THE ROLE OF MODEL AFFECT

IN TEST ANXIETY

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CHAPTER I

INTRODUCTION

Although anxiety has long been regarded as a fundamental human emotion, the term did not gain currency in the psychological literature until the 1930's. Since then, clinical and empirical interest in anxiety has increased dramatically. In spite of this tremendous interest and productivity, a comprehensive and widely held theory has failed to emerge. The lack of consensual agreement regarding the nature of anxiety is primarily a result of the conceptual ambiguity of of the term and the lack of clear operational referents (Phillips, Martin, & Meyers, 1972).

A number of researchers in recent years have focused attention on specific sources of anxiety, such as social anxiety, anxiety over public speaking, and test anxiety. This trend towards specialization is due partly because these sources are of intrinsic interest themselves, and also because of the nebulous character of the concept of general anxiety.

Test anxiety is a pervasive problem on the college campus. While anxiety in test situations may actually facilitate the performance of some students, more often it is disruptive and leads to performance decrements. Indeed, many students are so disturbed by test anxiety that they seek assistance to cope with its debilitating effects. It has been repeatedly demonstrated that persons who are high in test anxiety are

particularly vulnerable to evaluative situations (Wine, 1971). Test anxious individuals perceive such situations as personally threatening, and tend to exhibit task-irrelevant, self-centered worry responses that interfere with the effective performance of cognitive-intellectual tasks.

Research conducted within the framework of social-learning theory (Bandura, 1969) demonstrates that virtually all learning phenomena resulting from direct experience can occur on a vicarious basis through observations of other persons' behaviors and their consequences. Accordingly, an individual can acquire complex response patterns by observing the performances of appropriate models. Perhaps more relevant to the study of anxiety is evidence suggesting that emotional responses can be activated and conditioned observationally by witnessing the affective reactions of others.

The present study is concerned with the relationship between the affective state of a model and the subsequent performance of an observer. More specifically, the current investigation seeks to clarify the consequences of prior observation of an anxious model on the anxiety and performance level of high and low test anxious observers.

CHAPTER II

LITERATURE REVIEW AND STATEMENT OF THE PROBLEM

Sarason (1972a) has noted that the test anxious individual is particularly influenced by pre-performance informational cues. Indeed, initial research involving test anxiety was primarily concerned with the impact of achievement-oriented instructions upon high and low anxious subjects. In general, high test anxious subjects are adversely affected by conditions that emphasize the evaluative nature of task performance (Wine, 1971).

More recent investigations, however, have examined the effect of a model upon the subsequent performance of individuals differing in test anxiety. Sarason, Pederson, and Nyman (1968) permitted subjects to observe a model perform on a serial learning task prior to their own performance. It was found that the performance of high test anxious subjects increased more than low test anxious individuals following exposure to a model. Sarason et al. (1968) suggested that the opportunity to observe a model performing in a composed, orderly manner may provide the subject with tactics that would be useful in performance situations.

Several other studies provide more direct evidence that a highly anxious subject tends to utilize cues furnished by a model. Research on cognitive modeling has shown that persons high in anxiety are particularly responsive to demonstrations of problem-solving strategies

Sarason, 1973a). Similarly, Sarason (1975a) observed that high anxious individuals exhibited superior performance compared to low anxious subjects after witnessing a model disclose anxiety-coping strategies. Although test anxiety was not the central focus of the study, Bauer (1978) reported that anxious individuals were more likely than non-anxious subjects to imitate the behavior of a model in a maze learning task. In summary, the data seem to suggest that high test anxious persons are not only attentive to social cues but also tend to imitate the behavior and cognitive strategies of models.

A specific informational cue that is of central concern to the present study is the emotional state exhibited by the model. It is well documented that the affective expression of a model will produce vicarious emotional arousal in an observer (Bandura, 1969; Berger, 1962). Recent investigations within the test anxiety literature have demonstrated the potency of affective modeling cues in the transmission of evaluation anxiety (Morris, Brown, & Halbert, 1977). Preschool children exposed to an anxious model reported a higher incidence of nervousness and concern regarding performance compared to subjects who viewed a non-anxious model.

In addition, Stotland (1969) has obtained evidence that the emotional responsiveness of the observer is enhanced under conditions of high model-observer similarity. A plausible assumption derived from this data is that anxiety manifested in a model is more likely to provoke similar emotional responses in a high test anxious observer compared to a low test anxious subject. That is, the highly anxious individual is more likely to imitate the affective displays of an anxious model. This hypothesis seems consistent with evidence

suggesting that highly aroused subjects tend to model an emotional state more so than less aroused individuals (Schacter & Singer, 1962; Schacter & Wheeler, 1962).

The effect of an anxious model on the subsequent performance of high and low test anxious subjects has received little empirical attention. Sarason (1973b) examined the performance of high and low test anxious subjects following interaction with experimenters differing in test anxiety. The results indicated that when the experimenters attempted to relax the subjects prior to performance, the high anxiety subjects performed better in the presence of low test anxious experimenters compared to high test anxious experimenters. However, the affective cues of the experimenters were not experimentally controlled, and thus conclusions regarding the influence of the emotional state of a model must be regarded as tentative.

Jaffe and Carlson (1972) assessed the effectiveness of modeling therapy as a treatment for test anxiety and investigated the role of model affect and performance feedback in determining that effectiveness. Test anxious individuals were exposed to one of four modeling displays of test behavior (calm model-positive consequences, calm model-negative consequences, anxious model-positive consequences, anxious model-negative consequences). A control group of subjects was included who participated in the performance sessions but were not exposed to the models. The results indicated a significant improvement in performance for the experimental groups relative to the control group. However, no significant differences were found between model types.

Interestingly, these findings are markedly discrepant from results obtained in previous test anxiety studies. Jaffe and Carlson (1973)

observed that, following exposure to models that received negative feedback regarding performance, high test anxious persons demonstrated improvement on intelligence tests. In contrast, Sarason (1972b) has reported that observation of failure has a debilitating effect on highly anxious subjects.

The lack of previous research involving the consequences of model affect preclude direct comparisons with the data of Jaffe and Carlson (1972). However, several studies (Sarason, 1973b, 1975a) suggest that prior interaction with both high test anxiety individuals and models who verbalize test anxiety concerns disrupts the performance of high test anxiety observers.

Furthermore, the methodology of the study raises doubts as to the generality of the findings. The subjects were informed that the experiment was designed to investigate novel methods of reducing test anxiety and improving test performance. This information may have created strong expectations of beneficial outcomes. Thus, it is possible that demand characteristics may have obscured any differences in treatment conditions and merely enhanced the performance of all subjects exposed to treatment. In addition, the results are limited since the study did not allow for comparisons with a low test anxiety group.

The present study seeks to clarify the relationship between the affective cues of a model and the subsequent performance of an observer. In order to avoid the possible demand characteristics implicit in the study of treatment efficacy, the present investigation required subjects to perform a task that purportedly was related to intellectual abilities. Furthermore, to provide a more clear and rigorous test of the effects of

model affect on test anxiety, both high and low test anxious individuals participated in the study.

High and low test anxious subjects, as defined on the Text Anxiety Scale (Sarason, 1972a), were required to perform a spatial visualization task following exposure to either an anxious model, non-anxious model, or no model at all.

It was hypothesized that:

1. High test anxious subjects would obtain lower spatial visualization scores than low test anxious subjects. Studies have demonstrated that high test anxious individuals are adversely affected by evaluative conditions (Sarason, 1972a).

2. High test anxious subjects would obtain lower scores on the spatial visualization task following exposure to a highly anxious model than high test anxious subjects presented with a non-anxious model. Sarason (1973b, 1975a) has obtained evidence that highly anxious experimenters and models who disclose test anxiety concerns have a detrimental effect on high test anxious subjects.

3. High test anxious subjects will evaluate their performance more negatively than low test anxious subjects. Holroyd, Westbrook, Wolf, and Badhorn (1978) have demonstrated that the performance evaluations of high test anxious women are biased in a negative manner.

4. Prior to performance, high test anxious subjects will experience higher levels of anxiety following observation of an anxious model compared to high test anxious subjects who viewed a non-anxious model. It is well documented that the emotional display of a model can serve to heighten the affective state of an observer (Bandura, 1969).

CHAPTER III

METHOD

Subjects

Sixty female undergraduate students enrolled in courses at Oklahoma State University received extra credit for participation in the study. All subjects were administered the 37 item version of the Test Anxiety Scale (Sarason, 1972a). Thirty subjects with scores above the median were assigned to the high anxiety group (range = 15-31, $\underline{M}$ = 20.73). The low test anxiety group was composed of thirty subjects who obtained scores below the median (range = 1-14, $\underline{M}$ = 8.67). The median score for the total sample was 14.5.

Materials

The Text Anxiety Scale (TAS) was employed in this study. This scale is designed to assess subjective emotional reactions experienced in test situations. The instrument contains 37 items presented in a true-false format. Summation of items that are marked in the indicated direction provide a total score. Sarason (1959, 1961) reports correlations ranging from .41-.46 for males and .49-.53 for females between the Taylor Manifest Anxiety Scale and the TAS. These results suggest that the two scales measure somewhat different aspects of anxiety.

There are numerous experimental studies that provide strong support for the construct validity of the TAS. A review of the literature

(Sarason, 1972a; Wine, 1971) reveals that highly test anxious individuals, as measured by the TAS, consistently perform more poorly than low anxious-persons, particularly when the tasks are administered under stressful, evaluative conditions.

The State Anxiety Scale (A-State) of the State-Trait Anxiety Inventory (Spielberger, Gorsuch, & Lushene, 1970) was utilized to assess the emotional state of the subject immediately subsequent to exposure to the model and to evaluate the level of anxiety experienced during the performance task. The scale consists of twenty statements that require subjects to indicate how they feel at a particular moment in time. Although the scale was constructed to evaluate current feelings of anxiety, Spielberger (1972) has stated that the instructions may be modified to require subjects to indicate the level of anxiety experienced during previous performance tasks. Thus, in the current study, the A-State scale of the STAI was utilized with both standard and modified instructions.

State anxiety is conceptualized as a transitory emotional reaction consisting of consciously perceived feelings of tension and apprehension and heightened autonomic activity. The range of possible scores on the STAI varies from a minimum of twenty to a maximum of eighty on both the A-State and A-Trait subscales.

Since the A-State scale was designed to measure transitory anxiety states, estimates of internal consistency would seem to provide the most appropriate index of reliability. Alpha coefficients for the STAI scales based on normative samples range from .83-.92 (Spielberger, et al., 1970).

The Spatial Visualization subtest (Form B) of the Guilford-Zimmerman Aptitude Survey (1956) was employed as the performance task in this study. The task is considered to estimate the ability to imagine movements, transformations, or other changes in visual objects. The test consists of forty problems which progressively increase in difficulty level. The task has been designed as a speed-test; subjects are allowed ten minutes to perform on the task. The spatial visualization score is based upon the number of correct responses minus one-quarter of the incorrect responses. Rose (1955) has reported a mean score of 9.0 (SD = 6.2) for a normative sample of undergraduate females.

The performance evaluation item was adopted from Holroyd et al. (1978). Estimation of performance in terms of percentile rank relative to other students was measured on a ten point scale (0%-100%).

Subjects' ratings of model affect was measured on a Likert-type scale with values ranging from 1 to 7. One was associated with anxious affect and seven with a relaxed emotional state.

Procedure

All participants were administered the TAS at the time of the study and, initially, subjects were randomly assigned to experimental conditions. Near the completion of the study, the median TAS score was obtained and the number of subjects in each experimental cell was computed. Five subjects were systematically assigned to specific conditions in order to achieve equal cell size.

Upon initial contact with the subject, the experimenter introduced himself and proceeded to provide an explanation of the study. The subject was informed that the experiment was designed to assess the

aptitude of women for various tasks. Informed consent to participate was obtained for each subject (see Appendix A). The subject was then administered the Text Anxiety Scale and was provided with an explanation as to the necessity of this procedure. Briefly, the subject was told that the information on the scale would help to provide a more accurate estimate of her ability (see Appendix B for instructions). Upon completion of the scale, the subject was informed that the level of performance on these tasks was highly related to intellectual capacity and abstract reasoning skills. The subject was then escorted into the experimental room. In the two modeling conditions, a confederate was seated alone at a desk, apparently performing on the spatial visualization task. The subject was directed towards a chair which was located opposite the confederate at a distance of approximately 3 m from the desk. Prior to entrance to the experimental room, the experimenter informed the subject that another individual was currently performing on the task, but that the time limit for the test had almost expired (see Appendix B for instructions). The experimenter immediately exited from the room, presumably to prepare the second task.

In the anxious condition, the model exhibited behavioral and verbal signs of anxiety, while in the non-anxious condition, the model avoided displaying any anxious behavior and appeared to be working steadily and intently upon the task. The non-anxious model also made comments reflecting assurance and a positive attitude. (Complete details of model behavior are described in Appendix C.) In both conditions the subject was exposed to the model for five minutes. During the exposure period, an experimental assistant observed the subject from behind a one-way mirror and recorded the duration of time the subject spent

observing the model. The visual fixation measure was obtained as an aid to later interpretation of the performance and self-report data. For example, estimates of visual fixation time may provide an objective means of measuring differences in the cue-seeking behaviors of high and low test anxious subjects.

Following exposure to the model, the experimenter returned to the room and informed the subject (model) that the time limit for the task had expired. The experimenter supplied the model with the modified form of the A-State scale of the STAI and reviewed the answer sheet of the model. After the model completed the questionnaire, the experimenter provided the model with feedback regarding her performance. The model was informed that her score was within the average range for college women. The experimenter escorted the model to the door and informed her that she was to complete a second task. The subject was then requested to complete the standard form of the A-State scale of the STAI. Following completion of the inventory, the experimenter proceeded to explain the spatial visualization task (see Appendix B for instructions). The subject was informed that she had ten minutes to work on the task. The experimenter made special reference to a stopwatch located on the table approximately .6 m from the subject, indicating that the subject would be able to monitor her time. Duration of time was recorded on an alternate stopwatch.

In the no model condition, the subject was escorted into the experimental room and asked to wait until the experimenter returned from preparing another task. The experimenter arrived five minutes later and administered the A-State scale of the STAI. Prior to administration, the experimenter informed subjects that most participants score within

the average range on the performance task. The subject was then allowed to perform on the spatial visualization task.

In all conditions, the subjects were administered the modified form of the A-State scale and the performance evaluation item immediately following completion of the spatial visualization task. In addition, subjects in the model conditions were requested to rate the emotional state of the model (see Appendix D).

Following completion of the questionnaires, all subjects were informed of the true nature of the study. Subjects were specifically briefed about the use of models and the difficult nature of the performance task. Reactions to these revelations were discussed. All participants were provided with an opportunity for further clarification and discussion of the study if they desired.

Statistical Analysis

A spatial visualization score and performance evaluation estimate were obtained for each subject and a 3 x 2 factorial analysis of variance was employed to analyze the data. The factors were model condition (high anxious model, non-anxious model, and no model) and subject anxiety (high test anxious and low test anxious). A 3 x 2 x 2 split-plot repeated measures design was utilized to analyze the pre- and post-performance STAI A-State scale scores. Model condition and subject anxiety were the between groups factors, while trials (pre- and post-performance) was the within groups factor. A fourth dependent variable, visual fixation time, was subjected to a 2 x 2 analysis of variance, since the measure was obtained only on subjects exposed to the modeling conditions. The specific hypotheses were subjected to one-tailed t tests.

An analysis of covariance was performed on the performance evaluation estimate, with actual performance (spatial visualization scores) as the covariate. Lastly, a 2 x 2 analysis of variance was performed on the model affect ratings to assess the effectiveness of the experimental procedures.

CHAPTER IV

RESULTS

The mean ratings for reported subject impressions of the emotional state of the model are displayed in Table VI in Appendix E. The results of the analysis of variance indicated that subjects perceived the anxious model as significantly more anxious than the non-anxious model, $\underline{F}$ (1,36) = 386.03, $\underline{p} < .001$.

The means and standard deviations for the amount of time subjects observed a model (visual fixation) in the anxious and non-anxious model conditions appear in Table VII in Appendix E. A 2 x 2 analysis of variance yielded no significant results.

Means and standard deviations are presented in Table I for each test anxiety group in each model condition for the spatial visualization scores, pre- and post-performance STAI scores, and performance evaluation estimates. In Table II, the summary table for the analysis of variance for the spatial visualization scores is presented. The main effect for subject anxiety was found to be significant, $\underline{F}$ (1,54) = 7.70, $\underline{p} < .01$. As hypothesized, high test anxious individuals ($\underline{M}$ = 8.25) obtained significantly lower spatial visualization scores than low test anxious subjects ($\underline{M}$ = 13.68). It was expected that high test anxious participants subjected to the anxious model would perform more poorly than high test anxious individuals exposed to a non-anxious model. A

TABLE I

MEANS AND STANDARD DEVIATIONS FOR SPATIAL VISUALIZATION SCORES, PRE- AND POST-PERFORMANCE STAI SCORES, AND PERFORMANCE EVALUATION ESTIMATES

Group		Measure[a] 1	2	3	4
High Test Anxious					
Anxious Model	M	6.08	39.80	47.30	43.50
	SD	6.51	9.62	11.81	21.09
Non-Anxious Model	M	10.98	34.00	40.80	50.00
	SD	6.38	8.64	10.37	21.98
No Model	M	7.70	36.70	47.80	39.50
	SD	6.26	7.69	11.34	9.56
Low Test Anxious					
Anxious Model	M	12.75	28.10	32.20	52.50
	SD	7.18	5.68	7.68	15.50
Non-Anxious Model	M	15.45	31.20	38.40	58.70
	SD	11.48	6.54	10.56	28.85
No Model	M	12.82	33.90	37.40	50.00
	SD	6.21	9.53	9.65	15.09

[a]Measure 1 = Spatial visualization scores.
Measure 2 = Pre-performance STAI scores.
Measure 3 = Post-performance STAI scores.
Measure 4 = Performance evaluation estimates

TABLE II

ANALYSIS OF VARIANCE OF SPATIAL VISUALIZATION SCORES

Source	SS	df	MS	F
Subject Anxiety (A)	441.46	1	441.46	7.70**
Model Conditions (B)	159.10	2	79.55	1.39
A X B	12.77	2	6.39	< 1
W. Cell	3096.76	54	57.35	

**$p < .01$.

one-tailed t test revealed that the difference between these groups was non-significant, t (54) = 1.45, $p > .05$.

The summary table for the analysis of variance of STAI scores appears in Table III. A significant effect for subject anxiety was found, F (1,54) = 11.61, $p < .001$. The mean level of anxiety reported was 41.07 and 33.53 for high test anxious and low test anxious groups, respectively. In addition, the main effects for trials was found to be significant, F (1,54) = 52.96, $p < .001$. Reported subject anxiety levels were significantly lower prior to performance on the spatial visualization task (M = 33.95) than during performance (M = 40.65). Contrary to expectations, no significant difference was obtained between the pre-performance STAI scores of high test anxious subjects exposed to an anxious model and high test anxious individuals subjected to the non-anxious model, t (54) = 1.57, $p > .05$.

The analysis of variance for reported subject evaluation of performance relative to peers appears in Table IV. No significant effects were found; however, the main effect for subject anxiety approached significance, F (1,54) = 3.43, $p < .07$. It was hypothesized that low test anxious individuals would evaluate their performance more positively in relation to peers than high test anxious subjects. Despite the lack of significant differences, further analysis of this a priori hypothesis is justified (Kirk, 1968, p. 110). A one-tailed t test revealed that this difference was significant, t (54) = -1.95, $p < .05$. Low test anxious participants perceived themselves as performing better than 53.7% of their peers while high test anxious subjects evaluated their performance as exceeding 44.3% of their peers.

TABLE III

ANALYSIS OF VARIANCE OF PRE- AND POST-PERFORMANCE STAI SCORES

Source	SS	df	MS	F
Between Subjects				
Subject Anxiety (A)	1702.54	1	1702.54	11.62***
Model Conditions (B)	174.60	2	87.30	< 1
A X B	596.26	2	298.13	2.03
Subjects w/grps.	6913.72	54	146.55	
Within Subjects				
Trials (T)	1346.69	1	1346.69	51.96***
A X T	93.63	1	93.63	3.68
B X T	12.60	2	6.30	< 1
A X B X T	80.07	2	40.03	1.57
T X Subjects w/grps.	1373.00	54	25.42	

***$p < .001$.

TABLE IV

ANALYSIS OF VARIANCE FOR PERFORMANCE EVALUATION ESTIMATES

Source	SS	df	MS	F
Subject Anxiety (A)	1325.39	1	1325.39	3.43
Model Conditions (B)	953.62	2	476.81	1.23
A X B	9.30	2	4.65	< 1
W. Cell	20879.50	54	386.68	

In order to assess the influence of subjects' actual levels of performance on their performance evaluations, subjects' performance evaluations were subjected to an analysis of covariance (see Table V), with actual performance (spatial visualization scores) as the covariate. This analysis of covariance yielded significant results for the covariate only. Thus differences in performance evaluation ratings are related to actual performance rather than subject anxiety and model condition. The original hypothesis was reexamined using performance evaluation ratings adjusted for the covariate. A one-tailed t test, $t(54) = 0.93$, $p > .05$, was not significant, suggesting that subject differences in performance evaluation ratings were not due to a negative evaluative set.

TABLE V

ANALYSIS OF COVARIANCE FOR PERFORMANCE EVALUATION ESTIMATES USING SPATIAL VISUALIZATION SCORES AS COVARIATES

Source	SS	df	MS	F
Covariate	2520.79	1	2520.79	7.28**
Subject Anxiety (A)	266.49	1	266.49	< 1
Model Conditions (B)	474.59	2	237.29	< 1
A X B	21.13	2	10.57	< 1
Error	18358.71	53		

**$p < .01$.

CHAPTER V

DISCUSSION

The results are consistent with previous evidence suggesting that high and low test anxious subjects respond differentially in an evaluative environment (Holroyd et al., 1978; Mandler & Sarason, 1952; Sarason, 1960). In the present study, high test anxious women performed more poorly and reported higher levels of anxiety in an analogue testing situation compared to low test anxious women.

The current replication of earlier findings suggest that the spatial visualization task may be a sensitive measure of performance differences between high and low test anxious individuals. In addition, these results tend to confirm the current conception of test anxiety as a situation-specific trait reflecting individual differences in cognitive and emotional reactions to examination situations (Sarason, 1975b; Spielberger, 1972; Spielberger, Anton & Bedell, 1976). The study seems to indicate that the debilitating effects of test anxiety are not limited to the unique nature of the performance tests of past research but may apply to a wide variety of cognitive-intellectual tasks.

Contrary to expectations, the modeling condition failed to affect the performance and anxiety level of test anxious subjects. It has been hypothesized that high test anxious participants who observed an anxious model would perform more poorly than high test anxious individuals who witnessed a non-anxious model. It was also expected that high test

anxious women would report a higher level of anxiety subsequent to exposure to the anxious model as compared to high test anxious women subjected to a non-anxious model. Neither of these hypotheses was confirmed empirically. These results are inconsistent with previous demonstrations that the affective state of others can serve as an emotion-provoking stimulus to an observer (Craig, 1968; Lazarus, Speisman, Mordkoff, & Davison, 1962). In addition, the present findings fail to substantiate indirect evidence indicating that performance is impaired following interaction with anxious individuals (Sarason, 1973b, 1975a). The data seem to suggest that although differences in model affect were clearly perceived by subjects, the manipulation had an insignificant impact upon subject anxiety level and task performance.

An examination of the characteristics of the subjects employed in the study may provide a possible explanation for the non-significant results. The TAS scores of the high test anxiety group, although significantly more elevated than those of the low test anxious subjects, were not comparable to the TAS scores of high test anxious individuals included in similar studies. The range and mean of the TAS scores for high test anxious subjects in the current study were 15-31 and 20.7, respectively. In contrast, the high test anxious groups utilized in other research (Holroyd, 1976; Holroyd et al., 1978; Sarason, 1972b, 1973a, 1975a) typically exclude individuals with TAS scores below 21.

The possible implications of the low TAS scores of the high test anxious group seem to be reflected in performance scores and reported anxiety levels. Immediately prior to the performance task, the mean anxiety level reported by test anxious subjects on the STAI was 36.83. This rating is essentially equivalent to the mean score (35.12) which

Spielberger et al. (1970) obtained for a normative group of undergraduate women. Similarly, the spatial visualization scores of the high test anxious group are comparable to the scores reported for a normative sample of female college students ($\underline{M}$ = 8.25 and 9.0, respectively). This suggests that the high test anxious individual, although performing more poorly than low test anxious subjects, did not exhibit impaired performance relative to normative data.

These findings suggest that the test anxious group employed in the current study may not be truly representative sample of high test anxious individuals. Rather, it is quite likely that the test anxious group includes individuals who are not particularly test anxious. It is proposed that the presumed heterogeneity of the high test anxious group may have obscured any effect of model affect upon test anxious individuals.

However, it is also possible that the high and low test anxious groups are characteristic of the relative differences in test anxiety at this particular university. Further research is necessary to determine whether these groups represent a biased sample or reflect general differences in test anxiety between the subject populations at various universities.

In the present study, individuals were categorized as high and low test anxious on the basis of the median score of the total group. It is suggested that future research select subjects with TAS scores within the upper and lower quartile of the score distribution. This modification in the methodology would insure clear differentiation between the two groups and provide greater comparability with the test anxious groups described in other studies.

One purpose of the present investigation was to reexamine the surprising results of Jaffe and Carlson (1973). In a study examining the efficacy of modeling as a treatment modality, Jaffe and Carlson (1973) found that subjects exposed to either an anxious or non-anxious model performed better than a control group. The present study failed to confirm these findings. Jaffe and Carlson (1973) hypothesized that an anxious model should be most effective in facilitating the performance of high test anxious persons. In contrast, the current data suggests an opposite, though insignificant, trend; high test anxious subjects attained somewhat higher performance scores following exposure to a non-anxious model than high test anxious participants subjected to an anxious model. It appears that the previously stated reservations regarding the Jaffe and Carlson (1973) study were substantiated by the empirical results of the present investigation; however, this conclusion must be considered as tentative.

As predicted, high test anxious women evaluated their performance more negatively than low test anxious women. In addition, these assessments were strongly related to performance scores. In contrast, Holroyd et al. (1978) found that the performance evaluation of high test anxious women resulted from a biased evaluative set that was uninfluenced by actual test performance, while the evaluations of low test anxious subjects were related to performance scores. It may be that the high test anxious group included individuals who were not test anxious and the heterogeneous nature of the group served to obscure evidence of a negative evaluative set.

It appears that the performance and anxiety level differences obtained between anxiety groups are unrelated to the visual fixation

measure. This suggests that the differences cannot be attributed to the length of time a subject observes a model. Sarason (1972a) contends that the high test anxious individuals are more prone than low test anxious persons to seek environmental cues which might assist them in problem-solving. In the present investigation high and low test anxious subjects did not significantly differ in the length of time spent observing a model. To the extent that visual fixation time provides an index of cue-seeking behavior, these findings disconfirm this hypothesis.

While recognizing that the high test anxious group may not typify test anxious individuals, the results seem to have implications for the use of modeling principles in the treatment of test anxiety. Contrary to the predictions of Wine (1971) and Sarason et al. (1968), the present study fails to demonstrate that exposure to a model who transmits task-attending, non-worrying cues facilitates the test performance of high test anxious women. Rather, it seems that more direct therapeutic interventions are required. Indeed, several studies suggest that a cognitive modification program, involving cognitive training exercises and imagery rehearsal, is one of the most effective treatments for test anxiety (Holroyd, 1976; Meichenbaum, 1972).

In view of the paucity of research concerning the role of model affect upon the test performance anxiety level of test anxious individuals, it would seem appropriate to replicate the present study utilizing the selection procedure described previously. In addition, the methodology could be modified to provide a more realistic test-like situation. This could be accomplished by describing the performance task as a screening device to identify exceptionally gifted individuals.

It would also be interesting to examine the impact of a concurrent model upon test anxious persons. Rather than observing a model prior to the administration of a performance task, the subject would be exposed to the model during the task itself. There is evidence within the social facilitation literature (Geen and Gange, 1977) that the presence of a coactor may serve to increase evaluation apprehension. Another topic for future research might be to assess modeling cues which are incongruent with feedback regarding performance. For example, a test anxious person may be more threatened observing a confident, non-anxious model receive negative feedback than witnessing an anxious model obtain positive feedback. In addition, it may also be informative to investigate sex differences in reactivity to the affective displays of a model.

CHAPTER VI

SUMMARY

In recent years, investigations within the area of test anxiety have focused upon the relationship between observational or modeling opportunities and the subsequent performance behavior of high and low test anxious individuals. Sarason (1972a) claims that modeling provides a variety of informational cues regarding task performance to the observer. Interestingly, the response of test anxious subjects to the affective cues of a model has received little attention. This is rather surprising since it is well known (Bandura, 1969) that the affective cues of a model can produce vicarious emotional arousal in an observer. Jaffe and Carlson (1973) examined the effect of model affect upon the performance of high and low test anxious subjects and obtained results which are contradictory to previous findings in both the test anxiety (Sarason, 1973b, 1975a) and modeling literature (Bandura, 1969). It is suspected that these results were an artifact of the methodology. Hence, further research is warranted.

The present study investigated the effect of the emotional state of a model upon the anxiety and performance levels of high and low test anxious subjects. Sixty undergraduate women were administered the Test Anxiety Scale (Sarason, 1972a) and defined as high and low test anxious subjects on the basis of their score relative to the median. Within each group, ten subjects were exposed to either an anxious model,

non-anxious model, or no model at all. Subjects were requested to complete the STAI A-State scale and then proceeded to perform on the spatial visualization task. Following the performance task, subjects were required to respond to a modified form of the STAI A-State scale and to evaluate their performance. In addition, subjects in the model conditions were asked to rate the emotional state of the model.

As predicted, high test anxious individuals performed more poorly and reported higher levels of anxiety compared to low test anxious subjects. In addition, high test anxious subjects evaluated their performance more negatively than low test anxious subjects. In contrast to previous findings (Holroyd et al., 1978), there was no evidence that high test anxious subjects exhibited a negative evaluative set.

Hypotheses predicting that the model conditions would have a differential effect upon the anxiety level and performance scores of high test anxious subjects were not confirmed. On the basis of previous findings (Sarason, 1975a; Bandura, 1969), it had been expected that high test anxious women exposed to an anxious model would report higher anxiety levels and obtain lower performance scores relative to high test anxious women subjected to a non-anxious model. It was also found that the time spent observing the model did not significantly vary as a function of subject anxiety or model condition.

Future research should include modification of the selection procedure of test anxious individuals. The use of an alternative measure of test anxiety should be considered in view of the recent development of the Test Anxiety Inventory (Spielberger, Gonzalez, Taylor, Algaze, & Anton, 1978). It may be interesting to examine any differential effect of antecedant and concurrent models upon the anxiety and performance level of test anxious individuals.

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APPENDIXES

APPENDIX A

CONSENT FORM

Consent to Participate

I am aware that I will be performing on several problem-solving tasks that are related to intellectual ability and I will be asked to report my attitudes, beliefs, and feelings during the experiment. In addition, I am aware that my responses will remain confidential. Furthermore, I am aware that my participation is voluntary and I may withdraw from the study any time I wish.

_____ I have read and understand the statement above and I am willing to participate.

_____ I have read and understand the statement above and I am not willing to participate.

Name _____

Date _____

Signed _____

APPENDIX B

INSTRUCTIONS PRIOR TO THE ADMINISTRATION OF THE TAS; INSTRUCTIONS SUBSEQUENT TO THE ADMINISTRATION OF THE TAS; INSTRUCTIONS REGARDING THE PERFORMANCE TASK

INSTRUCTIONS PRIOR TO THE ADMINISTRATION OF THE TAS

This study is concerned with the abilities of women on various types of tasks. It is generally known that both men and women seem to have particular talents and skills for different kinds of problem-solvin solving tasks. For example, men seem to perform well on mathematical tests while women appear to score highly on tasks involving verbal abilities. In this study, we're interested in exploring the ability of women two different types of tasks.

However, an individual's emotional state can influence performance in a test-like situation. In order to obtain an accurate estimate of the true abilities of women, it is important to take into account the emotional level that is present during performance tasks. Before you begin the tasks, I'd like you to complete this questionnaire. This questionnaire will provide general information about how you react to test-like situations.

INSTRUCTIONS SUBSEQUENT TO THE ADMINISTRATION OF THE TAS

The first task involves spatial visualization ability. That is, the test measures the ability to imagine movements and changes in visual objects. This task has been found to be related to intellectual ability and general reasoning skills. The experiment will be conducted in this room. Another woman is performing on the task now, but she has only a few minutes left to work on the task. Please have a seat inside, I'm going to another room to prepare another task.

INSTRUCTIONS REGARDING THE PERFORMANCE TASK

This task provides an estimate of spatial visualization ability. This section will provide an introduction to the task. Please read this section and indicate when you have finished.

You will have ten minutes to work on this task. I will place a stopwatch on the table so you will be able to monitor your time. Do you have any questions?

APPENDIX C

BEHAVIOR OF THE MODEL IN THE ANXIOUS CONDITION: BEHAVIOR OF THE MODEL IN THE NON-ANXIOUS CONDITION

BEHAVIOR OF THE MODEL IN THE

ANXIOUS CONDITION

Verbalizations:

1. Things like this really make me nervous.
2. God, that stopwatch makes me jittery.
3. I don't like working under a time limit. I really feel pressured.

These remarks were expressed at approximately 90 sec. intervals, with the first verbalization emitted 90 sec. after the subject entered the room.

Behaviors: The model displayed various anxious behaviors in the following sequence:

Initial 90 sec. interval:

Foot and leg twitching, pencil tapping, manipulation of hair, foot tapping, shifting in chair, fingernail biting, rubbing forehead, verbalization.

Second 90 sec. interval:

Shifting in chair, sighing, erasure of response, manipulation of hair, tapping feet together, rapid pencil movements, pencil tapping, shifting in chair, rubbing hands on legs, leaning forward, foot twitching, verbalization.

Third 90 sec. interval:

Rubbing forehead, manipulation of hair, shifting in chair, foot and leg twitching, fingernail biting, erasure of response, rapid pencil movements, foot tapping, pencil tapping, shifting in chair, rubbing

movements, foot tapping, pencil tapping, shifting in chair, rubbing hands on arms, verbalization.

Final 30 sec.:

Foot twitching, rapid pencil movements, manipulation of hair, pencil tapping.

BEHAVIOR OF THE MODEL IN THE NON-ANXIOUS CONDITION

Verbalizations:

1. I kind of like tests like this, they're really challenging.
2. That was a good one.
3. I enjoy these types of experiments, you get to try something new and different for a change.

These remarks were expressed at approximately 90 sec. intervals, with the first verbalization emitted 90 sec. after the subject entered the room.

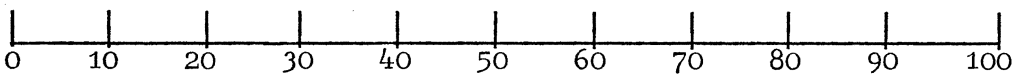
Behaviors: The model appeared calm, relaxed, and absorbed in the task. The model did not manifest any behavioral indicators of anxiety. Rather, the model performed at a steady and consistent pace, answering questions at approximately 20-30 second intervals.

APPENDIX D

POST-TASK QUESTIONNAIRE

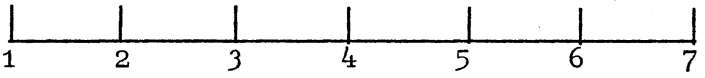
An individual's feelings, attitudes and behaviors are an important aspect of any experimental research effort. The following questionnaire asks for information pertaining to current attitudes as well as information pertaining to your experiences during the experiment. As this is an important part of this study, please answer all questions carefully.

1. How would you rate your performance compared to other women at OSU? (A rating of 50% indicates that you feel that your performance was better than 50% of the women at OSU).



The following question is answered by the use of a scale represented by a line between two extremes. Circle the number which most accurately reflects your answer.

How would you rate the emotional state of the participant who performed immediately before you?

anxious  relaxed

APPENDIX E

MEAN RATINGS FOR REPORTED SUBJECT PERCEPTIONS OF MODEL AFFECT OF HIGH AND LOW TEST ANXIOUS SUBJECTS; MEANS AND STANDARD DEVIATIONS FOR VISUAL FIXATION TIME

TABLE VI

MEAN RATINGS FOR REPORTED SUBJECT PERCEPTIONS OF MODEL AFFECT FOR HIGH AND LOW TEST ANXIOUS SUBJECTS[1]

Group	Anxious Model	Non-Anxious Model
High Test Anxious	1.70	6.4
Low Test Anxious	1.50	6.2

[1]The lower the score the more anxious the model appeared.

TABLE VII

MEANS AND STANDARD DEVIATIONS FOR VISUAL FIXATION TIME (SEC.)

Group		Anxious Model	Non-Anxious Model
High Test Anxious	M	131.89	124.59
	SD	66.99	80.71
Low Test Anxious	M	107.59	117.00
	SD	64.92	50.54

VITA

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