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Capturing the Biases of Socially Anxious People by Addressing Partner Effects and Situational Parameters

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To expose biases in self-perceptions of people high in social anxiety, information is needed on actual and perceived informant reports following social situations. We measured trait social anxiety (SA) in 90 college students arranged in pairs for "getting acquainted" conversations. Half participated in a small-talk task, where they took turns answering superficial questions; half participated in a closeness-generating task, where questions required gradual increases in self-disclosure. Afterward, students rated themselves and their partner on positive and negative attributes and how they think their partner viewed them. People with high SA judged themselves more negatively and less positively than their partner did (accuracy); when interacting with a partner endorsing low SA, they possessed enhanced negativity biases about how they expected to be viewed (meta-accuracy), and believed their partner's judgments were less positive than their own low self-judgments (perceived dissent). Conversely, people with low SA showed evidence of a self-enhancement bias about the impression they made on low SA strangers. Other moderators of the social cognitions of people with high SA included gender and the social situation (distortions being amplified in men and small-talk conversations). Our findings suggest that the study of SA cannot be understood using decontextualized approaches, instead requiring consideration of the synergy among the person, partner, and situation.

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ACCORDING TO COGNITIVE MODELS of social anxiety (SA), people become anxious when anticipating, entering, or maintaining social situations because of beliefs that their behavior and defects will cause other people to evaluate them negatively (Clark & Wells, 1995; Rapee & Heimberg, 1997). In addition, being preoccupied with possible negative outcomes disrupts their ability to adequately process ongoing information. People with elevated SA tend to devalue their performance and personal attributes when socializing (Alden & Wallace, 1995), setting the stage for the fear and avoidance of future social encounters (Beidel & Turner, 1998).

Whether a result of social skill or performance deficits (e.g., Stravinsky & Amado, 2001), people with elevated SA often experience adverse consequences following social encounters. Besides negative self-evaluations about their behavior and personality (e.g., Musa & Lépine, 2000), partners often make unfavorable assessments. Objective observers, friends, and acquaintances of people with elevated SA often rate them more negatively on qualities such as warmth, likeability, social competence, and even intelligence (e.g., Gough & Thorne, 1986; Stopa & Clark, 1993). Based on research testing cognitive models, people with elevated SA are more sensitive to negative information, negatively biased toward neutral information, and less sensitive to positive information (Clark & McManus, 2002; Leary, 2004; Stopa & Clark, 1993). These findings suggest that people with elevated SA make more erroneous inferences about how they appear to others.

Despite this extensive literature, relatively few studies have focused on the distinct ways that socially anxious people understand how their emotions, thoughts, and behavior affect the emotions, thoughts, and behavior of a partner (for an exception, see

Christensen, Stein, & Means-Christensen, 2003). Addressing interdependence requires the availability of information from both members of a dyad and the partitioning of this variance into fine-grained indices of social perception (Kenny, Kashy, & Cook, 2006). Consider three examples of interdependent social perceptions in a dyad. To measure *accuracy*, peoples' self-perceptions are associated with their partner's judgment of them. To measure *meta-accuracy*, people's perceptions of their partner's judgment of them (metaperceptions) are associated with their partner's judgment of them. To measure *perceived dissent*, there is a discrepancy between self-perceptions and perceived partner judgments (notice that in this instance, both ratings are made by the same individual). Each of these provide unique information about how people understand the impressions they make on other people (e.g., Carlson & Furr, 2009; Levesque, 1997; Levesque & Kenny, 1993). These methodological and analytic approaches are of particular utility in understanding SA—a condition linked to impression management concerns and information processing biases in perceived social-evaluative situations.

Besides being judged, people with elevated SA judge their partner. Some studies suggest that people with elevated SA evaluate others negatively, particularly on warmth and friendliness (Alden & Taylor, 2004); other studies suggest the opposite effect, with other people being viewed as overly positive and thus, intimidating (Mahone, Bruch, & Heimberg, 1993). Either way, these judgments offer a useful reference point for self-evaluations. Recognition of the negative attributes of another person might assuage anxiety and lead to less negative self-evaluations following an interaction. In particular, socially anxious people recognizing SA in a partner might experience fewer distressing thoughts and feelings and derive greater success in a social interaction. In contrast, overly positive judgments of other people might lead to a greater recognition of one's own weaknesses and discomfort, amplifying negative self-evaluations. Most feedback in social situations is indirect and ambiguous, thus it is easy to be inaccurate about one's performance. Negative attributes about oneself and negative social outcomes can be inferred from the experience of anxious symptoms, a cognitive bias called "emotional reasoning" (e.g., Hackman, Surawy, & Clark, 1998; Mellings & Alden, 2000). Based on this research, it appears that socially anxious individuals experience greater negative cognitive biases when interacting with people deemed as interesting, desirable, and attractive. One partner characteristic that might serve as an immediate proxy for social attractiveness is a lack of SA.

To precisely evaluate the biases linked to SA, researchers can use reciprocal interchanges between strangers meeting for the first time who are assessing each other. Christensen et al. (2003) conducted round-robin 5-minute interactions between pairs of socially anxious and nonsocially anxious participants. Afterward, participants made ratings about themselves, their partner, and *meta-perceptions* or how they thought their partner viewed them. Compared with nonsocially anxious people, socially anxious people viewed themselves more negatively and thought others viewed them more negatively; furthermore, negative metaperceptions were driven by negative self-perceptions and did not accurately reflect their partner's ratings.

THE PRESENT STUDY

We sought to extend the research of Christensen et al. (2003) by examining fine-grained social perceptions during social interactions among strangers and how effects change depending on the SA levels of partners and actors. Besides addressing actor and partner effects, we experimentally manipulated the social situation to estimate the unique and synergistic effects of actor, partner, and relational context on social perceptions.

We hypothesized that SA would be related to (a) poorer accuracy, in terms of greater negative and less positive self-evaluations compared with actual partner ratings; (b) poorer meta-accuracy, in terms of greater negative and less positive perceived partner ratings compared with actual partner ratings; and (c) greater perceived dissent, in terms of a greater bias toward negative self-evaluations compared with perceptions of partner evaluations.

Besides these main effects, we were interested in whether the SA level of partners moderates the social cognitions of actors. Each judgment (accuracy, meta-accuracy, and perceived dissent) was expected to increase in distortion when interaction partners endorsed lower SA. That is, people with elevated SA were expected to overestimate their partner's perceptions of their negative attributes and underestimate perceptions of positive attributes, particularly when partners endorsed low SA; interacting with other high-anxious partners was expected to serve as a protective factor, reducing the intensity of maladaptive social cognitions.

Additionally, we manipulated the amount of personal disclosure explicitly demanded by the conversation. In the small-talk condition, partners took turns asking and answering superficial questions; in the closeness-generating condition, task questions required gradually increasing levels of personal disclosure to answer them. Prior research

has shown that these two common conversations lead to different social (Aron, Melinat, Aron, Vallone, & Bator, 1997; Kashdan & Wenzel, 2005) and emotional (Kashdan & Roberts, 2007) outcomes. The closeness-generating situation resembles an interaction often leading to the development of intimate, meaningful relationships (Reis & Gable, 2003)—providing greater opportunity for a person's intelligence, attractiveness, and personality to be presented clearly and in turn, valued or devalued by partners. With a greater opportunity for rejection, socially anxious people were expected to view this situation as a greater social threat and possess more distorted social cognitions compared to the aftermath of the small-talk condition (Baumeister & Tice, 1990; Gilbert, 2001).

We chose to study interactions between opposite-sex strangers for two reasons. First, inclusion of male–male, female–female, and opposite-sex pairs would require an enormous sample. As an initial study of the synergy among actor, partner, and situational effects, we felt it was prudent to study one pair initially. Any selection among male–male, female–female, and opposite-sex pairs could be criticized for lack of generalizability. We chose opposite-sex pairs because social cognitions following male–male compared with female–female dyads differ on variables beyond SA such as self-disclosure, intimacy, aggressiveness, and related behaviors (Collins & Miller, 1994; Dindia & Allen, 1992; Reis, 1998). Second, opposite-sex interactions tend to be more anxiety-provoking for people with elevated SA (Beidel, Turner, & Dancu, 1985; Fydrich, Chambless, Perry, Buergener, & Beazley, 1998).

There is a relative absence of research on how the cognitive processes of SA are a complex product of the person, his or her partner, and the situational context. The present study focuses on contextually derived cognitive processes linked to SA.

Method

PARTICIPANTS

Ninety-seven undergraduate students participated. Seven participants were excluded from the study, because participants were not scheduled based on gender and thus uneven numbers of men and women often arrived for the study. We selected students who were currently in a monogamous romantic relationship. This inclusionary criterion was used so that the focus of the study would primarily be on friendship formation without the nonrandom confound of trying to initiate sexual interest and relationships.

In the final sample, the 90 college students (45 men, 45 women) had an average age of 19.4 ($SD = 2.2$). The sample included 66 European Americans (73.3%), 9 Asian Americans (10%), 8 African Americans (8.9%), 2 Hispanic Americans (8.9%), and 5 who did not respond to the question. Participants received research credit for courses.

PROCEDURE

Eight to 16 participants were scheduled per session. Students completed questionnaires before and after a social interaction task (adapted from Aron et al., 1997; see Kashdan & Roberts, 2007, for additional data). The task itself was analogous to meeting a stranger for the first time. Experimenters created dyads by randomly matching participants with opposite-sex partners after privately ensuring that partners were unacquainted. Dyads were randomly assigned to one of two 45-minute "getting-acquainted" structured interactions that occurred with four to six dyads together in a single room, mimicking a social gathering situation. Instructions provided by the experimenters were identical, with participants hearing that their goal was to get close to their partner by taking turns sharing information, but the conditions differed on the content of the interaction. Each dyad was handed a set of instructions and three sets of index cards with questions. They were told to take turns reading a question aloud to have their partner respond and, in turn, the reader would respond to the same question. This order would be reversed for each question.

Of the 90 participants, 42 were assigned to the closeness-generating task, where they shared personal information with increasing levels of disclosure both within each set of cards and over the three sets. They spent 15 minutes asking questions from each level before being asked by the experimenters to continue to the next set of questions. Set 1 questions included "What would constitute a 'perfect' day for you?" Set 2 questions included "What is the greatest accomplishment of your life?" Set 3 questions included "When did you last cry in front of another person? By yourself?" This task was designed to increase the depth of information shared, both of the self and about the relationship between the partners. The other 48 participants were assigned to the small-talk task, where they asked each other superficial-level questions. All three sets contained similar superficial-level questions: "What is your favorite holiday? Why?" After 15 minutes, participants moved to the next set of cards, but the emotional depth of the questions remained similar. After the 45 minutes, partners were separated to complete postinteraction measures and reminded that their ratings would remain confidential.

MEASURES

Social Interaction Anxiety Scale

The 20-item Social Interaction Anxiety Scale (SIAS; Mattick & Clarke, 1998) measures fear and avoidance of social interactions. Participants responded to items using a 5-point Likert scale ranging from 0 (*not at all characteristic of me*) to 4 (*extremely characteristic of me*). The positively worded statements were reverse coded, so that higher scores represent greater avoidance of interactional situations. The SIAS has strong reliability and validity across clinical, community, and student samples (Heimberg, Mueller, Holt, Hope, & Liebowitz, 1992; Mattick & Clarke, 1998).

Appraisals of Self and Partner

Participants completed two questionnaires: *Thinking about myself, thinking about my partner*, and *How my partner sees me*. Each questionnaire contained two sections of descriptors for which participants were asked to rate themselves on a scale of 1 (*not at all characteristic*) to 9 (*completely characteristic*). One section contained adjectives describing general traits and attributes. For self-appraisals, appraisals of partner, and perceptions of how partners viewed the self, there were 10 descriptors classified as positive qualities (kind, self-assured, sociable, witty, interesting, warm, socially skilled, patient, confident, and happy) and 10 classified as negative qualities (critical, lazy, controlling, moody, thoughtless, distant, complaining, immature, boring, and unfriendly). Most items were derived from prior research (e.g., Murray, Holmes, & Griffin, 1996). Participants were asked to indicate how much each attribute was characteristic of themselves (positive, $\alpha = .84$; negative, $\alpha = .78$) and their partner (positive, $\alpha = .91$; negative, $\alpha = .75$). Then, participants were asked to think about how their partner saw them; that is, if the participant thinks that his or her partner sees the attribute "intelligent" as moderately characteristic of him or her, the participant would enter "5" beside the attribute (positive, $\alpha = .92$; negative, $\alpha = .73$). Instructions were clarified to participants as required.

Manipulation Check

We included several questions to provide evidence that the closeness-generation task was perceived as such by participants and actual disclosure was greater compared with the small-talk task. Using 9-point Likert scales (from 1 to 9), participants rated the extent to which they disclosed information about their innermost self, disclosed personally important experiences and events, and openly expressed their feelings about their partner in the task. In addition, participants were asked whether they would want to spend time with their partner in the future.

Computing Dyadic Judgments

We standardized the average negative and positive attribute ratings (of the self, partner, and believed partner ratings) separately to allow both partners' scores to contribute equally to the discrepancy scores. This approach adjusts for systematic response biases by empirically equating the actor and partner score distributions (De Los Reyes & Kazdin, 2004). We use a fictional pair of strangers—Anne and Bill—to illustrate our interest in how people view themselves and how people think other people view them in the aftermath of a conversation.

Our first index reflected *accuracy*. To what degree does Anne possess a self-concept consistent with how Bill viewed her? To obtain an *accuracy index*, we calculated a difference score between how Anne rated herself on particular attributes and Bill's actual ratings of Anne. We created separate indices for positive and negative attributes. Higher absolute scores indicate that Anne possesses a distorted negative (or inflated positive) self-concept.

Our second index reflected *meta-accuracy*. To what degree do Anne's beliefs about how she was viewed reflect Bill's actual views? To obtain a *meta-accuracy index*, we calculated the difference between how Anne felt she appeared to Bill and Bill's actual ratings of Anne. We created separate indices for positive and negative attributes. Higher absolute scores indicate that Anne possesses distorted beliefs about how Bill views her.

Our third index reflected *perceived dissent*. To what degree does Anne believe that Bill's views of her differ from her own self-views? To obtain a *perceived dissent index*, we calculated the difference between how Anne believed she appeared to Bill and Anne's ratings of herself (note that both ratings were made by Anne). We created separate indices for positive and negative attributes. Higher absolute scores indicate that Anne believes Bill's opinion of her diverges from her self-concept.

Results

Means, standard deviations, and ranges for basic measures prior to standardization and calculation of discrepancies are reported in Table 1.[1]

[1] Several analyses were conducted to examine the distribution of SA scores across the two conditions in our study. Using a median split of SA scores, we found the conditions to be matched for high- and low-SA participants, $C^2 = 0.98$, $p = .32$. Of the 45 dyads, 24 included one high- and one low-SA participant (15 in closeness generating vs. 9 in small talk), 8 dyads had two high-SA participants (2 vs. 6), and 13 dyads had two low-SA participants (7 vs. 6). These matches of high- and low-SA partners did not significantly differ between conditions, $C^2 = 3.39$, $p = .18$.

Table 1
Descriptive data for all relevant independent and dependent variables (mean [standard deviation])

	Small Talk (N=42)		Closeness Generating (N=48)		Range
	Men (N=21)	Women (N=21)	Men (N=24)	Women (N=24)	
Social anxiety	23.4 (11.8)	22.2 (11.1)	26.1 (13.3)	18.0 (11.5)	5–56
Positive self-view	6.6 (1.2)	6.6 (1.4)	6.4 (0.9)	7.1 (1.2)	3.9–9.0
Negative self-view	2.8 (0.9)	2.4 (1.2)	2.9 (1.3)	2.4 (0.9)	1.0–6.0
Positive other-view	6.5 (1.2)	6.8 (1.7)	6.7 (1.0)	6.7 (1.2)	2.9–9.0
Negative other-view	2.0 (0.7)	1.8 (0.8)	2.0 (0.8)	1.9 (0.8)	1.0–4.2
Positive metaperception	6.2 (1.4)	6.5 (1.3)	6.1 (1.5)	6.7 (1.6)	1.6–9.0
Negative metaperception	2.3 (0.8)	1.9 (1.0)	2.6 (1.1)	2.0 (0.8)	1.0–6.9

Participants' average SA scores (M=22.5; SD=12.2) were similar to other large nonclinical samples (M=19.9, SD=15.6; Heimberg et al., 1992; Mattick & Clarke, 1998). Participants scoring greater than one standard deviation above the mean in our sample (M=42.0, SD=10.3) approximated the SIAS cut-off for reliability, differentiating people with and without diagnoses of social anxiety disorder ($\geq$34.0; Brown et al., 1997). Additionally, the scores of this subgroup in our sample were similar to individuals diagnosed with social anxiety disorder (M=49.0, SD=15.6; Heimberg et al., 1992). In our sample, participants scoring lower than one standard deviation below the mean on the SIAS scores (M=7.8, SD=1.6) approximated participants scoring at least one standard deviation below the mean in prior studies using nonclinical samples (Heimberg et al., 1992). All subsequent analyses examined SA as a continuous variable.

Initial analyses focused on the validity of our situational manipulation. Compared to the small-talk task, participants reported greater disclosure of information about their innermost self, t (88)=3.63, p<.001, d=.77; greater disclosure of personally important experiences and events, t (88)=2.05, p<.05, d=.44; and greater open expression of feelings about their partner, t (88)=2.17, p=.06, d=.46 in the closeness-generating task. In addition, there was a trend for participants in the closeness condition to endorse wanting to spend more time with their partner in the future, t (81)=1.92, p=.06, d=.41. Thus, participants tended to feel differently and predicted different behaviors following our two experimental situations in the hypothesized manner.

Due to the interdependence of people within dyads, we estimated actor and partner effects simultaneously with SPSS mixed modeling, relying on the Actor–Partner Interdependence Model (APIM) (Kenny et al., 2006) to analyze dyads distinguishable by gender. Each person in the study contributes data for only one dyad. In terms of the nonindependence of individual cases, APIM allows for this variance to be modeled instead of being relegated to error. In addition, APIM allows for simultaneous estimation of how a person and his or her dyadic partner both contribute to the same outcome. Several effects can be estimated. Actor effects reflect the association between a person's score on a predictor and his or her own score on an outcome (e.g., how Anne's SA relates to her own appraisals). Partner effects describe the association between a person's score on a predictor and the partner's score on an outcome (e.g., how Anne's SA relates to her interaction partner's appraisals). Besides these main effects, we can estimate the interaction between actor and partner effects (e.g., how the effect of Anne's SA on her own appraisals is influenced by her partner's SA or the situation context) and consider additional factors such as conversational content that might moderate individual and/or partner effects on outcome variables.

For all analyses, two-tailed tests of significance were used, with alpha-levels at p=.05. Effect sizes were calculated accounting for dyad interdependence (see Kenny et al., 2006).

We began our analyses by examining differences in how high- and low-SA participants evaluated themselves, others, and expected evaluations of others on positive and negative attributes. High-SA participants rated themselves higher on negative attributes and lower on positive attributes (ps<.01). They also believed others to rate them more negatively and less positively, consistent with their own negative self-views (ps<.01). High-SA participants did not, however, rate their partner differently on positive or negative attributes.

Our primary focus was the contribution of Actor×Partner interactions and the influence of situational context (small-talk vs. closeness-generating interaction) on accuracy, meta-accuracy, and perceived dissent in judging positive and negative attributes. Accuracy reflects how people rate themselves compared with how their partner actually views them; meta-accuracy reflects how

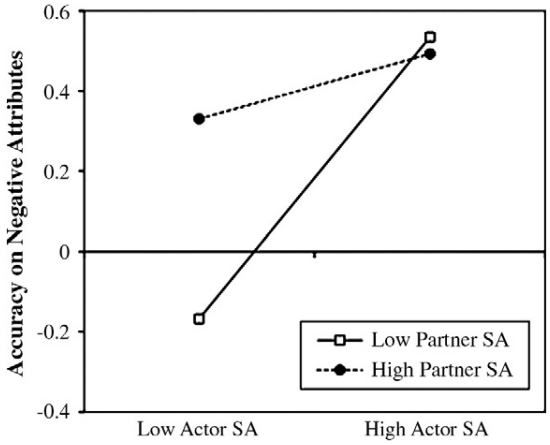

FIGURE 1 Estimating negative self-attributes compared to actual partner ratings (accuracy) depends on social anxiety of self and partner. *Note*. SA = social anxiety. Statistically significant Actor × Partner interaction on accuracy of negative self-appraisals using dyadic analyses. Higher scores represent overestimation of one's negative self-concept compared to partner ratings.

people's beliefs about partner views are consistent with the actual views of partners; perceived dissent reflects how people's beliefs about themselves fail to match what they think other people think of them.

Our first hypothesis was that people with greater SA would have a distorted self-concept (accuracy) such that they rate themselves less positively and more negatively than others rate them. Our second hypothesis was that people with greater SA would have distorted beliefs of how their partners perceived them (meta-accuracy) such that they believe partners rate them less positively and more negatively than partners actually do. Our third hypothesis is that people with greater SA believe they are seen by others even more negatively and less positively than they view themselves (perceived dissent). Each model included the effects of experimental condition, gender, *actor* SA, *partner* SA, Actor × Partner interactions, Gender × *Actor* SA, Gender × *Partner* SA, and Condition × *Actor* SA and Condition × *Partner* SA interactions on outcomes. Nonsignificant interaction terms were excluded from models to maintain sufficient statistical power. Significant interactions were examined with simple slope analyses. Curvilinear relationships were also tested, but not included due to nonsignificant results.

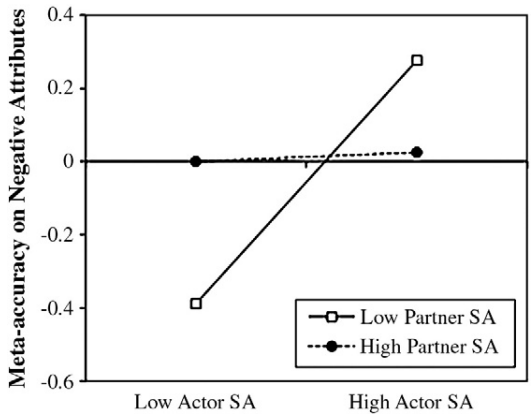

FIGURE 2 Estimating negative attributes compared to perceptions of partner ratings (meta-accuracy) depends on social anxiety of self and partner. *Note*. SA = social anxiety. Statistically significant Actor × Partner interaction on meta-accuracy of positive attributes using dyadic analyses. Scores above 0 represent overestimating the negativity of partner ratings about one's negative attributes. Scores below 0 represent an underestimation of a partner's actual ratings.

ACCURACY

We expected socially anxious people to rate themselves less positively and more negatively than others rate them. People with greater SA exhibited a significant disparity between how they rated themselves and how their partner rated them on positive attributes, $b = -0.42$, $t(68.4) = -3.01$, $p = .002$, $d = .47$. Specifically, people with high SA endorse a less positive self-concept compared with their partner's view of them. Partner SA, social context, and gender did not predict accuracy in these self-ratings, and there were no interaction effects ($ps > .10$).

There was an Actor SA × Partner SA effect on accuracy regarding negative attributes, $b = -0.14$, $t(41.3) = -1.67$, $p = .05$, $d = .42$. Figure 1 shows that people with greater SA overestimated their negative attributes compared with how their partner viewed them, suggesting a distorted negative self-concept regardless of the partner. However, people with low SA rated themselves less negatively than their partner did when interacting with a low-SA partner, but they rated themselves more negatively than their partner did when interacting with a high-SA partner. There was also a trend-level gender effect, where men tended to rate their negative attributes more negatively than their partner rated them, $b = 0.30$, $t(43.13) = 1.38$, $p = .09$, $d = .32$. No other significant main effects or interaction effects ($ps > .10$) emerged.

These findings suggest that people with high SA tend to have a generally deflated positive self-concept and distorted negative self-concept. In contrast, low-SA people had a more accurate self-concept after interacting with a less anxious partner, but tended to have a distorted negative self-concept following interactions with a high-SA partner.

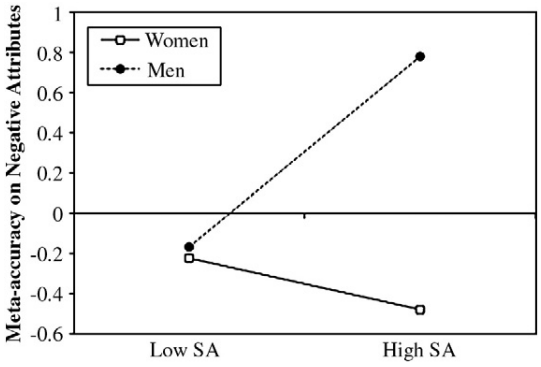

FIGURE 3 Estimating negative attributes compared to perceptions of partner ratings (meta-accuracy) depends on social anxiety of self and gender. *Note.* SA = social anxiety. Statistically significant Actor × Gender interaction on meta-accuracy of negative attributes using dyadic analyses. Higher scores represent overestimating the negativity of how partners actually rated one's negative attributes.

META-ACCURACY

We expected socially anxious people to believe that their partner rated them less positively and more negatively than their partner actually rated them. Consistent with this hypothesis, people with greater SA exhibited less meta-accuracy in predicting how their partner rated them on positive attributes, $b = -0.40$, t (67.0) $= -2.96$, $p = .002$, $d = .77$. Socially anxious people underestimated now positively their partner would rate them. No other significant main effects or interaction effects emerged for meta-accuracy on positive attributes (ps $> .10$).

There was an Actor SA × Partner SA effect on meta-accuracy regarding negative attributes, $b = -0.16$, $t(40.0) = -1.81$, $p = .039$, $d = .42$. Figure 2 shows that high-SA people were particularly prone to *over*estimating partner ratings of their negative attributes when the partner was low in SA compared with a partner high in SA. Conversely, low-SA people were more likely to *under*estimate their partner's negative ratings when the partner was low in SA. In addition, there was a significant Actor SA × Gender interaction, $b = 0.30$, $t(63.0) = 2.03$, $p = .024$, $d = .47$. As shown in Figure 3, socially anxious men overestimated partner ratings of their negative attributes ($p = .04$), whereas the meta-accuracy of socially anxious women was similar to nonanxious women ($p = .48$). No other main or interaction effects predicted meta-accuracy on negative attributes (ps $> .10$).

These findings suggest that people with greater SA tend to believe that others see them less positively than they are actually rated, but that the degree to which they overestimate negative attribute ratings is influenced by their gender and their partner's SA level. Socially anxious men display more distorted beliefs about how their negative qualities will be rated. The absence of a three-way interaction between actor SA, partner SA, and gender suggests that the synergy between actor and partner SA cannot be fully explained by the biases of socially anxious men.

PERCEIVED DISSENT

We expected socially anxious people to believe that partners rate them less positively and more negatively than socially anxious people rate themselves. Several significant interaction effects emerged. There was a significant Actor SA × Partner SA interaction effect, $b = -0.11$, $t(38.67) = 1.76$, $p = .047$, $d = .51$. Figure 4 shows that high-SA people believed their partner failed to recognize their positive qualities, particularly if their partner was low in SA; low-SA people believed their positive qualities were highly visible and appreciated regardless of the SA level of the interaction partner (self-enhancement bias). There was a significant Actor SA × Gender interaction, $b = 0.14$, $t(77.45) = 1.99$, $p = .025$, $d = .57$, where low-SA men tended to have a stronger self-enhancement bias (believing partners to see more positive qualities in them than they see in themselves) than high-SA men—who tended to believe their positive qualities were not as visible to others. Upon examining the slopes separately by gender, there was a nonsignificant effect for women. We also found a significant Actor SA × Condition effect, $b = -0.23$, $t(74.08) = -1.78$,

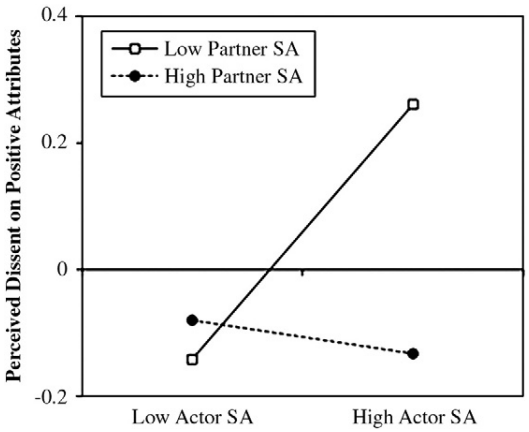

FIGURE 4 Estimating degree of dissent between self-views of positive attributes and beliefs about how partners viewed them on these positive attributes (perceived dissent) depends on partner social anxiety. *Note.* SA = social anxiety. Statistically significant Actor × Partner interaction on perceived dissent on positive attributes using dyadic analyses. Higher scores represent beliefs that partners overestimate positive attributes beyond how one views oneself. Scores below 0 represent beliefs that partners underestimate positive attributes compared to one's self-views.

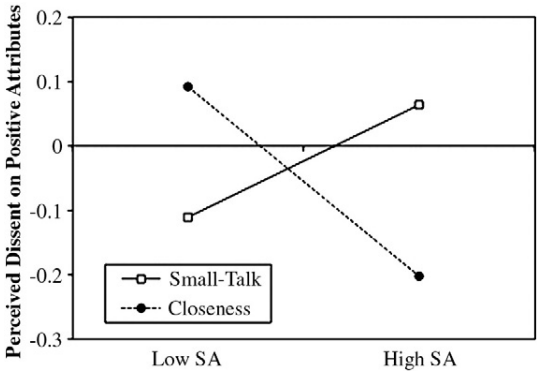

FIGURE 5 Estimating degree of dissent between self-views of positive attributes and beliefs about how partners viewed them on these positive attributes (perceived dissent) depends on condition. *Note.* SA = social anxiety. Statistically significant Actor × Condition interaction on perceived dissent on positive attributes using dyadic analyses. Higher scores represent beliefs that partners overestimate positive attributes beyond how one views oneself. Scores below 0 represent beliefs that partners underestimate positive attributes compared to one's self-views.

$p = .04$, $d = .52$. As shown in Figure 5, high-SA participants were more likely to believe their partner would fail to recognize their positive qualities following the small-talk condition, while low-SA participants were more likely to believe their partner would fail to recognize their positive qualities following the closeness-induction condition. Upon examining the slopes separately by gender these effects appear to be driven by men ($p = .006$) and not women ($p = .27$).There were no significant main or interaction effects on perceived dissent on negative attributes ($ps > .10$).

These results partially support our hypotheses, showing that people with greater SA have a consistent belief that others view their negative attributes just as negatively as they do, but views about their positive attributes depend on conversation partners and the situation. For socially anxious people, interacting with less socially anxious people and disclosing only superficial-level information was associated with beliefs that their partner viewed them less positively than they viewed themselves. For low-SA people, disclosing more personal information was related to beliefs that their partner viewed them less positively than they viewed themselves.

Discussion

The results confirm prior theories of negative biases associated with SA (Clark & Wells, 1995; Rapee & Heimberg, 1997). This includes perceiving oneself and expecting others to view oneself more negatively and less positively. These appraisals are consistent with findings that socially anxious people selectively retrieve negative information about themselves and their performance (Clark & McManus, 2002), leading to pessimistic predictions about future socializing (Alden, Mellings, & Laposa, 2004).

Our novel contribution is an attempt to address the dynamic interplay of SA, partner levels of SA, and situational parameters on perceptions of self, partners, and how partners viewed the self. We investigated the discrepancy between how people rate their behavior and how they are actually perceived—what we refer to as accuracy; the discrepancy between how people believe they are being perceived and how they are actually perceived —what we refer to as meta-accuracy; and the discrepancy between how people believe they acted and how they believe the other person viewed them —what we refer to as perceived dissent. A series of interaction effects suggest that the SA levels of two unacquainted strangers operate in tandem to predict accuracy and biases.

People high in SA viewed themselves more negatively and less positively compared with their partner's actual views. For people high in SA, these views were unaffected by the SA of partners. In contrast, people low in SA viewed themselves less negatively than their partner did only when the partner was also low in SA. Similar synergistic findings between actors and partners existed when shifting from accuracy to meta-accuracy. People high in SA expected to be viewed more negatively compared with their partner's actual views, but distorted views of negative attributes changed depending on the personality of the partner. Following interactions with a low-SA partner, the negative impressions that high-SA people believed they made far exceeded how they actually appeared to their partner; in contrast, low-SA people judged themselves as better than the actual impression made on their partner. That is, low-SA people showed evidence of a self-enhancement bias about the impression they made on low-SA strangers; this was missing in high-SA people where self-criticism appeared to prevail. More work is needed on how the lack of self-enhancement following initial social interactions influences anticipatory anxiety and performance in subsequent encounters with the same person. This might be an understated factor in the development and maintenance of SA (Leary, 2004; Moscovitch, 2009).

We suggest two possible explanations for the ways in which accuracy and meta-accuracy effects change depending on the nature of the actor and partner. High-SA people believe that people interacting with them fail to recognize them as a worthy

social investment when alternative partners exist who are more competent, attractive, and socially desirable (Gilbert, 2001; Leary, 2004). That is, high-SA people do more than devalue themselves, they inflate the value of interaction partners—judging them as particularly interesting and desirable (Gilbert, 2001; Mahone et al., 1993). In addition, following interactions with a high-SA partner, low-SA people overestimate their own negative qualities—which might be the result of comparisons with the inflated positive judgments of high-SA people. Alternatively, the aversive emotions, behavior, and feedback of high-SA people might be internalized by low-SA people. Emotional contagion might lead to flawed self-assessments. Future studies can test alternative explanations of how self- and other-assessments change depending on the personality of interaction partners.

It is worth mentioning that regardless of the SA of actors, the ability to detect the impression being made was near perfect when interacting with high-SA partners. This might be an index of low disclosure, low emotionally expressive interactions with high-SA partners. Prior research suggests that people with SA problems fail to reciprocate the verbal self-disclosure of others (Alden & Bieling, 1998; Meleshko & Alden, 1993; Papsdorf & Alden, 1998). However, it is possible that high-SA people show greater overt emotional expressivessness that in turn, increases the opportunity to be clear about perceived and actual impressions. Observational data in future research can explore person-specific and dyadic content that influences meta-accuracy.

We also found gender to be an important factor in how people's SA influenced meta-accuracy and the perceived dissent between how they viewed themselves and how they thought their partner viewed them on positive attributes. Specifically, men who were high in SA overestimated how negatively their partner would rate them; women high and low in SA did not significantly differ. Men who were low in SA exhibited a self-enhancement bias, where they believed their interaction partner would rate them higher on positive qualities than they would rate themselves. High-SA men showed an opposite tendency; they believed their positive qualities were rather invisible to others. These gender differences suggest that beliefs about how one is perceived by others may be particularly important treatment targets for men, especially in the context of opposite-sex interactions.

We found additional evidence to suggest that the small-talk condition, compared to the closeness-induction condition, provided a greater challenge to people with high SA. Specifically, high-SA people had greater distortions following the small-talk condition, while low-SA participants had greater distortions following the closeness-induction condition. People with elevated SA might perceive greater threat during the small-talk task because social self-efficacy is minimal and there are fewer cues of social success and failure such as rapport building. Moreover, there is evidence that at least a sizeable minority of people with elevated SA possess social skill deficits that include small talk and other attempts to initiate and maintain conversations (Beidel & Turner, 1998; Hopko, McNeil, Zvolensky, & Eifert, 2001). Additionally, small talk might evoke greater anxiety and boredom, which can be attributed to stable characteristics of the self, increasing the likelihood of self-denigration (Allen & Badcock, 2003; Gilbert, 2001; Leary, 2004). People high in SA might believe that their positive qualities are not appreciated during small talk; they lack adequate opportunity to share relevant information to convey positive qualities. Conversely, people with low SA found that they were unable to showcase their positive qualities adequately in the closeness task. Perhaps this is another indicator of the self-enhancement bias found for people with low, but not high, SA.

Taken together, these results suggest that to understand SA, researchers need to examine how the types of situations encountered yield a unique repertoire of cognitive, emotional, and behavioral responses (e.g., Mischel & Shoda, 1995; Shoda & Smith, 2004). Other people matter, in terms of their personality profile, when discerning the social cognitions of people varying in SA. The next step is to examine the stability of these environmental contingencies and whether a person with elevated SA and consistent self-denigration following interactions with low-SA people is at a greater disadvantage in terms of everyday well-being and functioning.

Few studies have moved beyond structured and nonstructured social situations (e.g., Thompson & Rapee, 2002) and same versus opposite-sex partners (e.g., Turner, Beidel, Dancu, & Keys, 1986) to understand the parameters of when SA problems are most pronounced; in this study, our focus was on interactive actor, partner, and situational influences. Moreover, our study departs from the usage of confederates as interaction partners (see also Beck, Davila, Farrow, & Grant, 2006; Christensen et al., 2003; Heerey & Kring, 2007; Wenzel, Graff-Dolezal, Macho, & Brendel, 2005). By having two participants involved in the conversation, with similar hesitations regarding the experimental setting, the resulting conversation closer approximates a naturalistic setting. In addition, ratings of the self and the partner are

more applicable for dyadic analyses, because both partners experienced the interaction in a similar capacity.

This study represents an analog to the beginning stages of heterosexual relationships. If we were to dissect a relationship, in essence, it comprises repeated, ongoing social interactions, each leading to cognitive appraisals and comparisons to meaningful reference points (e.g., accuracy, meta-accuracy). The biases we found in this study, if they persist over the long term, have implications for relationship satisfaction and maintenance. For example, meta-accuracy has direct relevance to perceiving a friend's satisfaction with the relationship, which may influence how one responds to and behaves toward him or her. Self-enhancement bias is relevant to being optimistic about oneself and the relationship that, in turn, promotes responsiveness, investment, and secure attachments (e.g., Srivastava, McGonigal, Richards, Butler, & Gross, 2006). In addition, the difficulties that high-SA people have in accurately understanding how low-SA people view them might extend to real-world relationship problems. Poorer communication, problem-solving skills, and inefficient social coordination exhaust finite attentional capacities and physical stamina (Finkel, Campbell, & Brunell, 2006). These negative interchanges might be more systematic as partners diverge in trait levels of SA (Kashdan, Volkmann, Breen, & Han, 2007). Our results suggest that men with high SA have a particular tendency to believe that conversation partners are unable to see their positive qualities. Observational studies can examine the sequence of how SA affects the social coordination and self-regulation of couples when exposed to potential threats and rewards. We suspect that, over time, the high negativity and low positivity of people with high SA drains the limited resources of low-SA partners, disrupting the quality and longevity of relationships. Simultaneously modeling actor and partner effects over time can address causal links among traits, perceptions, and relationship outcomes.

CAVEATS AND IMPLICATIONS

Our method incorporates a specific, controlled setting. By manipulating the types of questions asked of partners in a 45-minute conversation, we were able to control the rate and degree of disclosure. However, this research context is different from naturalistic settings; thus our findings may not generalize to everyday environments. Other features that compromise generalizability include the focus on dyadic conversations among opposite-sex unacquainted college students who are currently in romantic relationships. Because satisfaction in current relationships was not assessed, a select number of people might have experienced sexual interest, pursuing romantic instead of platonic relationships. Social interaction studies of strangers are plagued by decision rules that limit generalizability—the use of same- or opposite-sex partners, length of tasks, and the use of unstructured or semistructured interactions. In the absence of ideal choices, the current study should be treated no differently than other social interaction studies. Careful attention should be given to unique decision rules and their possible influence on the results (uncovering meaningful contextual moderators).

Willingness to disclose personal information may differ by gender and, moreover, by the partner's gender. Snell (1989) found that people with elevated SA are more comfortable disclosing gender-specific behaviors to same-sex than opposite-sex friends. Our results from the closeness compared to small-talk condition may have operated differently with same-sex dyads. Despite the intriguing nature of our findings, few studies have examined situational parameters and thus, replication is needed with other samples and methodologies (e.g., ecological momentary assessment).

Using self-report measures after interactions presents a difficulty in interpretation, as effects due to the interaction itself are hard to distinguish from dispositions (Kashy & Kenny, 2000). This is particularly relevant for SA individuals who tend to remember less partner-related information after social interactions (Hope, Heimberg, & Klein, 1990; Mellings & Alden, 2000), highlight negative social information (Valjaca & Rapee, 1998), and confuse actual social stimuli with negatively biased elaborations (Hertel, Brozovich, Joormann, & Gotlib, 2008). Yet, self-evaluation after an interaction is as important, if not more, than how behaviors are perceived during an interaction. This is especially true if one shows interest in participating in a similar activity again (e.g., Wirtz, Kruger, Scollon, & Diener, 2003). In our study, people high in SA recognized disparities between their own negative attributes and their partner's attributes; their accuracy, meta-accuracy, and perceived dissent point to unique negative biases that derive from unique reference points of comparison. These biases can amplify anticipatory anxiety for future interactions and perpetuate social avoidance, amplifying loneliness and impairment.

It is notable that we used an undergraduate sample unselected for SA levels. Only 15% of our sample scored in the clinical range; given their educational status, they might be construed as being moderate to high in daily functioning. Moreover,

our sample was largely Caucasian and of a relatively narrow age range. Consequently, replication is needed with a treatment-seeking sample to determine whether the findings generalize to a clinical population. Finally, only a small number of dyads contained two people with elevated SA and these dyads were less equally distributed across conditions compared to other pairings, which could have affected our results. Perhaps future studies could select for and ensure that the numbers of various pairings are larger and more equally distributed.

Current results suggest that treatment focusing on negative interpretation bias, particularly in situations involving intimate personal disclosure, may be critical to managing SA symptoms. A number of studies have shown reductions in social cognitive biases following computerized interpretation modification programs (Beard & Amir, 2008) and video feedback (Rapee & Hayman, 1996). In addition, cognitive–behavioral group therapy has been shown to reduce self-evaluation biases by providing real feedback from peers (Hofmann & Otto, 2008; Hope, Heimberg, & Bruch, 1995). These studies support the importance of adjusting (mis)perceptions of social stimuli and the visibility of anxiety and behavior. Additional work can examine the adjunctive benefits of mindfulness-based approaches where the focus is less on reducing cognitive distortions and more on decreasing evaluative judgments of the self such that mental content is recognized as products of the brain instead of literal representations of reality. The comparative value of cognitive restructuring techniques, interaction feedback, and mindfulness skills in helping people with SA address interpretation biases and self-devaluation remains unknown.

Our research adopts the perspective that the study and treatment of SA cannot be understood using static or decontextualized approaches but rather must be viewed as a product of the person, the situation, and the relationship context. Neglecting these sources of variance can lead to erroneous conclusions about when SA is linked with helpful and unhelpful social outcomes.

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