only a few minutes between conditions, negative self-appraisals were amplified by social threat cues.

Curiosity

Similar to prior work (Kashdan, 2002, in press-b; Plant & Ryan, 1985), there was a trend for high compared to low-SA individuals to report less interpersonal curiosity. Yet, social threat cues failed to amplify curiosity differences between high and low-SA individuals, and effects were not specific to social anxiety. Because this study is the first to examine the social anxiety–curiosity relationship in a dyadic interaction, future studies will be needed to confirm these data.

Mediational Role of Self-Focused Attention

Our data suggest that self-focused attention may contribute to the affective disturbances experienced by high-SA individuals in social interactions. Other studies have made similar claims using experimental tasks found to manipulate self-focused attention (e.g., Woody, 1996). However, this was one of the first studies to conduct a full mediational test of self-focused attention to account for subjective outcomes

following a social interaction. Self-reported self-focus was found to partially mediate Social Anxiety × Condition effects for activated-NA, state anxiety, and deactivated-PA; it failed to mediate effects on activated-PA and social self-efficacy. The process of self-focused attention appears to be an important component of the emotional dysfunction of high-SA individuals in social situations. Nonetheless, because moderate-sized social anxiety effects remained even after accounting for self-focused attention, there appear to be additional unexamined causal mechanisms in perceived social-threat situations.

These findings fit with prevailing models that posit self-focused attention to be one of the causal mechanisms of psychological distress and impairment in social anxiety (Clark & Wells, 1995; Hartman, 1983; Rapee & Heimberg, 1997). It is proposed that the self-regulation patterns of high-SA individuals, including monitoring (and inhibiting) behavior and signs of physiological arousal for fear of being rejected or humiliated, affects their social confidence in being able to obtain desired outcomes (e.g., cultivate friendships), and impairs their ability to hold up their end of interactions, be engaged, and enjoy themselves. These processes can be expected to induce negative subjective experiences and interfere with social engagement, reducing positive subjective experiences. Consistent with this perspective, we found high-SA individuals to rate their partners as less appealing than low-SA individuals.

Interpersonal Disturbances Inherent to Social Anxiety

In contrast to subjective experiences, trained observer and interaction partner ratings generally failed to differentiate high and low-SA groups on interpersonal attraction and closeness, social skills, or affect (except observer ratings of deactivated-PA). Prior work is mixed as some studies found no behavioral differences between high and low-SA individuals (Rapee & Lim, 1992; Woody, 1996), whereas others have found that high-SA individuals exhibit general social skill deficits (Turner, Beidel, Cooley, & Woody, 1994; Walters & Hope, 1998). How do we resolve the discrepancy between the unpleasant subjective experiences reported by high-SA individuals and the failure for observers to differentiate high and low-SA individuals' behavior and affect? The discordance between subjective and objective ratings may be a consequence of the difficulty in ascertaining the psychological underpinnings of others' behaviors (e.g., Hodes, Cook, & Lang, 1985; Lang et al., 1983). An individual may nod, smile, and make strong eye contact because they are positively engaged by an interaction or because they fear negative feedback from their partner (i.e., obsequiousness). If they are acting to avoid rejection, they are likely to produce minimally "socially appropriate" behaviors to appear friendly while deflecting self-directed attention. Although individuals may have visceral emotional experiences, objective observers are limited to using expressive behaviors as heuristics of others' discrete, subjective experiences. For example, trembling hands can be used as a proxy for general anxiety, the reddening of facial blood vessels as a proxy for shyness or embarrassment, or watching someone "pull up the corners of their mouths and crinkle the skin alongside their eyes" (Miller, 1999, p. 408) as a proxy for happiness. Future research can further elucidate the motives and self-protective strategies that underlie high and low-SA individuals' behavior in social-evaluative situations.

Despite these caveats, the present paradigm involved a uniform procedure to ensure that all participants received the same quantity and quality of attention and information. Independent ratings of confederate behavior confirmed the strong internal validity of this procedure. We found that whether participants began the interaction by asking or answering questions had virtually no impact on outcomes. Our data suggest that this paradigm is a viable means of furthering our understanding of the social interchanges within and between high and low-SA individuals.

Specificity of Social Anxiety Effects

Even after controlling for depressive symptoms, social anxiety remained uniquely associated with activated and deactivated NA and PA, state anxiety, and social self-efficacy during the interaction. With the exception of activated-PA, all Social Anxiety × Condition interaction effects remained significant. Of note, these were stringent statistical tests, as there is a great deal of symptom overlap between social anxiety and depression. Testing the specificity of social anxiety effects removes substantive variance innate to the construct of social anxiety.

Our data suggest that high NA and low PA, similar to depression (e.g., Burns & Eidelson, 1998), characterize the affective profile of high-SA individuals. Perhaps of greater importance, social threat cues appear to amplify deficits in positive subjective functioning in high-SA individuals. Dovetailing with other work finding social anxiety to be uniquely, negatively related to positive subjective experiences (Kashdan, 2002, in press-b), this appears to be an area worthy of further pursuit. For example, what are the psychosocial costs of high-SA individuals being low in PA? Despite a fundamental need to relate to others (Baumeister & Leary, 1995), deficits in pleasant responses during social activity can be expected to lead to insufficient incentives for interaction partners. It can be speculated that high-SA individuals, experiencing low interpersonal PA, are unlikely to reciprocate the responsiveness and engagement that reinforces the development of intimacy, social support, and relationships. All of these domains are inextricably woven with living a satisfying and meaningful life (e.g., Myers & Diener, 1995).

Caveats and Suggestions

Despite the effectiveness in our experimental manipulation of focus of attention, the procedure also directly manipulated self-disclosure: the "self-focus" condition involved the camera focused on the participant while the participant answered personal questions, whereas the "external focus" condition involved the camera focused on the confederate while the participant asked scripted questions. Because of an ill-defined manipulation, we were more comfortable labeling our conditions by social threat and attentional focus. Further there has been only one previously published study using an external-focus manipulation in a high-SA sample (Wells & Papageorgiou, 1998). In contrast to the modal use of self-focus compared to neutral conditions, future research might benefit from more precise self- and external-focus manipulations that are compared in the same sample with baseline assessments. Despite a large body of experimental research purportedly assessing the effects of self-focused

attention on social anxiety, it remains to be seen whether the causal mechanisms are self-focused attention, the act of self-disclosure, elevated social evaluative fears, or other components of social activity. In our study, there was some evidence for self-focused attention as a mediator of relationships between social anxiety and affective disturbances. This is one of the first studies to conduct this full mediation test.

Several other methodological improvements may provide better tests of the relationships under study. In particular, future studies should assess baseline affect and attentional focus. This study used general quantitative survey indices of emotional adjectives, social skill ratings, and a single-item measure of interpersonal closeness. Nonetheless, as one of the first full examinations of the impact of social anxiety on different affective dimensions, we believe our findings add merit to further study using subjective, behavioral, and physiological indices in social and nonsocial contexts. Improved measurement of complex mechanisms such as direction of attention, safety behaviors, mental self-representation, and emotional regulation can enhance our understanding of the psychopathology of social anxiety. Yet, our design enabled us to make within and between participant comparisons to explore differences in interpersonal outcomes during a dyadic interaction. As for the failure to find social anxiety effects on postinteraction memory, using 10 factual questions relating to the confederate's verbal script may not have tapped the most relevant aspects of memory. A better assessment would address both verbal and nonverbal information from the confederate and participant. Yet, at present, several studies have failed to find memory effects among persons with excessive social anxiety, irrespective of recall or recognition format, or stimuli (see Heinrichs & Hofmann, 2001 for review).

It is possible that high-SA individuals are primarily motivated to avoid their worst fears (i.e., rejection, embarrassment) at the expense of seeking and obtaining potential positive outcomes such as positive emotional responses, laughter, inspiration, and the development of relationships. It is hoped that the present investigation initiates future work in the potentially fruitful study of hedonic deficits in excessively SA individuals. The use of structured experimental and naturalistic methodologies can improve our understanding of the interface between emotions, motivation, and cognitive processes in socially anxious individuals.

ACKNOWLEDGMENTS

This study was supported by grant from the National Institute of Mental Health awarded to Todd B. Kashdan (F31-MH63565). We thank Larry Hawk for his insightful comments on an earlier version of this paper, and Adam Koniak, Donna Smith, and Leanne Hamblin for their able assistance in conducting this research.

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