Social Anxiety and the Cued Activation of Relational Knowledge

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A cued activation procedure was used to examine the hypothesis that social anxiety involves an expectation of being rejected or evaluated negatively by others, combined with a concern about impression management. Participants underwent a conditioning procedure in which distinctive computer tones were paired with thoughts of social rejection and acceptance, respectively. In a pilot study, a lexical decision task established that when these tone cues were played later, they differentially activated expectations of rejection. In the main study, female participants interacted with a male confederate while one of the tones, or a control tone, sounded repeatedly in the background. Several indicators of social anxiety showed an interaction between level of public self-consciousness and the nature of the tone played. High-self-conscious individuals tended to be affected by the cues, whereas low-self-conscious people were not affected.

Social anxiety in one of its forms, such as shyness or dating anxiety, is a common experience in interpersonal relationships: we feel awkward, we stammer, we blush. Occasionally, we may come to avoid social situations that could lead to embarrassment, and this social avoidance can produce loneliness and other relationship difficulties.

A fear of negative interpersonal evaluation has been identified as the central precipitating factor in social anxiety (Edelmann, 1992; Ingram & Kendall, 1987; Winton, Clark, & Edelmann, 1995). In their well-known model of social anxiety, Schlenker and Leary (1982; also Leary & Kowalski, 1995) characterized this fear as arising from two factors: (a) The individual anticipates making an unwanted impression on others, and (b) is very concerned about or focused on the impression he or she is making.

Previous research has already fleshed out this model with some of the elements contributing to the fear of negative evaluation, such as the perception of others as rejecting and hypercritical (e.g., Hartmann, 1983; Wallace & Alden, 1991). We sought to build on previous work by using a novel experimental paradigm to examine the effects of knowledge activation on social anxiety during an initial encounter. Our guiding assumption was that the expectation of negative evaluation results from negative memories and knowledge structures becoming activated and influencing the anticipation and interpretation of the current interaction. When a woman meets a man for the first time, for example, what autobiographical memories resonate with the current context? What interpersonal scripts (e.g., "If I say something foolish, he will dismiss me?") influence—even implicitly, outside of conscious awareness—the interpretation of ongoing experience? What images of social events (e.g., being teased or criticized) pop into mind so easily that they seem inevitable outcomes of the upcoming interaction? And, the focus of this article, "What determines which memories and knowledge structures get activated?"

The Cued Activation of Relational Knowledge

Priming research has demonstrated the possibility of directly activating relational schemas representing social acceptance and rejection. Various forms of priming manipulation, including guided visualizations (Baldwin &

Holmes, 1987; Baldwin, Keelan, Fehr, Enns & Koh-Rangarajoo, 1996; Baldwin & Sinclair, 1996), presentations of significant others' names (Baldwin, 1994), and subliminal exposures of a significant other's face (Baldwin, Carrell, & Lopez, 1990), have produced self-evaluative and interpersonal effects. In one study, for example, graduate students who were subliminally primed with their department chair's scowling face were more self-critical of their own research performance than were their unprimed counterparts (Baldwin et al., 1990). In another study, people visualizing significant others who made them feel avoidant, anxious, or secure were later differentially motivated to meet prospective dating partners with similar attachment characteristics (Baldwin et al., 1996).

Although the activation of relational information often occurs in just this way—a telephone call early in the morning from a critical acquaintance certainly can make one feel less than secure for the rest of the day—during actual encounters, evaluative expectancies can be triggered by more indirect cues. In theory, any minimal cue, if it becomes associated with specific interpersonal experiences, should be able to activate relational knowledge. For example, a woman who was repeatedly criticized as a child by her piano teacher might find that the mere sight, or thought, of a piano makes her somewhat uneasy and insecure. Conversely, a man routinely enjoying warm interactions with a loved one while dining on ethnic cuisine might develop a positive association to that particular comfort food. As Bargh and Ferguson (2000) have argued, many social cognitive structures and processes are set in motion by environmental cues; this principle surely applies to the activation of relational schemas.

Testing this mechanism in the lab would involve experimentally creating a new association between a relational schema and a neutral cue, such that presentation of the neutral cue later serves to activate the relational schema. A few recent studies have demonstrated that this is possible: In three studies by Baldwin, Granzberg, Pippus, and Pritchard (2001) using the same manipulation as in the current studies, participants completed a bogus computerized questionnaire that gave them 10 trials of approval (a row of smiling faces) and disapproval (a row of frowning faces) feedback, paired respectively with two distinctive computer-generated tones. Later, while participants completed a package of dependent measures, a computer on the other side of the room repeatedly emitted one of the tones. Women's ratings of their self-esteem at that moment were lower if the tone being played was the one that had once signaled rejection.

Although much can be learned by studying how cued activation mechanisms influence self-evaluative thoughts

in the context of an experimental task, the most appropriate situation for studying social anxiety is during an uncomfortable social encounter. Would this kind of cued activation procedure have an impact on people's thoughts, feelings, and behavior during a social interaction? After all, there are so many other influences and distractions: the give and take of the conversation, the comments the other person makes, the actual characteristics of the interaction partner. If knowledge activation is a key element in social anxiety, however, perception of the ongoing interaction should be shaped to some degree by whatever knowledge is activated at the moment, even if it is triggered by so minimal a cue as a tone sounding in the background. As a strong test of the knowledge activation premise, therefore, we administered the cued activation manipulation during an initial interaction between a woman and a man and included measures of mood, self-esteem, and interpersonal behavior.

Self-Consciousness and the Concern With Impression Management

Schlenker and Leary's (1982) model of social anxiety holds that the activation of a negative or unwanted evaluative expectancy is only one of two factors contributing to social anxiety; the other is impression motivation, a concern with creating a certain impression on others. It is logical that people who are highly focused on how they are evaluated by an interaction partner should be the most influenced by activated relational knowledge about acceptance and rejection. Indeed, there is a substantial literature (see Wicklund, 1975, for a review) demonstrating that when people focus their attention on themselves, this increases their evaluative concerns, making them more responsive to evaluative standards and feedback of various kinds. Consequently, social anxiety researchers have operationalized the impression motivation factor as high and low scores on the individual difference measure of public self-consciousness (Fenigstein, Scheier, & Buss, 1975) and have indeed found a strong link to social anxiety. With items such as "I'm concerned with the way I present myself" and "I usually worry about making a good impression," people scoring highly on this measure tend to report an increased awareness of how they are regarded by others and attach considerable importance to another person's impressions of them. Public self-consciousness (hereinafter referred to simply as self-consciousness) has been shown to correlate with social anxiety in several studies (e.g., Hope & Heimberg, 1988; Leary & Kowalski, 1995).

As would be predicted on the basis of the two-factor model of social anxiety, the combination of both high-self-focus and negative social expectancies tends to produce the most pronounced evaluative distress and social

anxiety. In an early study, Fenigstein (1979) used the scale to designate female undergraduate participants as high- or low-self-conscious and had them undergo a social interaction where they were snubbed by two experimental confederates. He found that women high in self-consciousness displayed a more negative reaction to the social rejection and greater desire to avoid further interaction with the confederates than did those low in self-consciousness. Similar results have been reported by Alden, Teschuk, and Tee (1992) and Burgio, Merluzzi, and Pryor (1986). The current research also builds on some previous studies of self-evaluations in testing situations, in which visualization primes of accepting and critical relational schemas were found to have more impact where self-awareness also was induced experimentally (Baldwin, 1994, Study 2; Baldwin & Holmes, 1987, Study 2). In our study of social interaction, therefore, we chose to compare the reactions of high- versus low-self-conscious individuals to the cued activation of relational information.

The Current Studies

In both studies, a conditioning procedure was used to associate expectations of acceptance and rejection with different computer-generated tones. In the pilot study, the effects of this procedure were examined using a lexical decision task to establish that later presentation of the conditioned tones activated thoughts of acceptance and rejection. In the main study, the same procedure was used to activate relational knowledge during an initial, potentially anxiety-producing meeting between a woman and a man. We sought to test whether a knowledge activation procedure would have an impact in this context.

PILOT STUDY

In a pilot study, we examined the cued activation procedure using a lexical decision task (Meyer & Schvaneveldt, 1971) to establish whether the conditioned tones would indeed activate acceptance and rejection information. In previous research using the lexical decision task (Baldwin & Sinclair, 1996), participants performed word/nonword judgments on a range of targets, including words representing interpersonal acceptance (e.g., liked, accepted) and rejection (e.g., criticized, rejected). This task is thought to reveal the accessibility of different schemas or constructs: Words that correspond to cognitively accessible content produce shorter reaction times because the individual is quicker to recognize them as words. A sequential-priming version of the task builds on the principle of spreading activation to assess the associations the individual perceives among different constructs. In the studies by Baldwin and Sinclair, each trial began with a prime word representing either

success or failure. Consistent with a view of low self-esteem as resulting from the perception that acceptance from others is conditional or contingent on successful performances (e.g., Rogers, 1959), low-self-esteem individuals were quicker to recognize rejection targets when primed with failure and quicker to recognize acceptance targets when primed with success.

Baldwin and Meunier (1999) extended this research by examining cued activation. Cues were established during a brief conditioning phase in which participants visualized either a contingently or noncontingently accepting significant other while a computer repeatedly emitted a distinctive sequence of tones. When the tone sequence was played again later during the lexical decision task, reaction times reflected the activated interpersonal context. For example, when the tone that had been paired with a contingent relationship was played, people were quicker to recognize rejection targets when primed with failure or acceptance targets when primed with success.

In the current pilot study, we used a modified version of this task to test for the direct associations we were trying to establish between a conditioned stimulus and the anticipation of acceptance or rejection. We first used a conditioning paradigm to create cues (distinctive tone sequences) for either rejection or acceptance. Then, in a lexical decision task, participants heard one cue or the other and performed word-nonword judgments on acceptance or rejection targets. We predicted an interaction effect whereby the conditioned stimulus for acceptance (hereinafter the CS-acceptance) would facilitate reaction times (RTs) to acceptance words (compared to the CS-rejection) but slow down RTs to rejection words. This would demonstrate the cued activation of interpersonal expectancies.

METHOD

Participants

Thirteen McGill University undergraduate students (7 women, 6 men, with a median age of 21 years) participated and received $8 (Cdn.) in compensation. Data from 1 female participant were dropped from analyses because she made errors on more than 20% of the word trials.

Procedure

Participants were informed by the female experimenter that they were in a study about cognitive styles and attitudes that would involve a number of different tasks. First was the conditioning procedure, developed by Baldwin et al. (2001), which consisted of an attitude questionnaire on a computer. This questionnaire presented a series of benign multiple choice questions (e.g.,

"What is your favorite flavor of ice cream?"). Participants were told that the questions had been pretested with other students, asking them which answers they would like someone to give, and the goal of the present study was to see if the participants' opinions actually lined up with these socially desirable answers. Earlier research by Baldwin et al. showed that participants find this a plausible, compelling exercise. As they responded to questions, they were given bogus feedback on every third trial: Feedback consisted of a 1-second presentation of a row of two male and two female faces smiling in approval, to indicate that their answers were matching the ideal, or a row of frowning faces, to indicate that their answers were not matching the ideal. The feedback was in fact given in a fixed random order, unrelated to the participants' responses. Each time feedback was given it was signaled 1.5 seconds in advance by one of two distinctive 1-second tone sequences: either a high-pitched doorbell sound or a low-pitched sequence of tones that increased in pitch. Thus, after the 60-item questionnaire, which took approximately 15 minutes to complete, the participants had received 10 acceptance trials signaled by one tone sequence, the CS-acceptance, and 10 rejection trials signaled by the other tone sequence, the CS-rejection (tones were counterbalanced across participants). Following this task, all participants performed a 2-minute distractor task, which consisted of a paper-and-pencil word-search puzzle.

Participants then performed a 96-trial lexical decision task in which they made word/nonword judgments of a series of targets. On each trial, the computer played one of the tone sequences and immediately after presented a letter string that was either a word or a nonword. The participant responded by pressing one of two keys as quickly as possible to indicate whether the target string was a word or nonword. This task was divided into three blocks. In one block, the presentation of the target string on each trial was signaled by the CS-acceptance, in another block the CS-rejection, and in another block a novel tone sequence (CS-control). The tones were characterized as orienting cues to help them stay focused on the task. The order of blocks was counterbalanced across participants. Within each block, there were four acceptance target words and four rejection target words. There were also four positive, but noninterpersonal, words (e.g., tranquil, amuse) and four negative but noninterpersonal words (e.g., slavery, decay) included as control stimuli. The 16 word trials were interspersed randomly with 16 nonword trials. All targets were presented only once to each participant; the targets assigned to each block were randomly selected for each participant from a longer list of targets (see Baldwin & Sinclair, 1996, for a more detailed description of the lexical decision procedure).

Following the lexical decision task, participants filled out a battery of questionnaires that were administered for exploratory purposes. They were then debriefed, paid, and thanked for their participation. Debriefing confirmed that although participants were aware of the contingency between the tones and the social feedback during the conditioning phase of the study, they soon realized that during the lexical decision task, each tone was equally likely to be followed by either an acceptance or rejection target word and so they were not suspicious about the use of the tones as signals during the task.

RESULTS AND DISCUSSION

Participants gave an incorrect response or took longer than the 2 seconds allowed on an average of 1.63 (out of 48) word trials. These error trials were discarded and mean RTs for each stimulus condition (i.e., CS-acceptance, acceptance words; CS-acceptance, rejection words; and so on) were calculated based on correct responses.

The interpersonal targets were analyzed in a 2 (tone condition: CS-acceptance vs. CS-rejection) × 2 (target words: acceptance vs. rejection) within-participants ANOVA. As predicted, the only significant effect was the interaction between the CS condition and the nature of the target words, $F(1, 11) = 7.69$, $p = .02$ (note that this effect was unchanged if RTs[1] in the corresponding CS-control condition, or those for noninterpersonal targets, were included as covariates, and this interaction effect was not significant in a similar analysis of the noninterpersonal targets, $F < 1.5$). As predicted, a planned comparison showed that rejection words were identified 90 milliseconds more quickly after the presentation of the CS-rejection ($M = 697.05$, $SD = 131.02$) than after the presentation of the CS-acceptance ($M = 787.77$, $SD = 154.61$), $t(11) = 2.86$, $p < .01$, one tailed.[2] Contrary to predictions, although the means were 9 ms in the anticipated direction, acceptance targets were not significantly more quickly identified after the CS-acceptance ($M = 705.51$, $SD = 171.40$) than after the CS-rejection ($M = 714.65$, $SD = 176.04$), $t < 1$.

As predicted, then, the lexical decision task revealed the cued activation of interpersonal knowledge as a result of a brief conditioning procedure. Other social psychological work on human conditioning (e.g., Krosnick, Betz, Jussim, & Lynn, 1992; Murphy & Zajonc, 1993) and affective associations (e.g., Fazio, Sanbonmatsu, Powell, & Kardes, 1986; Greenwald, McGhee, & Schwartz, 1998) often has been limited to examining the overall valence of affective responses. The lexical decision task allows the researcher to present target stimuli that are more specific in their social content, in this case relating to rejection and acceptance; it was only on these targets, and not the noninterpersonal

targets, that effects were observed. Since Tolman's (1932; see also Bolles, 1972; Dickinson, 1989) seminal article, associative learning in the type of conditioning paradigm used here often has been characterized as the generation of expectancies about which type of experiences tend to follow certain events. This analysis fits well with our general assumption that activation of various cues can spread to representations of social outcomes (see Baldwin & Sinclair, 1996, for further discussion). In this study, the effect was accounted for primarily by rejection targets, indicating that what was being learned was the presence or absence of a negative outcome (i.e., rejection) rather than the presence or absence of a positive outcome (i.e., acceptance). This finding is consistent with the notion that anxiety—in this case, social anxiety—is the emotional response to the anticipation of a negative outcome—in this case, social rejection (e.g., Higgins, 1987).

MAIN STUDY

In the main study, we examined the impact of the cued activation of interpersonal knowledge on an ongoing interaction. Past research has shown that an interaction with a self-confident member of the other sex can serve as a powerful manipulation of social anxiety (Burgio et al., 1986; Melchoir & Cheek, 1990). Because of a gender difference observed in some previous cued-activation research (Baldwin, Granzberg, Pippus, & Pritchard, 2001), and also consistent with earlier social anxiety research focusing on women (e.g., Alden et al., 1992; DePaulo, Epstein, & LeMay, 1990), we studied the impact of the cues while female participants conversed with a male confederate. We hypothesized that those women who interacted while the cue for acceptance played would rate themselves as less anxious than those who interacted while the cue for rejection played. Based on Schlenker and Leary's (1982) two-factor model, however, we also anticipated that the activation effect would be qualified by an interaction between activation condition and level of premeasured self-consciousness: We predicted that highly self-conscious participants would be most affected by the evaluative cues.

Undergraduate women first underwent the conditioning procedure described in Study 1. Shortly thereafter, they had a 5-minute interaction with a male confederate who acted rather cool and aloof while one of the CS tones played in the background. We predicted that participants would be more comfortable if the CS-acceptance was playing and more anxious if the CS-rejection was playing. This effect was expected to be especially pronounced for high-self-conscious individuals, who tend to be chronically focused on themselves and the impression they are making on others.

METHOD

Participants

Fifty-six female introductory psychology students at the University of Manitoba served as participants in the experiment, receiving course credit for their participation. In a series of mass-testing sessions approximately 4 months earlier in the term, they completed the Self-Consciousness Scale (Fenigstein et al., 1975) in a questionnaire packet that included other measures not used in this study. Data were discarded from 3 participants who did not fill out the pretest questionnaire.

Procedure

Participants were given the same instructions, and underwent the same conditioning procedure, as described in the pilot study. After this conditioning phase, the participant moved to a different desk on the other side of the room and completed a 5-minute filler task of word puzzles. During this time, the female experimenter worked at the computer, ostensibly developing a new program.

Participants were then informed that they would engage in a brief conversation with a male experimenter, with the only restriction on their conversation being that they were not allowed to talk about the experiment. The experimenter then left the room to summon him. After a short period of time, the computer she had been working on began repeatedly, at 5-second intervals, emitting one of three tone sequences: one of the two tones from the bogus attitude questionnaire or else a third novel tone as a control condition. These three conditions represent the activation manipulation.

The male experimenter, who was actually a well-dressed senior undergraduate confederate, then arrived to carry on the 5-minute conversation. Following the procedure used by Stopa and Clark (1993; see also Alden et al., 1992; Burgio et al., 1986) to induce social anxiety, the confederate was instructed to behave in a reserved, but not unfriendly, way, allowing uncomfortable pauses to occur and not introducing new topics of conversation unless there was a pause of longer than 30 seconds. During the conversation, only a few participants mentioned the tones from the computer on the other side of the room; the confederate remarked that the experimenter must have been working on it. Most participants said later that they noticed the tones but tried to ignore them in order to focus on keeping the conversation going. As intended, participants generally reported that the conversation was rather uncomfortable.

Following the conversation, participants were asked to complete a number of dependent measures. The first measure was a mood scale. This 43-item scale included 20 adjectives from the Positive and Negative Affect

Schedule (Watson, Clark, & Tellegen, 1988), 15 self-evaluative mood items used by McFarland and Ross (1982), and 8 items drawn from the anxiety subscale of the Multiple Affect Adjective Check List (Zuckerman & Lubin, 1965). The second measure was the 23-item Behaviour Checklist (Stopa & Clark, 1993), which asked participants to rate their behavior during the interaction on items such as nervous, confident, blushing, self-assured, and awkward. Next, participants completed the State Self-Esteem Scale, which contains items such as, "I feel inferior to others at this moment" and "I feel good about myself" (Heatherton & Polivy, 1991). Finally, participants completed a reflected-appraisal measure devised by Ryan, Plant, and Kuczkowski (1991). They rated how they thought the confederate would rate them on 14 adjectives (interesting, active, stupid, unfriendly, happy, passive, boring, intelligent, sad, friendly, shy, confident, insecure, and outgoing). After participants completed these questionnaires, they were debriefed by the female experimenter and thanked for their participation. No participant expressed suspicion about the presence of the tones during the interaction.

The confederate also completed two questionnaires following each interaction with participants. First, he completed a parallel form of the Behavior Checklist (Stopa & Clark, 1993), rating the participant's behavior during the interaction. Next, he completed the same reflected appraisal measure that participants completed (Ryan et al., 1991), except the confederate completed this scale according to how he saw the participant. The confederate was blind throughout to which tone sequence had been paired with which type of feedback for each participant.

RESULTS

Consistent with the analytic approach used in other social anxiety studies (e.g., Burgio et al., 1986; DePaulo et al., 1990) and to allow comparability with experimental manipulations of self-focus (e.g., Alden et al., 1992; Burgio et al., 1986; Fenigstein, 1979), participants were designated as high or low in self-consciousness following a median split procedure.

Initial analyses revealed that the self-report measures of mood, behavior, self-esteem, and reflected appraisals were highly intercorrelated, average pairwise $r = .70$. A self-report index was therefore calculated by first coding all measures such that higher numbers represented positive ratings (i.e., meaning less anxious, more poised, higher in state self-esteem, and with a more positive expectation of the confederate's appraisal) and then standardizing and summing across measures. This index ($\alpha = .86$) was then analyzed using a 3 (condition: control,

CS-acceptance, or CS-rejection) × 2 (self-consciousness: high vs. low) analysis of variance.

The activation manipulation affected participants' self-reported comfort during the conversation, as shown by a significant main effect for activation condition, $F(2, 47) = 4.23$, $p < .05$. Self-consciousness also played a role in social anxiety reactions because, not surprisingly, high-self-conscious individuals reported less comfort during this awkward interaction than their low-self-conscious counterparts, $F(1, 47) = 12.25$, $p < .001$. These main effects were qualified by the predicted interaction between activation condition and self-consciousness, $F(2, 47) = 6.30$, $p < .01$. Planned comparisons showed that, as depicted in Figure 1, high-self-conscious individuals reported less comfort if the CS-rejection tone was playing ($M = -4.77$, $SD = 2.64$), compared with the control condition ($M = -1.97$, $SD = 2.37$), $t(47) = 1.86$, $p < .05$. High-self-conscious individuals also reported greater comfort if the CS-acceptance tone was playing ($M = 1.87$, $SD = 2.13$), compared with controls, $t(47) = 2.84$, $p < .01$; indeed, in this condition, their ratings were at least as positive as those of low-self-conscious individuals. For their part, low-self-conscious individuals were not affected by the activation conditions, $ts < 1$, ns, reporting fairly high levels of comfort across the board. This critical interaction effect, whereby high-self-conscious individuals were affected by the activation manipulation but low-self-conscious individuals were not, also was significant across the four univariate analyses (see Table 1).

Confederate's Ratings

We were interested in whether participants' insecurity would be apparent to their interaction partner or would be limited to internal states. The two sets of ratings filled out by the confederate were highly correlated, $r(52) = .87$, $p < .001$, and therefore were combined into a single index. There were no main effects on this index; however, the interaction term was marginally significant, $F(2, 48) = 2.60$, $p = .085$. As can be seen in Table 1, the interaction was significant for the confederate's ratings of how poised the participant's interactive behaviors were. Comparisons of cell means showed no significant differences on either the index or the univariate behavior ratings. The significant interaction effect, therefore, was not attributable to one specific comparison of an experimental group with its control condition. The overall pattern, however, was generally similar to that of the participants' self-ratings, and the two indices were significantly correlated, $r(51) = .58$, $p < .001$. Thus, the effects of cued activation and self-consciousness on participants' social anxiety levels were evident in their behavior, as observed by their interaction partner, as well as in their internal state.
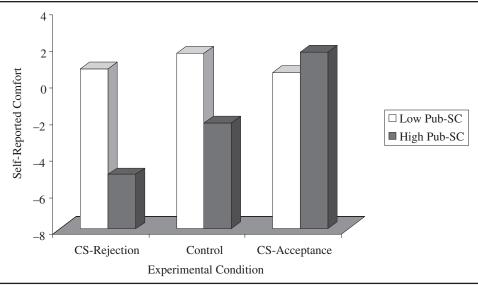
Figure 1   Index of self-reported comfort by activation condition and public self-consciousness.
NOTE: CS-Rejection = conditioned stimulus for rejection, CS-Acceptance = conditioned stimulus for acceptance, Low Pub-SC = low public self-conscious, and High Pub-SC = high public self-conscious.

TABLE 1:   Self-Reports and Confederate Ratings as a Function of Activation Condition and Level of Self-Consciousness

| | Activation Condition | | | | | | F Values | | |
| | CS-Rejection | | Control | | CS-Acceptance | | | | |
Measure	Lo-SC	Hi-SC	Lo-SC	Hi-SC	Lo-SC	Hi-SC	Condition	Self-Consciousness	Interaction
Self-reports									
Mood									
M	153.91	126.83	157.10	146.75	153.13	158.70	4.23**	6.45**	5.56***
SD	17.38	11.25	15.14	13.48	13.99	10.52			
Behavior									
M	112.82	66.67	117.03	88.22	116.21	114.61	3.65**	11.91***	3.17**
SD	25.40	13.26	28.78	25.67	28.37	26.77			
Self-esteem									
M	76.36	58.67	81.40	65.00	74.63	74.22	1.77	15.07****	3.63**
SD	10.48	13.41	6.15	12.97	9.29	10.89			
Reflected appraisals									
M	68.91	51.33	70.20	56.78	66.76	74.89	2.53*	4.24**	4.58**
SD	16.19	10.17	14.40	8.71	13.66	12.60			
Confederate ratings									
Behavior									
M	113.64	95.83	113.60	101.33	97.38	113.10	.02	.57	3.17**
SD	23.70	11.11	22.21	13.69	20.15	26.10			
Evaluative appraisals									
M	71.57	63.50	71.00	66.78	63.13	71.70	.03	.07	1.81
SD	14.78	9.05	12.05	9.81	15.64	15.89			

NOTE: Higher numbers represent more positive scores on all measures. CS-Rejection = conditioned stimulus for rejection, CS-Acceptance = conditioned stimulus for acceptance, Lo-SC = low self-conscious, and Hi-SC = high self-conscious.
*$p < .01$. **$p < .05$. ***$p < .01$. ****$p < .001$.

DISCUSSION

The results across a number of measures demonstrated the impact of knowledge activation during interpersonal interactions. Activated relational knowledge and level of self-consciousness combined together to determine levels of social anxiety, as predicted on the basis of Schlenker and Leary's (1982) two-factor model. In particular, high-self-conscious individuals rated their behavior and mood more negatively in the CS-rejection condition and more positively in the CS-acceptance condition, with the control condition in between; low-self-conscious individuals showed little if any impact of the

activation manipulation, reporting minimal anxiety irrespective of experimental condition.

For high-self-conscious individuals, then, the mere sound of a computer tone on the other side of the room had an impact on how they felt and acted when meeting a stranger. For these participants, concerned with the impression they were making, application of activated relational knowledge to their current situation had an effect on their mood, self-esteem, and poise during an initial encounter. Thus, as proposed by Schlenker and Leary (1982), social anxiety was most evident for people who tended to be focused on the impression they were making and had negative expectancies about how they would be received by their interaction partner. By contrast, in the condition where the manipulation activated positive expectancies, social anxiety was absent. As in previous research using experimental manipulations of self-focus, there was little impact of the activation manipulation on low-self-conscious individuals. These people are not inclined to focus on or be concerned about the impression they are making on others and therefore did not show changes in their typically low level of anxiety regardless of activation condition.

Although the planned contrasts revealed effects for both the CS-rejection and CS-acceptance conditions, compared to the control condition, casual examination of the univariate means in Table 1 indicates that the effect was somewhat more robust for the CS-acceptance. When one takes into account the finding of the pilot study that the lexical decision effects were mostly observed on rejection targets, it suggests the intriguing possibility that when people are in an anxiety-producing situation, they are most strongly influenced by cues signaling safety from negative outcomes (see, e.g., Seligman & Binik, 1977). A similar idea has been suggested in the adult attachment literature by Mikulincer and Arad (1999) in their discussion of the "secure base" function served by attachment working models. Future research is required to determine conditions in which acceptance or rejection cues will have more impact.

One caveat is in order regarding the generalizability of these findings to men as well as women. We elected to study women in this experiment partly because in some of our previous test-anxiety research with the conditioning procedure (Baldwin et al., 2001), we have found a gender difference such that whereas women showed straightforward activation effects, men occasionally did not or even showed opposite effects indicating defensiveness. Although the possibility therefore exists that our current findings are not relevant to social anxiety in men, we suspect that gender differences may have to do with the content of social evaluations rather than the basic processes involved. That is, one study by Baldwin et al. found that the gender difference in the test-anxiety studies was due to different emphases placed by men and women on agency and performance as a source of self-, and presumably social, evaluation. Therefore, in the current social interaction situation, we expect that the conditioning procedure would have similar effects on men and women so long as the social feedback was based on the kinds of self-aspects (e.g., attitudes, values, performances) that the participant believes typically lead to acceptance or rejection. The impact of specific social expectancies on social anxiety is a topic deserving of additional research.

An alternative account of our findings follows from previous research and clinical observation that has indicated that trait anxiety is correlated with the speed of acquisition and generalization of punishment expectancies (e.g., Eysenck, 1965; Wenar, 1954; Zinbarg & Mohlman, 1998). Perhaps, then, only the highly self-conscious individuals learned the contingency, which is why only they showed the impact of the cue. This likely does not apply to the current findings, however. The Self-Consciousness Scale (Fenigstein et al., 1975) has two other subscales in addition to the public self-consciousness measure studied here. Exploratory analyses based on both private self-consciousness and chronic social anxiety—the latter being the most direct indicator of anxiety—showed some main effects on the dependent measures (e.g., chronically socially anxious people reported lower state self-esteem) but no significant interaction effects involving the conditioning manipulation. Thus, only public self-consciousness, the indicator of impression motivation, interacted with the activation of social expectancies.

GENERAL DISCUSSION

The results of the two studies attest to the value of taking a social cognitive view of social anxiety and relational phenomena in general. The fact that the tones produced any effects at all, particularly on social anxiety and interactive behavior, demonstrates a number of important points. First, it demonstrates the profound tendency of people to attend to and learn the contingencies of interpersonal acceptance and rejection (e.g., Safran, 1990; Sullivan, 1953). The tone sequences were associated to acceptance and rejection through just 10 trials each, and counterbalancing ensured that there was nothing about the tones per se that could account for the findings.

Second, the results illustrate the powerful impact of activated relational knowledge. Often, problems such as social anxiety, as well as related characteristics such as low self-esteem and insecure attachment, are considered to be rather immutable traits that are learned early in life and inevitably expressed in all later relationships. Although individual differences undoubtedly provide a

backdrop of chronic tendencies, the current findings along with related results in the self-esteem and attachment domains have shown that the momentary, temporary accessibility of relational knowledge can have a profound effect on perceptions, feelings, and interpersonal behaviors. As mentioned earlier, we know that direct priming manipulations involving reminding an individual of a critical or accepting significant other can produce shifts in self-evaluation and interaction intentions (e.g., Baldwin et al., 1996; Baldwin & Holmes, 1987; Baldwin & Sinclair, 1996). Another line of research by Andersen and colleagues (see Andersen & Berk, 1998) on a social cognitive interpretation of transference has shown that activation of a schema often occurs because a stranger shares some features with a significant other that serve as cues or triggers for the structure. Based on these minimal cues, participants often go beyond the information given to assume that the new person will have a range of other characteristics associated with the significant other: They even expect this new person to be accepting or rejecting, or pleasant versus unpleasant to interact with, to the same degree as the significant other. The current findings show that the trigger for such activation need not be a feature of the new person but rather can be a relatively incidental environmental cue. In this case, a computer tone activated relational expectancies to influence people's mood and self-esteem, their reflected appraisals of how they thought their interaction partner saw them, and even the way their partner did in fact see them. These kinds of effects of activated structures are commonplace in the social cognitive literature and are highly consistent with the cardinal features of social anxiety, such as the perceptions of ambiguous feedback as rejecting (e.g., Pozo, Carver, Wellens, & Scheier, 1991) or beliefs that others hold unreachable standards (e.g., Wallace & Alden, 1991). The finding that such social expectancies can be activated by minimal environmental cues underscores the value of taking a social cognitive approach to studying the mechanisms underlying both temporary and chronic tendencies to experience social anxiety (see, e.g., Baldwin & Fergusson, in press).

Finally, social anxiety causes significant interpersonal distress for a large population, and our findings are relevant to the issue of change in relational knowledge activation. We assume (see, e.g., Baldwin et al., 1996; Baldwin & Fergusson, in press) that people generally have multiple models of different kinds of relationships and interactions, which can be cued by all manner of triggers. Therapy often is directed at detecting and modifying those triggers. The treatment of social anxiety has varied extensively over the decades, but some combination of cognitive and behavioral therapies is often used.

A key ingredient in most therapies is exposure (Edelmann, 1992; Heimberg & Barlow, 1991; Taylor & Arnow, 1988), in which clients gradually experience each of several feared situations in the absence of aversive consequences. These treatments are partially based on the notion of redefining the cues in the situation that become associated with anxiety, as well as modifying the specific cognitions that commonly occur in anxiety-provoking situations. Recent work on the mechanisms of exposure therapies and extinction (see, e.g., Bouton, 1991), however, has shown that it is not enough to learn a new way of seeing things; for example, social interactions do not always lead to failure or social mistakes or awkwardness do not always lead to rejection and humiliation. What also must happen in a successful intervention is that the newly learned, positive structures are more likely to be activated during a social interaction rather than the old, dysfunctional structures. The important factor, then, is activation—what script or relational schema gets activated at the time of performance. Thus, as Brewin (1989) pointed out, research into therapeutic change needs to focus on changes in knowledge activation and the cues that can trigger positive rather than negative expectations. The current paradigm could prove quite useful in this task. We would not advocate a direct application to therapy: Social success would hardly be facilitated by the periodic sound of a doorbell tone emanating from a handheld computer. Techniques could be developed, however, to try to reconfigure the relational knowledge that is activated by particular situations or particular sensations (see, e.g., Baldwin & Fergusson, in press).

In the broader scheme of things, the current research is in part a response to calls for a truly social cognition that focuses on cognition about interpersonal relationships rather than social objects such as self and other in isolation (Baldwin, 1992, 1995; Fiske & Haslam, 1996). It also fits with the agenda of pursuing more experimental rather than correlational research in the field of close relationships (e.g., Clark & Reis, 1988). The results demonstrate that it is possible to manipulate social cognitive mechanisms in a relatively subtle manner via environmental cues to produce fairly dramatic emotional and even interpersonal effects. If our interactions and relationships are shaped to this degree by shifts in knowledge activation, future research should examine in detail the principles that determine which social knowledge structures become cued for which individuals in which situations.

NOTES

1. The 2-s cutoff for reaction times was used to avoid skewness in the data, which is common if reaction times are not limited in this way. To

control for any remaining skewness, the critical analyses were redone following a log transformation of the raw reaction times (RTs). The interaction was slightly weaker, $F(1, 11) = 4.16$, $p = .066$, but the critical contrast comparing rejection targets in the two priming conditions remained significant, $t(11) = 2.60$, $p < .02$.

2. All planned comparisons between means are one-tailed tests.

REFERENCES

Alden, L. E., Teschuk, M., & Tee, K. (1992). Public self-awareness and withdrawal from social interactions. *Cognitive Therapy and Research, 16*, 249-267.

Andersen, S. M., & Berk, J. S. (1998). Transference in everyday experience: Implications of experimental research for relevant clinical phenomena. *Review of General Psychology, 2*, 81-120.

Baldwin, M. W. (1992). Relational schemas and the processing of social information. *Psychological Bulletin, 112*, 461-484.

Baldwin, M. W. (1994). Primed relational schemas as a source of self-evaluative reaction. *Journal of Social and Clinical Psychology, 13*, 380-403.

Baldwin, M. W. (1995). Relational schemas and cognition in close relationships. *Journal of Social and Personal Relationships, 12*, 547-552.

Baldwin, M. W., Carrell, S. E., & Lopez, D. F. (1990). Priming relationship schemas: My advisor and the pope are watching me from the back of my mind. *Journal of Experimental Social Psychology, 26*, 435-454.

Baldwin, M. W., & Fergusson, P. (in press). Relational schemas: The activation of interpersonal knowledge structures in social anxiety. In R. Crozier & L. Alden (Eds.), *International handbook of social anxiety*. Sussex, UK: Wiley.

Baldwin, M. W., Granzberg, A., Pippus, L., & Pritchard, E. T. (2001). *Cued activation of relational schemas: Self-evaluation and gender effects.* Manuscript submitted for publication.

Baldwin, M. W., & Holmes, J. C. (1987). Salient private audiences and awareness of the self. *Journal of Personality and Social Psychology, 52*, 1087-1098.

Baldwin, M. W., Keelan, J.P.R., Fehr, B., Enns, V., & Koh-Rangarajoo, E. (1996). Social cognitive conceptualization of attachment working models: Availability and accessibility effects. *Journal of Personality and Social Psychology, 71*, 94-104.

Baldwin, M. W., & Meunier, J. (1999). The cued activation of attachment relational schemas. *Social Cognition, 17*, 209-227.

Baldwin, M. W., & Sinclair, L. (1996). Self-esteem and "if . . . then" contingencies of interpersonal acceptance. *Journal of Personality and Social Psychology, 71*, 1130-1141.

Bargh, J. A., & Ferguson, M. J. (2000). Beyond behaviorism: On the automaticity of higher mental processes. *Psychological Bulletin, 126*, 925-945.

Bolles, R. C. (1972). Reinforcement, expectancy, and learning. *Psychological Review, 95*, 394-409.

Bouton, M. E. (1991). A contextual analysis of fear extinction. In P. R. Martin (Ed.), *Handbook of behavior therapy and psychological science* (pp. 435-453). New York: Pergamon.

Brewin, C. R. (1989). Cognitive change processes in psychotherapy. *Psychological Review, 96*, 379-394.

Burgio, K. L., Merluzzi, T. V., & Pryor, J. B. (1986). Effects of performance expectancy and self-focused attention on social interaction. *Journal of Personality and Social Psychology, 50*, 1216-1221.

Clark, M. S., & Reis, H. T. (1988). Interpersonal processes in close relationships. *Annual Review of Psychology, 39*, 609-672.

DePaulo, 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.

Dickinson, A. (1989). Expectancy theory in animal conditioning. In S. Klein & R. R. Mowrer (Eds.), *Contemporary learning theories: Pavlovian conditioning and the status of traditional learning theory* (pp. 279-308). Hillsdale, NJ: Lawrence Erlbaum.

Edelmann, R. J. (1992). *Anxiety: Theory, research and intervention in psychology*. West Sussex, UK: Wiley.

Eysenck, H. J. (1965). Extraversion and the acquisition of eye blink and GSR conditioned responses. *Psychological Bulletin, 63*, 258-270.

Fazio, R. H., Sanbonmatsu, D. M., Powell, M. C., & Kardes, F. R. (1986). On automatic activation of attitudes. *Journal of Personality and Social Psychology, 50*, 229-238.

Fenigstein, A. (1979). Self-consciousness, self-attention, and social interaction. *Journal of Personality and Social Psychology, 37*, 75-86.

Fenigstein, A., Scheier, M. F., & Buss, A. H. (1975). Public and private self-consciousness: Assessment and theory. *Journal of Consulting and Clinical Psychology, 43*, 522-527.

Fiske, A. P., & Haslam, N. (1996). Social cognition is thinking about relationships. *Current Directions in Psychological Science*, 143-148.

Greenwald, A. G., McGhee, D. E., Schwartz, J.L.K. (1998). Measuring individual differences in implicit cognition: The implicit association test. *Journal of Personality & Social Psychology, 74*, 1464-1480.

Hartmann, L. M. (1983). A metacognitive model of social anxiety: Implications for treatment. *Clinical Psychological Review, 3*, 435-456.

Heatherton, T. F., & Polivy, J. (1991). Development and validation of a scale for measuring state self-esteem. *Journal of Personality and Social Psychology, 60*, 895-910.

Heimberg, R. G., & Barlow, D. H. (1991). New developments in cognitive-behavioral therapy for social phobia. *Journal of Clinical Psychiatry, 52*, 21-29.

Higgins, E. T. (1987). Self-discrepancy: A theory relating self and affect. *Psychological Review, 94*, 319-340.

Hope, D. A., & Heimberg, R. G. (1988). Public and private self-consciousness and social phobia. *Journal of Personality Assessment, 52*, 626-639.

Ingram, R. E., & Kendall, P. C. (1987). The cognitive side of anxiety. *Cognitive Therapy and Research, 11*, 523-536.

Krosnick, J. A., Betz, A. L., Jussim, L. J., & Lynn, A. R. (1992). Subliminal conditioning of attitudes. *Personality and Social Psychology Bulletin, 18*, 152-162.

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

McFarland, C., & Ross, M. (1982). Impact of causal attributions on affective reactions to success and failure. *Journal of Personality and Social Psychology, 43*, 937-946.

Melchoir, L. A., & Cheek, J. M. (1990). Shyness and anxious self-presentation during a social interaction [Special issue: Communication, cognition, and anxiety]. *Journal of Social Behavior and Personality, 5*, 117-130.

Meyer, D., & Schvaneveldt, R. W. (1971). Facilitation in recognizing pairs of words: Evidence of a dependence between retrieval operations. *Journal of Experimental Psychology, 90*, 227-234.

Mikulincer, M., & Arad, D. (1999). Attachment working models and cognitive openness in close relationships: A test of chronic and temporary accessibility effects. *Journal of Personality & Social Psychology, 77,* 710-725.

Murphy, S. T., & Zajonc, R. B. (1993). Affect, cognition, and awareness: Affective priming with optimal and suboptimal stimulus exposures. *Journal of Personality and Social Psychology, 64*, 723-739.

Pozo, C., Carver, C. S., Wellens, A. R., & Scheier, M. F. (1991). Social anxiety and social perception: Construing others' reactions to the self. *Personality and Social Psychology Bulletin, 17*, 355-362.

Rogers, C. R. (1959). Therapy, personality and interpersonal relationships. In S. Koch (Ed.), *Psychology: A study of a science* (Vol. 3). Toronto, Canada: McGraw-Hill.

Ryan, R. M., Plant, R. W., & Kuczkowski, R. J. (1991). Relation of self-projection processes to perform, emotion, and memory in a controlled interaction setting. *Personality and Social Psychology Bulletin, 17*, 427-434.

Safran, J. D. (1990). Towards a refinement of cognitive therapy in light of interpersonal theory: I. Theory. *Clinical Psychology Review, 10*, 87-103.

Schlenker, B. R., & Leary, M. R. (1982). Social anxiety and self-presentation: A conceptualization and model. *Psychological Bulletin, 92*, 641-669.

Seligman, M., & Binik, Y. (1977). The safety signal hypothesis. In H. Davis & H. Hurwitz (Ed.), *Pavlovian-operant interactions* (pp. 165-187). Hillsdale, NJ: Lawrence Erlbaum.

Stopa, L., & Clark, D. N. (1993). Cognitive processes in social phobia. *Behavior Research and Therapy, 31*, 255-267.

Sullivan, H. S. (1953). *The interpersonal theory of psychiatry.* New York: Norton.

Taylor, C. B., & Arnow, B. (1988). *The nature and treatment of anxiety disorders.* New York: Free Press.

Tolman, E. C. (1932). *Purposive behavior in animals and men.* New York: Appleton-Century-Crofts.

Wallace, S. T., & Alden, L. E. (1991). A comparison of social standards and perceived ability in anxious and nonanxious men. *Cognitive Therapy and Research, 15*, 237-254.

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

Wenar, C. (1954). Reaction time as a function of manifest anxiety and stimulus intensity. *Journal of Abnormal and Social Psychology, 49*, 335-340.

Wicklund, R. A. (1975). Objective self-awareness. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 8, pp. 233-275). New York: Academic Press.

Winton, E. C., Clark, D., & Edelmann, R. J. (1995). Social anxiety, fear of negative evaluation and the detection of negative emotion in others. *Behavior Research and Therapy, 33*, 193-196.

Zinbarg, R. E., & Mohlman, J. (1998). Individual differences in the acquisition of affectively valenced associations. *Journal of Personality and Social Psychology, 74*, 1024-1040.

Zuckerman, M., & Lubin, B. (1965). *The multiple affect adjective check list.* San Diego, CA: Educational and Industrial Testing Service.