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SOCIAL ANXIETY AND SELECTIVE MEMORY FOR AFFECTIVE INFORMATION ABOUT THE SELF*

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High and low socially anxious women were given identical feedback about their personality traits after a brief social interaction with a male confederate. The male confederate was trained to respond positively (success) to half of the subjects in each group during the interaction and negatively (failure) to the other half. Results of a subsequent recognition memory test for the feedback supported one of the main hypotheses and indicated that high socially anxious subjects had more accurate memory for negative information about themselves than did low socially anxious subjects. Success and failure experiences had no effects on memory. The possible contribution of such selective memory to the mediation and maintenance of social anxiety is discussed.

While social anxiety is a frequently encountered clinical problem (Bryant and Trower, 1974; Zimbardo *et al.*, 1975), the factors contributing to its etiology and maintenance have not been adequately studied. Recently, a number of behavior modification studies have appeared concerning the treatment of social anxiety in dating situations (*e.g.*, MacDonald *et al.*, 1975; McGovern *et al.*, 1975; Twentyman and McFall, 1975). These studies have adopted a behavioral model which assumes that social anxiety is mediated by a social skill deficit. In this model the anxiety of the socially anxious individual is viewed as a realistic reaction to his inadequate social skills which have led to aversive outcomes in his social interactions.

There are only a few studies which provide data directly relating to the social skill deficit model. These studies have compared high and low socially anxious subjects on a number of behavioral measures of social skill derived from role played or real laboratory interactions (Arkowitz *et al.*, 1975; Borkovec *et al.*, 1974; Glasgow and Arkowitz, 1975; Twentyman and McFall, 1975). With the exception of the Twentyman and McFall study, these studies have found few behavioral social skill differences between high and low anxious subjects, casting doubt on the social skill deficit model.

Other models of social anxiety have emphasized cognitive factors as mediators of social anxiety. In these models, social anxiety is viewed as a function of the

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way in which individuals process information about themselves and their social performance. The views of Bandura (1969) and Kanfer (1971) have emphasized processes involving self-evaluation, excessively high standards for performance, and inadequate self-reinforcement patterns. In these views, negative self-evaluations may occur independent of actual social skill competencies if individuals have excessively high performance standards, or if they selectively process negative information about themselves. Consistent with the self-evaluation model, two recent studies (Clark and Arkowitz, 1975; Glasgow and Arkowitz, 1975) have provided evidence that socially anxious men evaluate their social performance more negatively than do observers of their performance. By contrast, the self-evaluations of low socially anxious men were more consistent with those of observers of their performance. These findings point to the role of overly negative self-evaluations as a factor in mediating social anxiety, apart from level of social skill.

One way in which overly negative self-evaluations may arise is if individuals selectively remember negative vs. positive information about themselves and their performance. The present study investigates selective memory for positive vs. negative affective information about the self as a function of social anxiety. While there have not been any studies of selective attention and memory in socially anxious persons, these processes have been studied in a related context. Mischel and his associates (Mischel *et al.*, 1973, 1976) have studied selective attention and memory for affective information about oneself as a function of success or failure in a concept learning task. These studies have demonstrated that subjects who were successful in the task attended to and remembered more of their personality assets (positive information) than did subjects who experienced failure.

In the present study, high and low anxious women interacted with a male confederate who was trained to respond positively (success) to half of the subjects in each group and negatively (failure) to the other half of the subjects. Following this interaction, subjects were given identical feedback, supposedly consisting of the confederates' impressions of them. This feedback consisted of a set of positive and negative adjectives describing personality traits and was identical for all subjects. A recognition memory test for the feedback words constituted the main dependent variable. It was predicted that high socially anxious subjects would have more accurate memory for negative information and less accurate memory for positive information about themselves than would low socially anxious subjects. In addition, the success-failure manipulation permitted a replication of the Mischel *et al.* (1976) findings with a different population and a different type of task. Consistent with these findings, it was predicted that those subjects who experienced a success would remember more positive information about themselves compared with subjects who experienced failure. The present study also examined the interaction between the dispositional factor of social anxiety and the situational factor of success-failure for effects on selective memory.

METHOD

SUBJECTS

High socially anxious and low socially anxious females were selected for the study on the basis of their scores on Watson and Friend's (1969) Social Avoidance and Distress Scale. The Social Avoidance and Distress Scale is a 28-item, true-false questionnaire which has received validational support in studies by Watson and Friend (1969) and Arkowitz *et al.* (1975). This questionnaire was administered to 560 single undergraduate women at the University of Oregon. Two subject groups were formed by selecting from the high and low ends of the distribution. The mean of the high socially anxious group was 16.03 (range 12-28) and the mean of the low socially anxious group was 0.94 (range 0-3). The mean age of the subjects in the study was 19.3 years. Subjects were paid two dollars for their participation.

EXPERIMENTERS AND CONFEDERATES

One male and one female served as experimenters and two males served as confederates for the interactions. Subjects were led to believe that the confederates were naive subjects. 'In fact, the confederates were trained to role-play either positive or negative behavior during the interaction. In the success condition, the confederates were instructed to initiate conversation, show interest in what the subject had to say, smile frequently, and maintain eye contact. In the failure condition, they were instructed to initiate no conversation after the first few minutes of the interaction, respond briefly to questions from the subject, smile infrequently, and act bored and uninterested in the subject. Details of the training procedure are available in O'Banion (1974). Subjects were randomly assigned to either the success or failure condition. The experimenters and confederates were blind to the hypotheses of the study and to the subjects' social anxiety classification.

PROCEDURE

The initial phase of the experiment consisted of a 7-minute interaction between the subject and the confederate. A few minutes after the subject was seated, the experimenter brought the confederate into the room. The subject and the confederate were told that the study concerned the process of acquaintanceship, and that their task would be to get to know each other in the next few minutes as they normally would if meeting for the first time socially. The experimenter indicated that their conversation would be tape-recorded, and left the room.

After seven minutes, the experimenter re-entered the room and announced that he wanted to obtain feedback about the interaction from each of them separately. The confederate was taken to another room while the subject was asked to remain in the experimental room. The experimenter returned several minutes later and asked the subject to fill out three 7-point self-rating scales of social skill, social anxiety, and favorability of partner response to her during the interaction. This last rating served as one check on the confederates' behavior. As a further check on the confederates, similar ratings of their behavior were also made by an observer blind to the nature and purpose of the experiment. Immediately after the interaction, the confederates also rated the subjects on social skill and social anxiety using scales identical to those of the subjects.

Subjects then filled out a feedback form which asked for their first impressions of the confederate. Subjects were informed that the confederate was filling out similar forms and that she would be getting feedback about his first impressions of her.

The feedback form which the subject filled out about the confederate consisted of 80 adjectives, listed in random order on one page. with a space by each for the subject to check if she felt that word applied to her partner. The only reason for asking the subjects to fill out this form was to enhance the credibility of the deception. After the subject completed this form, the experimenter collected it, and led the subject to believe that he then took it to the confederate. After a few minutes, the experimenter returned with what was presumably the confederate's feedback to the subject. This feedback was *identical* for all subjects and consisted of an 80-page booklet, with one adjective per page, along with a space next to each adjective for a check mark. No adjective which appeared in this booklet appeared on the list which the subjects filled out for their partners. Subjects were asked to look through this booklet and to examine each page for two to three seconds. This procedure was adopted in order to control for exposure and attention time to each adjective.

Twenty-eight of the 80 adjectives which the subject saw in the feedback booklet had a check mark next to them, presumably indicating that the confederate felt that those adjectives applied to the subject. Half were positive and half were negative trait adjectives. Positivity and negativity were determined by social desirability ratings of these words derived from the work of Goldberg (Notes 1 and 2) and Norman (Note 3).

RECOGNITION MEMORY AND *d'*

After a wait of two minutes, the experimenter announced to the subject that she would be tested for her memory of the adjectives which had been checked in the feedback booklet. Subjects were presented with a series of index cards, each with one adjective from the feedback booklet typed on it. These adjectives appeared in a random, but identical, order for each subject and were shown briefly, one at a time, to the subjects by the experimenter. After reading each adjective, subjects said aloud either "Yes" or "No", indicating whether or not they believed that adjective had been checked in the feedback booklet. In addition, they rated how confident they were of each answer on a 4-point scale to provide information which could be used to compute strength of memory for the material. These confidence ratings allowed for computation of memory scores using the *d'* statistic commonly used in signal detection research (Green and Swets, 1966), and more recently applied to recognition memory (Banks, 1970; Mischel *et al.*, 1976). In simple terms, *d'* is a measure of a subject's ability to discriminate words which were checked from those which were not. To compute *d',* subjects' responses to the checked feedback adjectives were compared with their responses to 24 control adjectives (It positive, 13 negative) which were matched in evaluative meaning to the checked feedback words, but ~ere of opposite semantic meaning. For example, if *generous* was a feedback word, *thrifty,* which is also a positive trait word, would be its control word. With perfect memory, subjects would respond "Yes-3" to all feedback adjectives, and "No-3" to all control adjectives. Since *d'* represents the difference between the means of the distributions of responses to the feedback and control adjectives, a larger *d'* indicates better memory. The *d'* measure is preferred over the more traditional measure of number of errors because it corrects for the response bias produced by acquiescence. The use of control words matched on evaluative meaning also eliminates a possible bias introduced by a subject's tendency to endorse positive or negative traits differentially on the memory test. Separate *d'* scores were calculated for positive and negative feedback adjectives for each subject.

DEBRIEFING

After the recognition memory test, the subjects were fully debriefed according to a standard format. The experimenter first asked the subject several open-ended questions aimed at discovering if the subject had previous information about the study or suspicions about the confederate and the programmed roles. Any subject who mentioned suspicions about the confederate at this stage was replaced by the next available subject. Three high anxious subjects and one low anxious subject, all in failure conditions, were replaced due to suspiciousness. The experimenter then explained the study fully and allowed the subject to talk with the confederate informally in order to reduce any anxieties that might have been generated by the manipulations.

RESULTS

CHECKS ON THE MANIPULATION

As a check on the effectiveness of the programmed positive and negative roles played by the confederates, 2 x 2 analyses of variance (Social Anxiety Classification x Success-Failure) were performed on the subjects' and observer's ratings of the confederates' behavior. Both the subjects ($F = 143.10$, $df = 1,60$, $p < 0.001$) and the observer ($F = 324.93$, $df = 1,19$, $p < 0.001$) rated the confederates as significantly more positive when playing the positive role than when playing the negative role. Thus, the confederates' behavior clearly differed in the success and failure conditions.

To ensure that scores on the Social Avoidance and Distress Scale did not differ for success and failure groups, a 2 x 2 (Social Anxiety Classification x Success-Failure) analysis of variance was performed on these scores. No significant differences were found between the success and failure groups ($F = 0.003$, $df = 1,60$, n.s.)

One-tailed tests of significance were employed for those memory measures for which specific directional predictions had been made. Otherwise, tests of significance were two-tailed. Results were analyzed with 2 x 2 x 2 repeated measures analyses of variance (Social Anxiety Classification x Success-Failure x Positive-Negative Adjectives) for both number of errors and *d'.* Number of errors included both those instances in which subjects failed to recognize a feedback word and those instances in which subjects incorrectly identified a control word as a feedback word. The only significant finding to emerge from these analyses was a main effect for *d'* for memory for positive vs. negative adjectives indicating that, overall, subjects remembered negative adjectives better than positive adjectives ($F = 9.20$, $df = 1,60$, $p < 0.01$), regardless of success-failure conditions and social anxiety classification. Contrary to the predictions, there were no effects on memory for either the success-failure manipulation or social anxiety classification. The means and standard deviations of the high and low socially anxious groups are presented in Table 1 for number of errors and *d'* on positive and negative adjectives. Since the pattern of means suggested a trend

TABLE 1: MEANS AND STANDARD DEVIATIONS FOR MEMORY MEASURES

		Positive Feedback Adjectives		*Negative Feedback Adjectives*	
Measure	*Group*	*M*	*SD*	*M*	*SD*
Number of Errors	High Anxious	5.28	3.20	4.68	2.64
	Low Anxious	5.62	2.07	5.78	2.43
d'	High Anxious	1.57	0.72	1.82	0.55
	Low Anxious	1.47	0.48	1.59	0.47

supporting the hypothesis that high anxious subjects had better memory for negative adjectives than did low anxious subjects, further analyses were conducted. Two-way analyses of variance (Social Anxiety Classification x Success Failure) as well as *t*-tests for both positive and negative adjectives were performed. A summary of these analyses is presented in Table 2. The analysis of variance for negative adjectives revealed a significant main effect for social anxiety classification, with high socially anxious subjects having more accurate memory for negative adjectives than low socially anxious subjects for both number of errors ($F = 2.92$, $df = 1,60$, $p < 0.05$, one-tailed) and for *d'* ($F = 3.19$, $df = 1,60$, $p < 0.05$, one-tailed). There were no significant differences

TABLE 2: ANALY S OF VARIANCE FOR NUMBER OF ERRORS AND FOR NEGATIVE ADJECTIVES

		Number of Errors			
Source	*df*	*MS*	*F*	*MS*	*F*
Social Anxiety Classification (A)	1	19.14	2.92*	0.85	3.19*
Success or Failure (B)	1	0.02	0	0	0
AB	1	6.89	1.05	0	0.01
S/AB	60	6.56		0.27	

*$p < 0.05$.

between social anxiety groups for memory of positive adjectives. One-tailed t-tests yielded similar results. High socially anxious subjects remembered negative adjectives more accurately than did low socially anxious subjects for both number of errors ($t = 1.72$, $df = 62$, $p < 0.05$, one-tailed) and for *d'* ($t = 1.81$. $df = 62$, $p < 0.05$, one-tailed). Once again, no differences emerged between social anxiety groups for memory of positive adjectives.

Self and Confederate Ratings

Social skill and social anxiety ratings of the subjects made by both the subjects themselves and the confederates were analyzed by two-way analyses of variance (Social Anxiety Classification x Success-Failure). The results indicated that the high anxious subjects rated themselves as less socially skilled ($F = 18.97$, $df = 1,60$, $p < 0.01$) and more anxious ($F = 8.34$, $df = 1,60$, $p < 0.01$) than did the low anxious subjects. The confederates also rated the high anxious subjects as less skillful ($F = 27.52$, $df = 1,60$, $p < 0.001$) and more anxious ($F = 25.45$, $df = 1,60$, $p < 0.001$) than they rated the low anxious subjects.

Subjects in success conditions rated themselves as more skillful than those in failure conditions ($F = 16.74$, $df = 1,60$, $p < 0.001$) but did not rate themselves as significantly different on anxiety. Confederate ratings of skill and anxiety did not differ between success and failure subjects.

DISCUSSION

The results of this study provide support for the hypothesis that high socially anxious women selectively remember negative information about themselves better than low socially anxious women. The two groups did not differ in their memory for positive information.

Selective memory for information about oneself may be an important factor in the mediation and maintenance of social anxiety. Processing information about oneself in such a way as to selectively remember negative information is likely to be associated with negative self-evaluations (*e.g.*, Clark and Arkowitz, 1975) and with low levels of self-reinforcement for social behaviors (*e.g.*, Kanfer, 1971). Such processing could serve to maintain social anxiety and avoidance even in individuals who had adequate levels of social skill. However, self and observer ratings of social skill did show that the high anxious women were also more deficient in social skill than the low anxious women. Thus, for women, the results of the present study point to cognitive factors as well as social skill deficits in the mediation of social anxiety.

While the hypothesis concerning selective memory for negative information was confirmed, the hypotheses relating to selective memory as a function of success and failure were not supported. The success-failure manipulation was clearly effective, but there were no memory differences between subjects who experienced these conditions nor any interaction of success-failure with social anxiety. This lack of difference on selective memory as a function of success vs. failure conditions fails to replicate the Mischel *et al.* (1976) findings. However, there were differences in the nature of the tasks used in the two experiments. Mischel *et al.* (1976) used cognitive problem-solving tasks as opposed to the social interaction task in the present experiment.

Another explanation for the lack of memory differences due to success and failure experiences is that individuals' expectancies of how they usually perform at a given task can outweigh their immediate experience (Mischel, 1973). Unlike the relatively unique cognitive tasks frequently used in success-failure studies, the social interaction task employed in this study is a fairly common occurrence. It seems reasonable that most people have formed fairly stable expectancies about their social interactions and outcomes. Consistent with this explanation, Mischel *et al.* (1976) found that when subjects were given expectancies about how they would perform on a future task, these expectancies outweighed the effects of their prior laboratory experience. In the present study it may be that subjects' expectancies about their typical social interactions,

based on past experiences, were more powerful than the single experimental manipulation. If so, one would not expect to obtain memory differences on the basis of this manipulation.

Since the experimental procedure controlled for equal attention time to each adjective, it is unlikely that the present results were mediated by selective attention, although this factor may operate in the natural environment. The memory differences that were found between social anxiety groups might have been more marked if attentional differences to the positive and negative adjectives had not been controlled and if the procedure had allowed subjects more time to selectively rehearse the information. Future research should examine the effects of both selective attention and longer rehearsal time on selective memory in socially anxious subjects. In addition, the determinants of social anxiety may differ for women and men. Further research in this area should examine such possible sex differences.

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REFERENCES

Arkowitz, H.; Lichtenstein, E.; McGovern, K.; Hines, P., 1975: The behavioral assessment of social competence in males. *Behavior Therapy. 6:* 3-13.

Bandura, A., 1969: *Principles 01 Behavior Modification.* Holt Rinehart and Winston, New York.

Banks, W. P., 1970: Signal detection theory and human memory. *Psychological Bulletin, 74:* 81-99.

Borkovec, T. D.. Stone, N. M.; O'Brien, G. T.; Kaloupek, D. G., 1974: Evaluation of a clinically relevant target behavior for analogue outcome research. *Behavior Therapy, 5:* 503-11.

Bryant, B. M.; Trower, P. E., 1974: Social difficulty in a student sample. *British Journal of Educational Psychology, 44:* 13-21.

Clark, J. V.; Arkowitz. H., 1975: Social anxiety and self-evaluation of inter~ personal performance. *Psychological Reports, 36:* 211-21.

Glasgow, R.; Arkowitz, H., 1975: The behavioral assessment of male and female social competence in dyadic heterosexual interactions. *Behavior Therapy, 6:* 488-98.

Green, D. M.; Swets, J. A., 1966: *Signal Detection Theory and Psychophysics.* Wiley, New York.

Kanfer, F. H., 1971: The maintenance of behavior by self-generated stimuli and reinforcement. In A. Jacobs and L. B. Sachs [Eds.], *The Psychology of Private Events,* pp. 41-59. Academic Press, New York.

MacDonald, M. L.; Lindquist, C. U.; Kramer, J. A.; McGrath, R. A.; Rhyne, L. L., 1975: Social skills training: Behavior rehearsal in groups and dating skills. *Journal of Counseling Psychology, 22:* 224-31.

McGovern, K. B.; Arkowitz, H.; Gilmore, S. K., 1975: The evaluation of social skill training programs for college dating inhibitions. *Journal of Counseling Psychology, 22:* 505-12.

Mischel, W., 1973: Toward a cognitive social learning reconceptualization of personality. *Psychological Review, 80:* 252-83.

Mischel, W.; Ebbesen, E.; Zeiss, A., 1973: Selective attention to the self: Situational and dispositional determinants. *Journal of Personality and Social Psychology, 27:* 12942.

_____ 1976: Determinants of selective memory about the self. *Journal of Consulting and Clinical Psychology, 44:* 92-103.

O'Banion, K. L., 1974: Social anxiety and selective memory for affective information about the self. Unpublished master's thesis, University of Oregon.

Twentyman, C.; McFall, R. M., 1975: Behavioral training of social skills in shy males. *Journal of Consulting and Clinical Psychology, 43:* 384-95.
Watson, D.; Friend, R., 1969: Measurement of social-evaluative anxiety. *Journal of Consulting and Clinical Psychology, 33:* 448-51.
Zimbardo, P.; Pilkonis, P.; Norwood, R., 1975: The social disease called shyness. *Psychology Today, 8:* 69-72.

REFERENCE NOTES:

(1) Goldberg, L. R., 1972: Some normative characteristics of the 1710 trait descriptive adjectives. Unpublished manuscript, Oregon Research Institute, Eugene, Oregon.
(2) Goldberg, L. R., 1973: The -exploitation of the English language for the development of a descriptive personality taxonomy. Paper presented at the American Psychological Association, Montreal, Canada.
(3) Norman, W. T., 1967: *2800 Personality Trait Descriptors: Normative Operating Characteristics for a University Population.* Office of Research Administration No. 08310-l-T, University of Michigan.

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