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## Social Anxiety and the Recall of Interpersonal Information

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### Abstract

Sixty subjects classified as high or low in social anxiety participated in a structured heterosocial interaction under conditions of either high or low social-evaluative threat. Following the interaction, subjects were asked to recall detailed information about the interaction partner's appearance and the content of the conversation. Socially anxious subjects recalled less information and made more errors in recall than nonanxious subjects. Contrary to prediction, social-evaluative threat did not affect recall. Anxious subjects also reported greater self-focused attention during the interaction. High self-focused attention was associated with superior recall for nonanxious subjects but associated with more frequent omission errors for anxious subjects. Results support cognitive-behavioral formulations of social anxiety which propose that socially anxious individuals engage in self-focused thinking which may impair their ability to process social information.

Social anxiety is a common (Bryant & Trower, 1974; Pilkonis & Zimbardo, 1979) and potentially debilitating problem (Amies, Gelder, & Shaw, 1983; Heimberg, Dodge, & Becker, 1987). Recent research on social anxiety has focused on the cognitive aspects of socially anxious individuals, including their self-statement patterns. For example, socially anxious subjects report more negative (Cacioppo, Glass, & Merluzzi, 1979) and fewer positive (Heimberg, Acerra, & Holstein, 1985) self-statements than nonanxious subjects in anticipation of meeting a person of the opposite sex. Hartman (1984) has proposed that the self-statements of socially anxious individuals are related to four themes:

1. Thoughts of general social inadequacy.
2. Concerns that their anxiety will be visible to others.

3. Fear of negative evaluation.
4. Preoccupation with arousal or performance.

Sarason (1975) has labeled this pattern of self-focused, negative cognitions “anxious self-preoccupation.” Several studies suggest that socially anxious individuals are “anxiously self-preoccupied.” For instance, they exhibit excessive processing of information related to how they are viewed by others (Smith, Ingram, & Brehm, 1983), are excessively concerned with whether or not others will perceive their anxiety (McEwan & Devins, 1983), and report more self-focused and fewer other-focused thoughts during social interactions than nonanxious subjects (Hope, Heimberg, Zollo, Nyman, & O’Brien, 1987).

Various theories have proposed that anxious self-preoccupation interferes with social performance (Hartman, 1983; Heimberg et al., 1987). Hartman suggests that the socially anxious individual’s excessive focusing on his or her own cognitive, physiological, and behavioral processes is part of a feedback loop that distances the individual from the interaction and thus interferes with his or her ability to function adequately. Others (Buss, 1980; Fenigstein, Scheier, & Buss, 1975; Leary, 1983) have suggested that a particular type of self-focus—the awareness of oneself as a social object, typically referred to as public self-consciousness—is a prerequisite for the occurrence of social anxiety. Indeed, high public self-consciousness has been associated with sensitivity to interpersonal rejection (Fenigstein, 1979) and with poorer performance in a behavioral test (Hope & Heimberg, 1988), particularly when the individual has low expectancies for good social performance (Burgio, Merluzzi, & Pryor, 1986). Assuming a fixed capacity model of attention, any attention focused on the self necessarily detracts from the amount of attention available to focus on the other individual (Wine, 1971). Excessive self-focus should reduce an individual’s effectiveness in social interactions by preventing him or her from devoting adequate attention to the partner’s verbal and nonverbal behavior.

Only a few studies provide evidence that anxious self-preoccupation interferes with social functioning. For example, Heimberg et al. (1985) utilized Byrne’s (1971) attraction paradigm to examine socially anxious and nonanxious subjects’ evaluations of potential interaction partners. As has been repeatedly demonstrated for normal subjects, nonanxious subjects preferred potential partners whom they believed to have backgrounds and attitudes similar to their own. However, socially anxious subjects showed no preference for similar or dissimilar partners. In other words, they failed to perceive, recall, or utilize potentially important social information. In a recent study with high school boys, Johnson and Glass (1989) found that less task-focused attention was associated with higher judges’ ratings of anxiety and poorer verbal skills (less elaborate responses, fewer questions, etc.) during a heterosocial interaction. In another study, socially anxious individuals were less able to recall the characteristics of individuals to whom they had just been introduced (Kimble & Zehr, 1982).

Although these studies suggest that individuals high in social anxiety demonstrate deficits in processing social information, they do not explore the nature of such deficits during extended social interactions. Subjects in the Heimberg and associates study saw only background and attitude questionnaires which they believed to have been completed by the

potential interaction partner. Kimble and Zehr's subjects participated only in brief introductions. Johnson and Glass used a more extensive interaction but they examined self-statement patterns (cognitive content) rather than cognitive processes. Therefore the present study attempted to move away from self-statement analysis and examine the social information processing abilities of socially anxious and nonanxious individuals during a heterosocial interaction.

High and low socially anxious subjects were asked to recall information about their interaction partners following a moderately structured conversation. In order to examine whether the amount of anxiety subjects actually experienced during the interaction would be related to recall, the level of social-evaluative threat was also manipulated. It was predicted that socially anxious subjects would remember less information about their interaction partner than nonanxious subjects, particularly under conditions of high social evaluation. Furthermore, it was hypothesized that subjects who experienced the poorest recall would report the most self-focused attention during the interaction.

## **Method**

### *Subjects*

Subjects were 60 undergraduate women who completed the Social Avoidance and Distress Scale (SADS; Watson & Friend, 1969) as part of a battery of questionnaires administered during group testing sessions held at the beginning of the semester. The SADS is a commonly used measure of social anxiety (Heimberg, 1988) and was used to screen subjects for the study. Those scoring in the upper or lower quartile were telephoned and invited to participate in a study of "first impressions" in exchange for course credit. This procedure yielded 30 high ( $M = 14.10$ ,  $SD = 4.07$ ) and 30 low ( $M = 1.40$ ,  $SD = 1.08$ ) socially anxious subjects.

### *Procedure*

Subjects arrived at the laboratory for individual appointments and were seated in a small waiting area in which one of three male confederates was already seated. Signs requested that study participants wait without conversing. After approximately two minutes, the male experimenter entered the waiting area and asked both the subject and the confederate to give their informed consent. The experimenter then escorted the subject to a small room containing two chairs and video- and audio-recording equipment. The two chairs were facing each other but were situated so that only one was in view of the video camera.

Prior to arrival at the laboratory, subjects had been randomly assigned to one of two experimental conditions as a manipulation of state social anxiety. Subjects in the *evaluative condition* were seated facing the video camera and told that this was a study of the impressions women make on men when they meet for the first time. Therefore, each subject would be asked to make the best impression possible during a conversation with the man she had seen in the waiting area. The experimenter emphasized that her performance would be evaluated by the interaction partner and by the experimenter. The latter's evaluation would be based on a videotape of the interaction. (The videorecorder was never actually operative.)

Subjects in the *nonevaluative condition* heard a nearly identical script. However, the confederate was to be the target of evaluation, and the study was described as examining the impressions men make on women. Each subject was seated out of range of the camera and instructed that she was to serve as an objective observer and evaluate the man's ability to make a good first impression. The experimenter assured her that she would not be evaluated in any way and would not appear on the videotape. Following either the evaluative or nonevaluative instructions, the experimenter left the room, ostensibly to give instructions to the confederate.

Three minutes later, the experimenter and confederate returned. The experimenter seated the confederate in the empty chair and explained that the subjects were to "get to know one another" but that the research required that their conversation be structured. The experimenter handed out sheets listing 13 items grouped under six categories—Personal Information, Academic Information, Extracurricular Interests, Musical Preferences, Family Background, and Other (see Table 1). The confederate and subject were instructed to take turns providing the information in each category with the confederate speaking first. The importance of discussing only the assigned topics was emphasized and the participants were informed that this would be checked via audiotape. After questions were answered, the experimenter turned on the recording equipment and left the room. He returned four minutes later, turned off the equipment, and gave the subject the packet of questionnaires described below. The confederate left the room with the experimenter, ostensibly to complete his questionnaires separately. Finally, the subject was debriefed. This debriefing included assurance that no video-recording had been made and careful questioning as to whether she had suspected the interaction partner was a confederate. All subjects denied knowledge of the deception.

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**Table 1.** Topics Discussed during Structured Interactions

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*Personal Information*

Name, age, hometown

*Academic Information*

Class year, major, residence (on- or off-campus housing and dormitory or neighborhood)

*Extracurricular Interests*

Campus-based clubs or teams involved with, hobbies, or free-time interests

*Musical Preferences*

Favorite music (type and groups)

*Family Background*

Number of siblings, how it was "growing up"

*Other*

Opinion of the university, career interests

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### ***Confederates***

Three male undergraduate research assistants, blind to the specific hypotheses of the study and subjects' social anxiety level, served as confederates for the study. They were carefully trained to be neutral and consistent during the conversations. During training it became apparent that the confederates would be better able to handle unexpected questions from

the subjects if they provided personal information rather than using a script standardized for all three confederates. However, the confederates were coached to provide the same amount of information, and each confederate's personal script was standardized across subjects. Confederates' adherence to their scripts was periodically checked by the experimenter using audiotapes of the interactions. Confederates were counterbalanced across conditions.

### *Questionnaires*

#### *Recall Questionnaire*

Subjects' recall of the interaction was assessed with a 12-item questionnaire designed specifically for this study. Ten items elicited objective information provided by the confederate (e.g., "What is your partner's name?"), and two items requested physically descriptive information ("What color was your partner's hair?" and "Describe the shirt your partner wore"). Three topics included in the structured conversations (What it was like growing up, opinion of college, and career interests) were not included in the recall test. Because some items were worth more than one point (e.g., each confederate mentioned three extracurricular activities), possible scores ranged from 0 to 17.

#### *Self-Awareness*

A revised version of the Self-Consciousness Scale (SCS; Fenigstein et al., 1975) was used to assess the extensiveness of subjects' self-focused attention during the structured conversation. Two of the SCS subscales measure awareness of personal aspects that are either visible to others (*public self-consciousness*) or are internal events such as thoughts and feelings (*private self-consciousness*). The third subscale assesses *social anxiety*. The SCS items were rewritten to refer to the experimental situation rather than to how subjects generally felt. For example, "I get embarrassed very easily" was changed to "I got embarrassed very easily." One item on the public self-consciousness scale ("One of the last things I do before I leave my house is look in the mirror") could not be easily rewritten and was omitted. Following Buss's (1980) suggestion that transient states of self-consciousness be labeled "self-awareness," the subscales of the revised state version of the SCS will be referred to as the public and private self-awareness subscales.

#### *State Anxiety*

All subjects completed an 8-item assessment of their anxiety during the interaction. The endpoints of 5-point Likert scales were labeled with antonyms such as relaxed-tense, calm-nervous, etc. The eight anxiety items were randomly interspersed with twelve filler items.

### **Results**

All dependent measures were analyzed in 2 (high versus low social anxiety)  $\times$  2 (evaluative versus nonevaluative condition) analyses of variance (ANOVAS).

### Manipulation Check

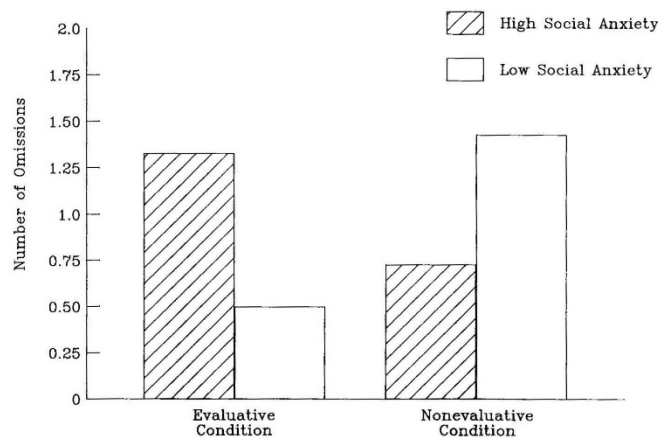
High SADS scorers ( $M = 2.77$ ,  $SD = 0.95$ ) achieved higher state anxiety scores during the interaction than low SADS scorers ( $M = 2.15$ ,  $SD = 0.61$ ),  $F(1, 56) = 7.77$ ,  $p < .05$ . Subjects who were the focus of evaluation ( $M = 2.63$ ,  $SD = 0.88$ ) tended to report more anxiety during the interaction than subjects who were not the focus of evaluation ( $M = 2.28$ ,  $SD = 0.79$ ),  $F(1, 56) = 3.92$ ,  $p < .053$ . The interaction effect did not approach significance.

The pattern of subjects' scores on the revised SCS social anxiety subscale mirrored those of the state anxiety measure. There was a significant main effect for anxiety classification (High anxiety  $M = 13.40$ ,  $SD = 5.89$ ; Low anxiety  $M = 7.07$ ,  $SD = 5.20$ ),  $F(1, 56) = 20.50$ ,  $p < .001$ , and a nearly significant main effect for evaluation (Evaluative  $M = 11.32$ ,  $SD = 6.07$ ; Nonevaluative  $M = 9.07$ ,  $SD = 6.58$ ),  $F(1, 56) = 3.03$ ,  $p < .087$ . The interaction effect was not significant ( $p > .10$ ).

### Recall

Three measures were derived from the recall test—total number of items correctly recalled (total recall), number of items recalled incorrectly (recall errors), and number of items omitted. Anxious subjects recalled less information ( $M = 10.03$ ,  $SD = 2.71$ ),  $F(1, 56) = 4.13$ ,  $p < .05$ , and made more errors ( $M = 5.93$ ,  $SD = 2.38$ ),  $F(1, 56) = 5.29$ ,  $p < .05$ , than nonanxious subjects (Total recall  $M = 11.30$ ,  $SD = 2.28$ ; Recall errors  $M = 4.77$ ,  $SD = 1.61$ ). The main effect for evaluation was not significant for total recall or recall errors ( $ps > .10$ ). The interaction effect for total recall approached significance ( $p < .09$ ). This interaction trend was due to anxious subjects' recall deficits in the evaluative condition.

The interaction effect of subject anxiety and evaluation was significant for the number of omitted items,  $F(1, 56) = 9.47$ ,  $p < .003$  (see Figure 1). Duncan's Multiple Range Tests revealed that anxious/evaluative ( $M = 1.33$ ,  $SD = 0.82$ ) and nonanxious/nonevaluative ( $M = 1.43$ ,  $SD = 1.28$ ) subjects both omitted more information than anxious/nonevaluative ( $M = 0.73$ ,  $SD = 0.88$ ) and nonanxious/evaluative ( $M = 0.50$ ,  $SD = 0.82$ ) subjects who did not differ from one another. Neither main effect was significant for omissions.



**Figure 1.** Mean number of items omitted on the recall task for socially anxious and non-anxious subjects under evaluative and nonevaluative conditions.

**Self-Awareness**

Anxious subjects reported more private self-awareness ( $M = 11.20$ ,  $SD = 2.76$ ),  $F(1, 56) = 5.25$ ,  $p < .03$ , and tended to report more public self-awareness ( $M = 15.50$ ,  $SD = 4.94$ ),  $F(1, 56) = 3.45$ ,  $p < .068$ , than nonanxious subjects (Private  $M = 9.40$ ,  $SD = 3.28$ ; Public  $M = 12.93$ ,  $SD = 5.78$ ). The main effect for evaluation and the interaction effect were not significant for either private or public self-awareness.

Correlations between public and private self-awareness and total recall, recall errors, and omissions were computed separately for high and low anxious subjects. As shown in Table 2, public and private self-awareness were positively correlated with total recall and negatively related to recall errors and omissions for low anxious subjects, suggesting that higher levels of self-awareness facilitated recall. Most correlations were nonsignificant for high anxious subjects. However, higher public self-awareness was related to a higher frequency of omissions for anxious subjects.

**Table 2.** Correlations among Public and Private Self-Awareness and Recall Measures for High and Low Socially Anxious Subjects

	Private Self-Awareness	Public Self-Awareness
High Socially Anxious Subjects ( $n = 30$ )		
Total Recall	.14	-.05
Recall Errors	-.12	-.08
Omissions	-.10	.32*
Low Socially Anxious Subjects ( $n = 30$ )		
Total Recall	.47**	.44**
Recall Errors	-.39*	-.33*
Omissions	-.39*	-.40*

\* $p < .05$ , \*\* $p < .01$

**Discussion**

It was hypothesized that socially anxious subjects would demonstrate more recall deficits than nonanxious subjects following a heterosocial interaction. This hypothesis was largely supported. Anxious subjects recalled less information and made more recall errors than nonanxious subjects. However, when recall was defined in terms of the number of items omitted, the hypothesis was not supported. Anxious subjects in the evaluative condition and nonanxious subjects in the nonevaluative condition both omitted more information than anxious/nonevaluative and nonanxious/evaluative subjects. It was predicted that the anxious/evaluative group would have high omission scores, but the poor performance of nonanxious/nonevaluative subjects was unexpected. Examination of the data for nonanxious/nonevaluative subjects indicates that their total recall was similar to that of nonanxious/evaluative subjects. However, if they did not know the answer, they left the item blank rather than making errors. Perhaps absence of both high-trait social anxiety and high social-evaluative threat made these subjects more willing to admit when they could not recall certain items.



It was also expected that the anxious subjects' recall deficits would be most pronounced under conditions of high social-evaluative threat. Although there was a trend in that direction for total recall, the other two analyses (recall errors and omissions) did not support this hypothesis. Failure to find the expected interaction between social anxiety and evaluative threat' may be attributable to the level of anxiety subjects experienced. As noted, the effects of the evaluation manipulation on state anxiety just missed conventional levels of significance ( $p < .053$ ). An inspection of the means for state anxiety reveals that, even in the nonevaluative condition, socially anxious subjects reported more anxiety ( $M = 2.47$ ) than nonanxious subjects in either condition (Evaluative  $M = 2.22$ ; Nonevaluative  $M = 2.07$ ). Apparently just participating in a heterosocial interaction, even one in which they were not the focus of attention, induced anxiety for anxious subjects. Nonanxious subjects were relatively comfortable whether or not they were to be evaluated. Interestingly, Johnson and Glass (1989) also failed to find effects on a variety of cognitive and behavioral measures with a similar manipulation of social evaluative threat.

As expected, high anxious subjects reported more private self-awareness and tended to report more public self-awareness than nonanxious subjects. When the relationship between self-awareness and recall was examined separately for high and low anxious subjects, two distinct patterns emerged. For nonanxious subjects, greater public and private self-awareness was associated with better recall. For anxious subjects only one correlation was significant, but it showed the opposite relationship—high public self-awareness was associated with more omissions. Thus self-awareness appears to serve a facilitative function for nonanxious subjects but a disruptive function for anxious subjects. This is only partially supportive of the second hypothesis that recall deficits would be associated with excessive self-focused attention. However, given the number of studies linking social anxiety and attentional focus, the nature of the relationship between social anxiety, self-awareness, and recall merits further investigation.

The social information-processing deficits that were associated with high social anxiety in this study are important because of their potential to disrupt social interactions. If an individual cannot recall specific information about an interaction partner, he or she risks making inappropriate comments and/or may miss opportunities to further the conversation by not responding to previously communicated information. Such disruption in the interaction would likely increase the individual's anxiety which may, in turn, produce more disruption and more anxiety.

There is some evidence to suggest that recall deficits like those found in the present study are associated with disrupted social performance and anxiety. For example, socially anxious subjects elaborate less on current and past conversation topics (Johnson & Glass, 1989) and speak less during social interactions (Conger & Farrell, 1981).

Furthermore, we have noted that social phobics in our treatment program (Heimberg, Becker, Goldfinger, & Vermilyea, 1985; Heimberg, Dodge, Hope, Kennedy, Zollo, & Becker, 1990) often indicate that they do not know what to say during anxiety-provoking interactions. It may be that they do not recognize available conversation topics because of excessive self-focus.

Taken together, these findings support cognitive models of social anxiety (Hartman, 1983; Leary, 1983) which hypothesize that the behavioral deficiencies associated with high

social anxiety may be a byproduct of inadequate processing of social information rather than lack of skill. For example, anxious individuals may fail to ask appropriate questions which elaborate on a previous topic because they do not remember the topic. This is very different from a skills deficit model which attributes failure to ask questions to inadequate questioning skills or lack of knowledge that asking a question would facilitate the conversation. From the information-processing perspective, increasing questioning skills would be an ineffective treatment strategy unless the individual also learned to focus more attention on the conversation and on the interaction partner.

Obviously, this does not rule out the possibility that some socially anxious individuals have skill deficits. However, it does imply that careful assessment of both social skills and social information-processing strategies is needed before selecting a treatment intervention.

This study demonstrated that socially anxious subjects process social information differently from nonanxious subjects during moderately structured social interaction. However, the study does not indicate whether the recall deficits found in the anxious subjects were specific to social information in interactions or represented more general deficits. From our work with social phobics, we hypothesize that the recall deficits occur only in social situations which provoke anxiety, but that in those situations, all aspects of information processing (including non-social information) is disrupted. Finally, the present study utilized only women as subjects. Although we have no reason to believe these findings would not generalize to men, this issue needs empirical examination.

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