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Interpersonal Consequences of Social Anxiety

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The behavioral manifestations of social anxiety may have implications for social outcomes. Unfortunately, little is known about how anxiety shapes social interaction. The present study examined social interactions in dyads consisting of either 2 nonsocially anxious (NSA) individuals or 1 socially anxious (SA) and 1 NSA individual. Behavior, self-reported affect, and perceptions were examined. In comparison with the interactions of NSA pairs, high levels of fidgeting, poor reciprocity of smiling behavior, more self-talk, and more frequent reassurance seeking and giving characterized interactions between SA and NSA participants. Both SA participants and their NSA partners rated their interactions as being less smooth and coordinated than did participants in NSA–NSA dyads. In addition, SA participants' reassurance seeking and self-talk correlated negatively with partner positive affect and perceptions of interaction quality. The authors discuss self-focused attention and the interpersonal consequences of social anxiety.

Keywords: social anxiety, social interaction, emotion, sequential analysis

The anecdotal observation that nonanxious people experience interactions with socially anxious people as "odd" or "off" (Barlow, 2002) has spurred a body of work aimed at understanding the social consequences of social anxiety. Although this work has generated valuable knowledge about the nature of social anxiety, much of it has focused on the acute arousal and anxiety-related cognitions experienced by people with the disorder. However, individuals with social anxiety worry about social outcomes, and these worries manifest in behavior (Leary & Kowalski, 1995a). Thus, the intrapersonal aspects of social anxiety have *inter*personal consequences, about which much less is known. Insofar as the experience of interaction affects how relationships develop, behavioral manifestations of social anxiety may have far-reaching implications for social outcomes.

There is general agreement that social anxiety is related to alterations in behavior during interaction (Wenzel, Graff-Dolezal, Macho, & Brendle, 2005). Nonetheless, the ways in which behaviors change, along with their causes and consequences, are still debated (Baker & Edelmann, 2002). The concept of self-focused attention (see Spurr & Stopa, 2002), which manifests in the intrapersonal experience of social anxiety (Clark & Wells, 1995), provides a useful framework for predicting how acute anxiety may be revealed in behavior.

Evidence suggests that self-focused attention and anxious arousal are coupled such that increases in anxiety correspond with increases in self-focus. Specifically, anxious arousal during interaction stems from self-presentational concerns, including the idea that a negative evaluation of one's self is forthcoming or that signs of anxiety such as shaking or sweating may be noticeable (e.g., Cartwright-Hatton, Tschernitz, & Gomersall, 2005; Clark & Wells, 1995; Kocovski & Endler, 2000; Wells & Papageorgiou, 1998). These concerns lead to increases in self-focused attention (Cheek & Briggs, 1990; Kowalski & Leary, 1990; Leary, Kowalski, & Campbell, 1988) that predict participants' anxiety and affect across interactions (Woody, 1996). As self-focused attention rises, the ability to concentrate on social interaction may decline, leading to disjointed social performances (Clark & McManus, 2002; Perowne & Mansell, 2002; Rapee, 1993).

Although individuals with social anxiety wish to avoid self-disclosure (Clark & Wells, 1995), it may be the case that self-focus interferes with this desire, particularly in unstructured situations in which participants' behavior is not guided by explicit rules. For example, studies have shown that anxious individuals disclose less in structured situations designed to elicit disclosure (DePaullo, Epstein, & LeMay, 1990; Meleshko & Alden, 1993), although naturalistic studies have failed to replicate the finding (Reno & Kenny, 1992; Thompson & Rapee, 2002). One reason for the discrepancy may be that shy or anxious individuals are less likely to direct conversation during naturalistic social interactions (Pilkonis, 1977). Reticence to do so may have paradoxical effects: Those who fail to direct conversation may find themselves answering more questions and revealing more personal information.

Another consequence of self-focused attention may be increased awareness of anxious arousal. To allay this anxiety, socially anxious individuals report engaging in actions designed to forestall the occurrence of feared social outcomes (Clark & Wells, 1995; Wells, Clark, Salkovskis, & Ludgate, 1995). One such anxiety regulation strategy may be to engage in "checking" behavior to ascertain the likelihood of a feared outcome (Mennin, Heimberg, Turk, & Fresco, 2002). Excessive worry, along with the perception that outcomes are controllable, both elements of social anxiety (e.g.,

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Leary & Kowalski, 1995b), has been related to compulsive checking in generalized anxiety and obsessive-compulsive disorders (Mennin et al., 2002). Similar behavior may occur in social anxiety, although this idea has not yet been examined. If so, one might expect individuals with social anxiety to seek affirmation or reassurance at higher rates than nonanxious individuals.

Awareness of one's high negative and low positive affect, an aspect of self-focused attention (Flory, Raikkonen, Matthews, & Owens, 2000), may impact nonverbal behavior. In particular, individuals with social anxiety may inadvertently communicate the distress of which they are so keenly aware (Keltner & Haidt, 1999). Fidgeting, for example, signals psychomotor agitation (Okazaki, Liu, Longworth, & Minn, 2002) and may be elevated among individuals with social anxiety. Frowns also indicate negative affect (Ekman, 1992) and may, therefore, be elevated. Moreover, general anxiety is associated with reductions in smiling (Field et al., 2005; Yovetich, Dale, & Hudak, 1990). Although studies have found that smiling is "adequate" among individuals with social anxiety (Baker & Edelmann, 2002), mixed results have been found among shy individuals (Pilkonis, 1977). Acute awareness of one's reduced positive and elevated negative affect (Hirsch, Meynen, & Clark, 2004; Kashdan & Roberts, 2004) suggests reduced smiling, particularly with respect to smiles of pleasure (Ekman, 1992) rather than the polite smiles associated with sociability (Keltner & Haidt, 2001). These types of smiles and their relationship to social anxiety have not been carefully disambiguated in the literature.

Taken together, the behaviors individuals communicate may play an important role in shaping an interaction as well as more distal social outcomes. Studies of negative feedback solicitation hint at how this process may work. Individuals who solicit more negative feedback from their social partners also receive more of it (Casbon, Burns, Bradbury, & Joiner, 2005), along with more negative social evaluations (Joiner & Metalsky, 1995; Katz & Joiner, 2001). The effects of self-focus in social anxiety may be similar, leading to subtle reinforcement of anxiety-related cognitions. Studies suggest that willingness to engage in a future interaction with someone is related to that individual's interpersonal behavior, including smiles (LaFrance & Hecht, 1999; Palmer & Simmons, 1995), communication of positive emotion (Berry & Hansen, 1996), and the degree to which interaction is perceived as being smooth and coordinated (Cappella, 1997). If the presence of social anxiety disrupts these aspects of social behavior, individuals with social anxiety may inadvertently provoke the negative perceptions they seek to avoid.

In the present study, we sought to address the interpersonal consequences of social anxiety by asking nonsocially anxious (NSA) individuals to interact with either an NSA or a socially anxious (SA) conversation partner. We expected SA participants to ask fewer questions and to engage in more frequent self-focused talk. Furthermore, we expected that self-talk would be related to partner questions for SA but not NSA participants. We also predicted that SA participants would engage in more frequent reassurance-seeking or support solicitations, which their conversation partners were expected to provide, and would display less positive affect (e.g., smiles) and more negative affect (e.g., fidgeting and frowns).

Dyads that included SA participants were expected to rate their interactions as lower in quality than dyads that did not. We predicted that self-reported affect would depend on partner anxiety status. Because most people enjoy social interaction (Berry & Hansen, 1996), we hypothesized that participants in NSA dyads would report an increase in positive affect from pre- to postinteraction, with little change in negative affect. Participants in mixed-anxiety dyads were expected to report a rise in negative affect from pre- to postinteraction, with little change in positive affect. Finally, we expected that affect and ratings of interaction quality would be related to partner behavior.

Method

Participants

Participants ($n = 120$) were recruited from a large undergraduate sample ($N = 2{,}754$) on the basis of their scores on the Interaction Anxiousness Scale (Leary & Kowalski, 1993). Individuals scoring in the top and bottom 20th percentile of the sample made up the SA ($n = 30$) and NSA ($n = 90$) groups, respectively. Study participants additionally completed the Social Phobia and Anxiety Inventory (SPAI; Turner, Beidel, Dancu, & Stanley, 1989). Relative to NSA participants, SA participants had significantly higher SPAI scores, $F(1, 118) = 217.06$, $p < .001$ (see Table 1), that fell within the SPAI clinical range (Turner et al., 1989).

Thirty NSA women were randomly paired with either an SA ($n = 15$) or NSA ($n = 15$) female partner, likewise for men. Together, there were 30 SA–NSA dyads and 30 NSA–NSA dyads. Participant characteristics appear in Table 1.

Procedure

Potential participants were recruited by phone for a study of "how people feel when they get to know one another." They anticipated interacting twice with the same partner. On arrival, the experimenter introduced participants and ascertained that they were strangers. Participants completed a short assessment of current affect and were escorted to a quiet reading lounge for the interaction. A hidden camera recorded behavior. With the permission of the university's institutional review board, we did not inform participants of the videotaping procedures until study completion. Participants were instructed to "get to know" one another and were left alone for the 5-min interaction period. When the time had elapsed, the experimenter ended the interaction and distributed questionnaires. To ensure independence of ratings, the experimenter had participants complete questionnaires in separate rooms. Participants were then debriefed, informed about the videotaping procedure, and given the opportunity to provide fully informed consent. No participant declined consent.

Questionnaires

Self-report data consisted of the Positive and Negative Affect Schedule (PANAS) and the Quality of Interaction (QI) scale. The PANAS includes 10 positive affect words (e.g., attentive, interested) and 10 negative affect words (e.g., jittery, upset), rated on a 5-point Likert scale (1 = *not at all*; 5 = *very much*) for the degree to which participants "currently feel" each emotion (Watson, Clark, & Tellegen, 1988). It has well-established psychometric properties (Crawford & Henry, 2004). This measure was collected

Table 1
Participant Demographics, Anxiety Ratings, and Personality Characteristics

Variable	Nonsocially anxious (NSA)			Socially anxious (SA)		
	n	*M*	*SD*	*n*	*M*	*SD*
Participant	90			30		
Men	45			15		
Women	45			15		
Age (years)		18.75	0.82		18.97	1.05
Ethnicity						
Caucasian	48			14		
Asian	26			12		
Middle Eastern	4			2		
Latino/Latina	5			1		
Indian	3			1		
African American	4			0		
IAS		13.81	4.64		48.09	4.29
SPAI (Social Phobia subscale)[a]		25.91	18.96		86.61	20.50

Note. Mean differences across groups on the Interaction Anxiousness Scale (IAS) and Social Phobia and Anxiety Inventory (SPAI) were statistically significant as expected ($p < .001$). No other differences existed.
[a] Means from the SPAI normative samples as reported in Turner et al. (1989) for clinically identified students = 72.2 and for adults with social phobia = 94.0.

both immediately before and after the interaction. The QI, adapted from Berry & Hansen (1996), measures perceptions of the smoothness and coordination of interactions and satisfaction therewith (e.g., "To what degree did you find the interaction enjoyable?" "To what degree did you feel the interaction was awkward or strained?"). The QI is rated on an 8-point scale (1 = *not at all*; 8 = *very much*), and reliability analyses in the present sample showed that the measure had good internal consistency ($\alpha = .82$).

Coders

Eight research assistants independently coded either verbal (three coders) or nonverbal behavior (five coders) from videotapes of the study sessions. All were naive to study hypotheses and participants' anxiety status. Prior to coding study data, verbal and nonverbal behavior coders were trained to 95% agreement on a set of sham interactions. As a check on posttraining reliability, each coder independently coded the same three pilot interactions. Verbal behavior coders achieved 94% agreement, and nonverbal behavior coders achieved 91% agreement. We examined agreement by having two verbal behavior coders overlap their coding for half the sessions (30 sessions, both participants). Agreement was assessed among nonverbal behavior coders in similar fashion.

We used onset times from a time code stamped on the tape to link dyad members' behavior. The codes for each verbal behavior (described below) were defined as mutually exclusive—that is, no verbal code could occur simultaneously with another verbal code. Nonverbal facial behaviors were also considered mutually exclusive, as were hand movements (described below). Behaviors were coded in 1-s time intervals. Coders identified which behavior was most prominent during each second, including episodes of silence, rest, and "other" behaviors not of theoretical interest to the present investigation. Thus, each second of each participant's interaction included a code for one verbal behavior, one nonverbal facial behavior, and one hand behavior. As there were no gaps in recording, the offset time of one behavior was considered to have happened during the second prior to the onset of the new behavior (for a complete description of this method of coding and recording data, see Bakeman & Quera, 1995).

Verbal Coding

Among the many verbal behaviors participants generated, we focused on four a priori hypotheses: reassurance seeking (RS); empathy and support (ES); questions asked (Q); and information sharing, which we subdivided into talk about the self (ST) or general/non–self-talk (GT). Verbal coders additionally rated episodes of silence. RS included complaints (e.g., "These research studies make me kind of nervous"); apologies (e.g., "I'm sorry for interrupting"; "I didn't really mean that"); and direct requests for advice (e.g., "What would you do?"), support (e.g., "Isn't that awful?"), or agreement (e.g., "Don't you think so too?"). ES included behaviors such as empathetic comments (e.g., "I feel the same way"), defending (e.g., "I would have done the same thing"), and advice (e.g., "You should go talk to the professor about that"). Q involved information solicitation (e.g., "Where are you from?" "Did you see the game last night?"). ST included information sharing with the self as the primary focus (e.g., "I'm living in the dorms this semester"; "I have three brothers"), whereas GT was general information not related to self (e.g., "Professor Covington is the teacher for Psych 1 this semester"; "I heard that Psych 192 is one of the best classes on campus"). Verbal behavior was absent during episodes of silence.

Tests of interrater agreement were conducted on the 30 sessions that had been coded by two raters. Cohen's kappa coefficients ranged from .72 to .96. Coders demonstrated acceptable reliability as evidenced by kappas of at least .70 (Bakeman & Gottman, 1997).

Nonverbal Coding

Coders examined participants' faces for polite smiles (smiles lacking involvement of the eye region), pleasurable smiles (smiles

involving changes in the apparent shape of the eye), and frowns (brow furrowing with or without involvement of the mouth). They also coded participants' hands for fidgeting. Other hand and face behaviors along with episodes of rest were not considered relevant to the present study and are not discussed. As with verbal behavior, two raters coded half the sessions to check agreement. Kappas ranged from .85 to .94.

Data Analysis

The design included three participant types: NSA participants who interacted with other NSA participants (NSA with NSA), NSA participants who interacted with SA participants (NSA with SA), and SA participants (SA). Participant types were nested within dyads that were of two dyad types: dyads consisting of two NSA participants (NSA–NSA) or dyads including one SA and one NSA participant (SA–NSA). Finally, because individuals interacted within dyads, conversation partners' experiences during interaction were not statistically independent, creating a third source of variance. Although this variance was not of theoretical interest in the present investigation, it was necessary to partition it out of the statistical model so that participant type differences could be tested, independent of the random effects associated with dyadic pairing. These analyses, mathematically equivalent to the intraclass correlation (see Kenny, 1996; Kenny & la Voie, 1985), are not reported here.

Hypotheses predicting differences in behavior and self-report measures were tested using the analysis of variance model discussed in Kenny and la Voie (1985) to control dyad-level interdependence. We further examined significant omnibus tests of participant type for differences between the three levels of this variable by using Scheffé's correction for Type I error. To more closely examine predictions about social reciprocity, we examined sequences of verbal and nonverbal behaviors at the dyad level for the presence of reciprocal interaction patterns (see Bakeman & Gottman, 1997), such as one participant smiling in response to the other's smiles. Chi-square analyses measured the degree to which nonverbal sequences across dyad types fit an expected model.

Results

We predicted that SA participants would ask fewer questions and produce more self-focused talk, which was in turn expected to relate to questions asked by their partners. In addition, we predicted that SA participants would seek, and their partners would provide, more reassurance. Except as noted, descriptive statistics and analyses (results and *p* values) are reported in Table 2.

Conversation

Overall, participants in SA–NSA dyads were silent for a greater proportion of the interaction, and NSA–NSA dyads engaged in more frequent episodes of general talk. Consistent with prediction, SA participants' verbal behavior consisted of more frequent episodes of self-talk (ST), relative to either of the other participant groups. SA participants also asked fewer questions than did their partners, although SA participants did not differ from participants in NSA–NSA dyads in number of questions asked. It is possible that questions elicited less information in SA–NSA dyads, as participants in NSA–NSA dyads tended to talk longer after each

Table 2
Verbal and Nonverbal Behavior

	NSA–NSA dyads		NSA–SA dyads							
	NSA with NSA (n = 60)		NSA with SA (n = 30)		SA (n = 30)		Dyad type difference		Participant type difference	
Variable	*M*	*SD*	*M*	*SD*	*M*	*SD*	*F*	*p*	*F*	*p*
Total silence	.40	.10	.42	.09	.46	.10	**4.30**	**.04**	1.98	.16
Verbal behavior										
Self-talk	15.82	4.84	15.97	5.91	19.46	7.37	2.59	.11	**5.75**	**.02**[a,b]
General talk	10.74	4.74	9.52	4.59	7.79	5.22	**4.50**	**.04**	1.64	.21
Questions asked	11.74	4.86	14.76	6.74	11.46	5.43	2.11	.15	**5.00**	**.03**[c]
Reassurance seeking	2.18	1.66	2.72	2.20	4.64	2.92	2.34	.13	**5.88**	**.02**[a]
Empathy and support	0.92	0.76	3.14	1.39	0.82	0.61	**4.15**	**.05**	**9.96**	**< .01**[c,d]
Facial behavior										
Polite smiles	10.66	3.51	10.98	4.32	13.93	4.09	3.12	.08	**8.93**	**< .01**[a,b]
Pleasant smiles	6.08	3.76	5.65	3.14	7.15	3.32	0.86	.36	0.49	.48
Frowns	2.50	3.69	1.96	2.78	1.22	1.69	1.80	.19	0.96	.33
Hand behavior										
Fidgeting	.24	.18	.31	.21	.34	.24	**4.80**	**.03**	0.18	.67

Note. Bold type indicates significant differences. Total silence and fidgeting are reported as proportions of total interaction time because the frequencies of these behaviors were highly related to episodes of partner behavior (silence with partner speech acts and fidgeting episodes with partner fidgeting episodes, *p*s < .01). All other behaviors are reported as average frequencies. NSA = nonsocially anxious; SA = socially anxious.
[a] SA participants differ from NSA with NSA participants ($p < .05$). [b] SA participants differ from NSA with SA participants ($p < .05$). [c] NSA with SA participants differ from SA participants ($p < .05$). [d] NSA with SA participants differ from NSA with NSA participants ($p < .05$).

question than did those in SA–NSA dyads ($M_{NSA–NSA} = 3.60$, $SD = 2.45$; $M_{SA–NSA} = 2.46$, $SD = 1.56$), $F(1, 54) = 3.26$, $p = .08$. To test the idea that SA participants generated self-talk in response to partner questions, we tallied instances of self-talk that were preceded by partner questions and those preceded by any other partner behavior. Contrary to prediction, SA participants produced more unsolicited self-talk than did their NSA partners, $\chi^2_{likelihood}(1, N = 60) = 3.90$, $p = .04$ (see Figure 1). NSA with NSA participants tended to engage in more unsolicited versus solicited self-talk, although this difference did not reach traditional levels of statistical significance, $\chi^2_L(1, N = 60) = 2.84$, $p = .09$.

With respect to RS, SA participants produced more than NSA with NSA participants and tended to produce more than their own partners ($p = .07$; see Figure 2). More ES was provided in SA–NSA dyads, with the NSA members of those dyads producing more than both SA participants and participants in NSA–NSA dyads. Sequential analyses indicated that RS was more likely than any other type of behavior to precede ES, $\chi^2_{goodness\ of\ fit}(2, N = 120) = 6.73$, $p < .01$, and did so 92% of the time. Despite the fact that more RS and ES occurred among participants in SA–NSA dyads, the pattern of behavior, RS followed by ES, did not differ across the dyads, $\chi^2_L(1, N = 60) = 1.06$, $p = .89$.

Nonverbal Behavior

We had expected SA participants to display fewer pleasant and more polite smiles. Surprisingly, pleasant smiles were displayed with similar frequency across both participant types and dyad types. Consistent with predictions, frequency of polite smiles tended to differ for dyad types, and SA participants produced more polite smiles than did either of the NSA participant groups. To examine smiling reciprocity, we tallied the polite and pleasurable smile onsets of each participant, given the smiling behavior of his or her partner, at a lag of 1 s. In both dyad types, participants frequently smiled back at their partners rather than engaging in any other facial behavior, $\chi^2_{GFI}(4, N = 120) = 30.18$, $p < .01$. In SA–NSA dyads, SA participants were likely to smile politely in response to both types of partner smiles, $\chi^2_L(1, N = 60) = 1.54$, $p = .25$, whereas their NSA partners were more likely to respond with a matching smile, $\chi^2_L(1, N = 60) = 7.02$, $p = .01$. Polite and pleasurable smile responses typically matched the partner's smile type in NSA–NSA dyads, $\chi^2_L(1, N = 60) = 12.17$, $p < .01$ (see Figure 3). Thus, although SA participants returned their partners' smiles, they were less likely to reciprocate with a smile of the same type.

We predicted that SA participants would display more negative affect, including frowns and fidgeting, than NSA participants. Although the frequency of frowns did not differ across dyad or participant types, SA–NSA dyads fidgeted more than NSA–NSA dyads. Interestingly, fidgeting did not discriminate participants in SA–NSA dyads. Sequential analysis was used to examine the hypothesis that fidgeting may be "contagious." It was often true that partners in both dyad types fidgeted simultaneously, rather than when a partner was still (time spent fidgeting jointly: $M_{NSA–NSA} = 62.61$ s, $SD = 30.01$; $M_{SA–NSA} = 86.42$ s, $SD = 44.18$; time spent fidgeting alone: $M_{NSA–NSA} = 9.47$ s, $SD = 4.17$; $M_{SA–NSA} = 11.17$ s, $SD = 4.61$), $\chi^2_L(1, N = 60) = 0.05$, $p = .82$. Further analysis confirmed that SA participants initiated bouts of joint fidgeting more frequently than their NSA partners, $\chi^2_L(1, N = 60) = 6.78$, $p < .01$. Thus, fidgeting appeared to be transmitted across interaction partners and was more frequently initiated by SA participants.

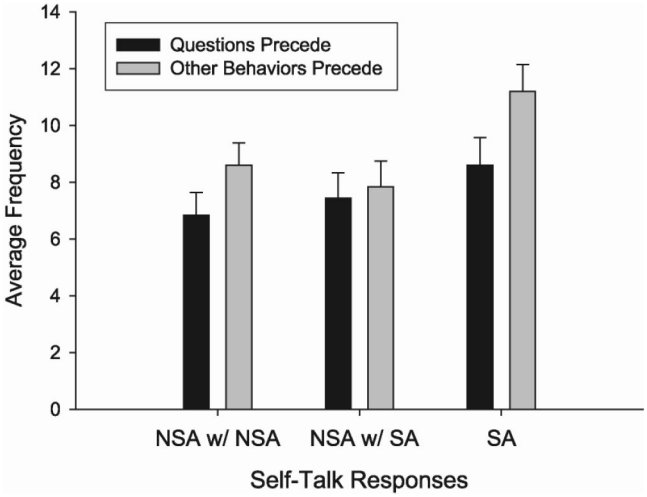

Figure 1. Average frequency of self-talk episodes preceded by questions and those preceded by other behaviors. Data from nonsocially anxious (NSA) with NSA participants reflect both members of the NSA–NSA dyads, as these individuals are not distinguishable from one another on the basis of a priori characteristics. The columns representing NSA with socially anxious (SA) participants and SA participants together reflect the data from SA–NSA dyads. In this case, participants' data are displayed independently as the participant types are distinguishable.

Interaction Outcomes

Prior to beginning the interaction, participants differed on reports of both negative and positive affect (descriptive statistics and all analyses are shown in Table 3). Relative to NSA participants, SA participants reported less positive affect (PA) and more negative affect (NA). We expected participants in SA–NSA dyads to report increased NA from pre- to postinteraction, yet all participants reported a drop in NA. At the dyad level, analyses of change scores showed a tendency for SA–NSA dyads to decrease in NA more than NSA–NSA dyads. SA participants, who showed the largest drop in NA, likely powered this change. Overall levels of postinteraction NA were not significantly different among either dyad or participant types.

Examination of change in PA over the interaction revealed no differences at the level of dyad type but did reveal significant participant type differences. These did not occur as predicted. NSA with SA participants were the only participants who did not report an increase in PA. They differed significantly from both other participant groups in the degree to which positive emotion changed. Although SA participants experienced the greatest rise in positive emotion, their postinteraction levels of PA remained significantly lower than those of NSA with NSA participants, although SA participants did not differ from their own partners ($p = .99$).

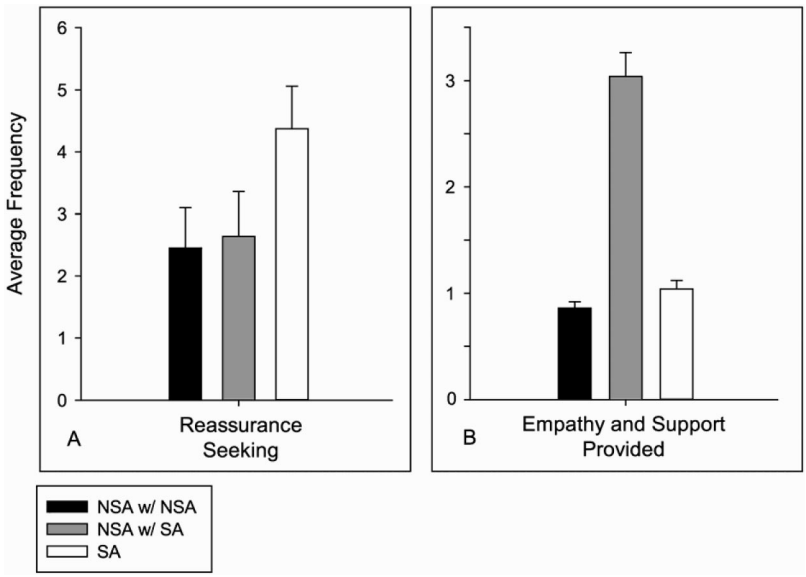

Figure 2. A: Reassurance-seeking behaviors across participant types. B: Empathy and support provided across participant types. Data from nonsocially anxious (NSA) with NSA participants reflect both members of the NSA–NSA dyads, as these individuals are not distinguishable from one another on the basis of a priori characteristics. The columns representing NSA with socially anxious (SA) participants and SA participants together reflect the data from SA–NSA dyads. In this case, participants' data are displayed independently as the participant types are distinguishable.

As predicted, NSA–NSA dyads reported higher QI than did SA–NSA dyads, although participant types did not differ. This finding suggests that NSA with SA participants experienced their interactions differently from participants in NSA–NSA dyads.

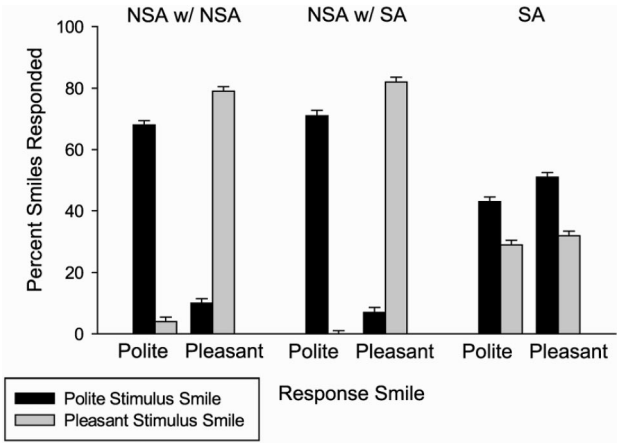

Figure 3. Percentage of responses to polite and pleasurable stimulus smiles across participant type. These do not sum to 100 because participants did not respond to smiles with other smiles 100% of the time. Both types of nonsocially anxious (NSA) participants reciprocated their partners' smile types ($ps < .05$). Data from NSA participants reflect both members of the NSA–NSA dyads, as these individuals are not distinguishable from one another on the basis of a priori characteristics. The columns representing NSA with socially anxious (SA) participants and SA participants together reflect the data from SA–NSA dyads. In this case, participants' data are displayed independently as the participant types are distinguishable.

Consequences of Affect and Behavior for Partner Outcomes

Several behaviors distinguished SA participants from NSA participants. These included more self-relevant talk, altered smiling behavior, and more RS, which resulted in increased ES from partners. In addition, participants differed on self-reported affect and interaction quality. To understand how participants' behavior and affect related to their partners' affect and perceptions of interaction quality, we computed partial correlations between an interactant's behavior and affect and partner's affect and QI ratings, controlling for the partner's preinteraction affect. With respect to behavior, among NSA with NSA participants and among SA participants, increases in RS predicted decreases in partner QI (NSA with NSA: $r_p = -.30$, $p = .02$; SA: $r_p = -.36$, $p = .03$). Among SA participants, increases in self-talk corresponded to decreases in partner PA ($r_p = -.35$, $p = .03$) and QI ($r_p = -.34$, $p = .04$). In addition, the more pleasant smiling SA participants produced, the more PA their partners reported ($r_p = .38$, $p = .02$). Finally, the more ES that NSA with SA participants produced, the more PA their SA partners reported ($r_p = .65$, $p < .001$). Relationships between participants' affect and partners' affect and QI ratings showed somewhat different patterns. In NSA–NSA dyads, dyad members' PA was correlated ($r_p = .34$, $p = .01$), and participant PA also related to partner QI ($r_p = .29$, $p = .02$). Similarly, NSA with SA participants' PA related to partner PA ($r_p = .33$, $p = .04$). SA participants' affect was unrelated to partner affect or QI. Notably, NA was uncorrelated with partner QI, behavior, or affect. These findings suggest that alterations in PA and social

Table 3
Self-Reported Interaction Quality and Affect

	NSA–NSA		SA–NSA							
	NSA with NSA (n = 60)		NSA with SA (n = 30)		SA (n = 30)		Dyad type difference		Participant type difference	
Measure	*M*	*SD*	*M*	*SD*	*M*	*SD*	*F*	*p*	*F*	*p*
Interaction quality	41.97	7.12	35.79	8.18	36.21	8.45	**9.84**	**.01**	0.82	.43
Preinteraction affect[a]										
Negative	19.92	6.11	21.03	6.23	26.09	7.46			**19.34**	**< .01**
Positive	28.65	7.28	28.59	5.02	24.94	6.39			**7.68**	**< .01**
Postinteraction affect[b]										
Negative	17.26	3.54	18.56	5.75	20.41	6.73	0.44	.51	0.11	.75
Positive	30.61	8.45	28.06	5.58	27.94	7.15	1.07	.50	**5.04**	**.03**[c]
Difference score										
Negative	−2.67	4.95	−2.47	4.78	−5.69	5.76	2.77	.10	**5.07**	**.02**[d]
Positive	1.95	5.78	−0.53	3.97	3.00	5.59	0.47	.50	**9.35**	**< .01**[e]

Note. Bold type indicates significant differences. Scores refer to group means. Difference scores reflect postinteraction-preinteraction values. NSA = nonsocially anxious; SA = socially anxious.
[a] Dyad type was not tested because no interaction had occurred at the time of rating; both types of NSA participants were combined into one group. SA participants differed from all NSA participants. [b] Pre- and postinteraction negative affect (NA) were correlated; likewise for positive affect (PA). Therefore, variance associated with preinteraction affect (either NA or PA) was used as a covariate in these analyses. [c] SA participants differ from NSA with NSA participants ($p < .05$). [d] SA participants differ from both NSA with NSA and NSA with SA participants ($p < .05$). [e] NSA with SA participants differ from both NSA with NSA and SA participants ($p < .05$).

behavior have consequences for a partner's experience of PA and perception of interaction quality.

Discussion

The presence of social anxiety during interaction had effects on behavior, affect, and perception that were salient to both anxious and nonanxious interactants alike. Interactions between SA and NSA participants were characterized by less reciprocity in smiling and more fidgeting. The NSA members of those dyads offered more support and empathy compared with individuals in NSA–NSA dyads, viewed their interaction quality as being lower, and failed to experience the increase in positive affect reported by other participants. SA participants, despite a desire to execute smooth social performances, asked fewer questions, engaged in more self-focused talk, and sought more reassurance. Both self-talk and reassurance seeking decreased partner perceptions of interaction quality. In "getting to know you" interactions, a frequent occurrence on college campuses, these signals of anxiety may seem out of place and uncomfortable, thereby serving to decrease the likelihood of future interaction.

These findings support the idea that self-focused attention figures prominently into the characterization of social anxiety, although they suggest that it is not necessarily related to decreased willingness to direct conversation (Pilkonis, 1977). According to models of self-focus in social anxiety (e.g., Clark & Wells, 1995), when anxious individuals enter a social interaction, they focus attention on the self for the purposes of monitoring self-presentation. Thus, attention is shifted to internally generated information, including physiological changes, thoughts, feelings, and beliefs. Worries about social performance are then used to generate negative feelings that serve as feedback, thereby increasing anxiety (Spurr & Stopa, 2002). Insofar as being self-focused leads to self-focused communication, SA participants in the present study demonstrated self-awareness both verbally and nonverbally. Their partners appeared to notice. Research has shown that individuals who converse with a distressed partner report lower feelings of engagement and more social restraint (Furr & Funder, 1998; Joiner & Metalsky, 1995). Judging by the degree to which their partners inhibited spontaneous self-talk and showed diminished perceptions of interaction quality, it is likely that the NSA partners of SA participants perceived the unbalanced conversational focus and found these interactions less rewarding than usual.

Excessive reassurance seeking in conversation may prove a good target for behavioral intervention in social anxiety. The reassurance seeking in which SA participants engaged is consistent with the idea of compulsive checking behavior as an emotion regulation strategy (Casbon et al., 2005; Mennin et al., 2002). This study provides initial evidence that such behavior is related to the presence of social anxiety and may be one of a number of "safety-seeking behaviors" used by anxious individuals (Clark & Wells, 1995). Although the present design did not allow a clear test of this, it may have been the case that fluctuations in negative emotion during the task fueled instances of reassurance seeking.

Nonverbal behaviors provide a significant amount of information during the course of interaction (Chovil, 1991; Keltner & Haidt, 1999). The pleasurable smiles associated with positive emotion have been shown to be a form of social reward (O'Doherty et al., 2003). Receiving these types of smiles is related to positive emotion (Cappella, 1997) and reciprocal smiling be-

havior (Fridlund, 1991). Although SA participants smiled in response to their partners' smiles, they failed to match polite and pleasant smile types. Although it may be socially appropriate to return a smile, important social rewards may be lost when pleasurable smiles are frequently reciprocated with polite ones. NSA participants with SA partners were the only group that did not experience a rise in positive emotion. By failing to match their partners' smile types, SA participants may have failed to provide appropriate social rewards, leading their partners to experience less positive emotion.[1] Moreover, SA participants elicited fidgeting, a signal of anxiety (Okazaki et al., 2002), in their partners. It is not inconceivable that the NSA partners of SA participants experienced some degree of agitation in response to increased fidgeting.

Surprisingly, participants' self-reported affect did not change as predicted over the course of interaction. Although we had anticipated that participants in SA–NSA dyads would show increased NA during the interaction, in fact they did not. All participants reported decreases in NA from pre- to postinteraction. It has been suggested that social interaction leads to decreases in negative emotion (Berry & Hansen, 1996), which may have been the case even for the NSA partners of SA participants. It may also have been true that all participants, and particularly those in SA–NSA dyads, were relieved to have finished the interaction portion of the study.

With respect to positive affect, participants who interacted with NSA participants reported increases in positive affect during the interaction, whereas those who interacted with SA participants reported essentially baseline levels of positive affect. In contrast to the present study, previous findings that socially anxious individuals experience more negative affect and less positive affect during interaction have typically involved confederates (e.g., Kashdan & Roberts, 2004). Because confederates are carefully trained to behave consistently across study interactions, they may have failed to respond to some of the SA participants' behavior (e.g., not providing reassurance), leading SA participants to experience and report more negative affect and less positive affect.

Reciprocity is an important aspect of social interaction. Behaviors, such as smiling, fidgeting, and providing support in response to distress, are typically reciprocated. However, all of these behaviors were altered in SA participants. NSA partners of SA participants changed their behavior in response to these alterations. Previous research has suggested that people who interact with partners who reciprocate social cues in atypical fashion report decreased interaction quality and liking for their social partners (Cappella, 1985). The increased self-talk, persistent fidgeting, and inconsistency in smiling reciprocity on the part of the SA participants may have interfered with the expected patterns of these behaviors, leading to NSA with SA participants' less positive affect and perceptions of interaction quality.

Although this is one of the first studies to address sequential social behavior in social anxiety, it is important to acknowledge some limitations. In particular, the target participants were socially anxious college students. Although these participants experienced significant social distress, indicated by SPAI scores near the clinical mean (Turner et al., 1989), anxious college students likely have more opportunity for interaction than many individuals with clinical diagnoses. However, it has been argued that the differences between socially anxious and socially phobic individuals are more a matter of distress intensity than of differences in symptom quality (Beidel & Turner, 1999; Leary & Kowalski, 1995b). It may be true, then, that symptoms vary by degree but are not qualitatively different between individuals with social anxiety and those with social phobia. This idea is related to a second limitation, that several of the reported effects were small in size. Small effect sizes may be due to having studied a nonclinical sample. It may also be the case that the 5-min interaction was not especially powerful, and a longer interaction period may have strengthened the results. As with any study, replication of these findings, particularly in a clinically diagnosed sample, will be important. Even so, the present study confirms the idea that social anxiety is manifested in social behavior and is, therefore, important to understanding both the nature and maintenance of social anxiety.

Conclusion

During interaction, SA participants were less likely to match the smile types of their partners, initiated more joint fidgeting, engaged in more self-talk, and asked fewer questions. They also engaged in more reassurance seeking, to which their partners responded. These patterns may have led their partners to experience the interactions as subtly one-sided—focused on their SA partners. One implication of these findings is that internal states are revealed in external behavior and, therefore, have consequences for social outcomes. Thus, the self-focus exhibited by SA participants may affect both their social interactions and social relationships. For NSA participants, who likely carry on numerous pleasurable interactions with other NSA individuals over the course of a day, interactions with SA participants did not produce increases in positive affect. Failure to experience an interaction as rewarding may decrease the likelihood of future interaction, thereby serving to reinforce anxiety-related cognitions in individuals with social anxiety.

The degree to which one is able to enjoy and benefit from interaction impacts the development of personal relationships. By remaining fixed on their internal experience, evident in the transmission of anxious arousal, poor reciprocation of positive affect, and repeated reassurance seeking, SA individuals may inadvertently hinder the development of personal relationships and social support networks. As with any study, these findings require replication. Nonetheless, it is clear that the presence of social anxiety and self-focused attention have important consequences within the context of social interaction that are apparent to conversation partners and have the potential to affect social outcomes.

[1] As a caveat to the finding of differences in polite and pleasurable smiles, it is important to note that, although every effort was made to accurately code the tapes, a precise facial coding system, such as the Facial Action Coding System (Ekman & Friesen, 1978), was not used. Because of the design of the study, it was not possible to code facial behavior at close range, making the use of the Facial Action Coding System impossible. Despite the fact that coders achieved high levels of reliability and were blind to participants' anxiety status, it may have been true that some smiles were coded incorrectly simply because coders were unable to detect facial changes. For this reason, differences in smiling behavior must be interpreted with caution.

References

Bakeman, R., & Gottman, J. M. (1997). *Observing interaction: An introduction to sequential analysis* (2nd ed.). New York: Cambridge University Press.

Bakeman, R., & Quera, V. (1995). *Analyzing interaction: Sequential analysis with SDIS & GSEQ.* New York: Cambridge University Press.

Baker, S. R., & Edelmann, R. J. (2002). Is social phobia related to lack of social skills? Duration of skill-related behaviours and ratings of behavioural adequacy. *British Journal of Clinical Psychology, 41,* 243–257.

Barlow, D. H. (2002). *Anxiety and its disorders: The nature and treatment of anxiety and panic* (2nd ed.). New York: Guilford Press.

Beidel, D. C., & Turner, S. M. (1999). The natural course of shyness and related syndromes. In L. A. Schmidt & J. Schulkin (Eds.), *Extreme fear, shyness, and social phobia: Origins, biological mechanisms, and clinical outcomes* (pp. 203–223). New York: Oxford University Press.

Berry, D. S., & Hansen, J. S. (1996). Positive affect, negative affect, and social interaction. *Journal of Personality and Social Psychology, 71,* 796–809.

Cappella, J. N. (1985). Production principles for turn-taking rules in social interaction: Socially anxious vs. socially secure persons. *Journal of Language and Social Psychology, 4,* 193–212.

Cappella, J. N. (1997). Behavioral and judged coordination in adult informal social interactions: Vocal and kinesic indicators. *Journal of Personality and Social Psychology, 72,* 119–131.

Cartwright-Hatton, S., Tschernitz, N., & Gomersall, H. (2005). Social anxiety in children: Social skills deficit, or cognitive distortion? *Behaviour Research and Therapy, 43,* 131–141.

Casbon, T. S., Burns, A. B., Bradbury, T. N., & Joiner, T. E. (2005). Receipt of negative feedback is related to increased negative feedback seeking among individuals with depressive symptoms. *Behaviour Research and Therapy, 43,* 485–504.

Cheek, J. M., & Briggs, S. R. (1990). Shyness as a personality trait. In W. R. Crozier (Ed.), *Shyness and embarrassment: Perspectives from social psychology* (pp. 315–337). New York: Cambridge University Press.

Chovil, N. (1991). Social determinants of facial displays. *Journal of Nonverbal Behavior, 15,* 141–154.

Clark, D. M., & McManus, F. (2002). Information processing in social phobia. *Biological Psychiatry, 51,* 92–100.

Clark, D. M., & Wells, A. (1995). A cognitive model of social phobia. In R. G. Heimberg, M. R. Liebowitz, D. A. Hope, & F. R. Schneier (Eds.), *Social phobia: Diagnosis, assessment, and treatment* (pp. 69–93). New York: Guilford Press.

Crawford, J. R., & Henry, J. D. (2004). The Positive and Negative Affect Schedule (PANAS): Construct validity, measurement properties and normative data in a large non-clinical sample. *British Journal of Clinical Psychology, 43,* 245–265.

DePaullo, B. M., Epstein, J. A., & LeMay, C. S. (1990). Responses of the socially anxious to the prospect of interpersonal evaluation. *Journal of Personality, 58,* 623–640.

Ekman, P. (1992). An argument for basic emotions. *Cognition & Emotion, 6,* 169–200.

Ekman, P., & Friesen, W. V. (1978). *Facial Action Coding System.* Palo Alto, CA: Consulting Psychologists Press.

Field, T., Hernandez-Reif, M., Vera, Y., Gil, K., Diego, M., Bendell, D., et al. (2005). Anxiety and anger effects on depressed mother–infant spontaneous and imitative interactions. *Infant Behavior & Development, 28,* 1–9.

Flory, J. D., Raikkonen, K., Matthews, K. A., & Owens, J. F. (2000). Self-focused attention and mood during everyday social interactions. *Personality and Social Psychology Bulletin, 26,* 875–883.

Fridlund, A. J. (1991). Sociality of solitary smiling: Potentiation by an implicit audience. *Journal of Personality and Social Psychology, 60,* 229–240.

Furr, R. M., & Funder, D. C. (1998). A multimodal analysis of personal negativity. *Journal of Personality and Social Psychology, 74,* 1580–1591.

Hirsch, C. R., Meynen, T., & Clark, D. M. (2004). Negative self-imagery in social anxiety contaminates social interactions. *Memory, 12,* 496–506.

Joiner, T. E., & Metalsky, G. I. (1995). A prospective test of an integrative interpersonal theory of depression: A naturalistic study of college roommates. *Journal of Personality and Social Psychology, 69,* 778–788.

Kashdan, T. B., & Roberts, J. E. (2004). Social anxiety's impact on affect, curiosity, and social self-efficacy during a high self-focus social threat situation. *Cognitive Therapy and Research, 28,* 119–141.

Katz, J., & Joiner, T. E. (2001). The aversive interpersonal context of depression: Emerging perspectives on depressotypic behavior. In R. M. Kowalski (Ed.), *Behaving badly: Aversive behaviors in interpersonal relationships* (pp. 117–147). Washington, DC: American Psychological Association.

Keltner, D., & Haidt, J. (1999). Social functions of emotions at four levels of analysis. *Cognition & Emotion, 13,* 505–521.

Keltner, D., & Haidt, J. (2001). Social functions of emotions. In T. J. Mayne & G. A. Bonanno (Eds.), *Emotions: Current issues and future directions* (pp. 192–213). New York: Guilford Press.

Kenny, D. A. (1996). The design and analysis of social-interaction research. *Annual Review of Psychology, 47,* 59–86.

Kenny, D. A., & la Voie, L. (1985). Separating individual and group effects. *Journal of Personality and Social Psychology, 48,* 339–348.

Kocovski, N. L., & Endler, N. S. (2000). Social anxiety, self-regulation, and fear of negative evaluation. *European Journal of Personality, 14,* 347–358.

Kowalski, R. M., & Leary, M. R. (1990). Strategic self-presentation and the avoidance of aversive events: Antecedents and consequences of self-enhancement and self-depreciation. *Journal of Experimental Social Psychology, 26,* 322–336.

LaFrance, M., & Hecht, M. A. (1999). Option or obligation to smile: The effects of power and gender on facial expression. In P. Philippot & R. S. Feldman (Eds.), *Social context of nonverbal behavior* (pp. 45–70). New York: Cambridge University Press.

Leary, M. R., & Kowalski, R. M. (1993). The Interaction Anxiousness Scale: Construct and criterion-related validity. *Journal of Personality Assessment, 61,* 136–146.

Leary, M. R., & Kowalski, R. M. (1995a). The self-presentation model of social phobia. In R. G. Heimberg, M. R. Liebowitz, D. A. Hope, & F. R. Schneier (Eds.), *Social phobia: Diagnosis, assessment, and treatment* (pp. 94–112). New York: Guilford Press.

Leary, M. R., & Kowalski, R. M. (1995b). *Social anxiety.* New York: Guilford Press.

Leary, M. R., Kowalski, R. M., & Campbell, C. D. (1988). Self-presentational concerns and social anxiety: The role of generalized impression expectancies. *Journal of Research in Personality, 22,* 308–321.

Meleshko, K. G., & Alden, L. E. (1993). Anxiety and self-disclosure: Toward a motivational model. *Journal of Personality and Social Psychology, 64,* 1000–1009.

Mennin, D. S., Heimberg, R. G., Turk, C. L., & Fresco, D. M. (2002). Applying an emotion regulation framework to integrative approaches to generalized anxiety disorder. *Clinical Psychology: Science and Practice, 9,* 85–90.

O'Doherty, J., Winston, J., Critchley, H., Perrett, D., Burt, D. M., & Dolan, R. J. (2003). Beauty in a smile: The role of medial orbitofrontal cortex in facial attractiveness. *Neuropsychologia Special Issue: The Cognitive Neuroscience of Social Behavior, 42,* 147–155.

Okazaki, S., Liu, J. F., Longworth, S. L., & Minn, J. Y. (2002). Asian American–White American differences in expressions of social anxiety:

A replication and extension. *Cultural Diversity and Ethnic Minority Psychology, 8,* 234–247.

Palmer, M. T., & Simmons, K. B. (1995). Communicating intentions through nonverbal behaviors: Conscious and nonconscious encoding of liking. *Human Communication Research, 22,* 128–160.

Perowne, S., & Mansell, W. (2002). Social anxiety, self-focused attention, and the discrimination of negative, neutral and positive audience members by their non-verbal behaviours. *Behavioural and Cognitive Psychotherapy, 30,* 11–23.

Pilkonis, P. A. (1977). The behavioral consequences of shyness. *Journal of Personality, 45,* 596–611.

Rapee, R. M. (1993). The utilisation of working memory by worry. *Behaviour Research and Therapy, 31,* 617–620.

Reno, R. R., & Kenny, D. A. (1992). Effects of self-consciousness and social anxiety on self-disclosure among unacquainted individuals: An application of the Social Relations Model. *Journal of Personality, 60,* 79–94.

Spurr, J. M., & Stopa, L. (2002). Self-focused attention in social phobia and social anxiety. *Clinical Psychology Review, 22,* 947–975.

Thompson, S., & Rapee, R. M. (2002). The effect of situational structure on the social performance of socially anxious and non-anxious participants. *Journal of Behavior Therapy and Experimental Psychiatry, 33,* 91–102.

Turner, S. M., Beidel, D. C., Dancu, C. V., & Stanley, M. A. (1989). An empirically derived inventory to measure social fears and anxiety: The Social Phobia and Anxiety Inventory. *Psychological Assessment, 1,* 35–40.

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology, 54,* 1063–1070.

Wells, A., Clark, D. M., Salkovskis, P., & Ludgate, J. (1995). Social phobia: The role of in-situation safety behaviors in maintaining anxiety and negative beliefs. *Behavior Therapy, 26,* 153–161.

Wells, A., & Papageorgiou, C. (1998). Social phobia: Effects of external attention on anxiety, negative beliefs, and perspective taking. *Behavior Therapy, 29,* 357–370.

Wenzel, A., Graff-Dolezal, J., Macho, M., & Brendle, J. (2005). Communication and social skills in socially anxious and nonanxious individuals in the context of romantic relationships. *Behaviour Research and Therapy, 43,* 505–519.

Woody, S. R. (1996). Effects of focus of attention on anxiety levels and social performance of individuals with social phobia. *Journal of Abnormal Psychology, 105,* 61–69.

Yovetich, N. A., Dale, J. A., & Hudak, M. A. (1990). Benefits of humor in reduction of threat-induced anxiety. *Psychological Reports, 66,* 51–58.

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