COACTING GROUP EFFECTS ON LEARNING AND PERFORMANCE ACROSS ANXIETY LEVELS

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Stevens, Jimmy L., Coacting Group Effects on Learning and Performance Across Anxiety Levels. Master of Science (Psychology), August, 1972, 53 pp., 8 tables, 1 illustration, bibliography, 42 titles.

The problem with which this study is concerned is that of determining the effects of coacting groups and test anxiety on the learning and performing abilities of children. The basis of this investigation is a theory advanced by Zajonc in 1965, a theory concerning the effects of group situations on various tasks. Zajonc's proposal assumes that the presence of others increases generalized drive and thereby strengthens dominant response tendencies. These dominant response tendencies are incorrect responses in new "learning" situations, yet they are correct responses in well learned "performance" situations.

Recently, the problem of anxiety has been introduced in social facilitation literature. Much of this literature is concerned with the effects of stress upon performance. This stress is often produced artificially by utilizing experimental instructions. It has been hypothesized that this kind of stress is comparable to the condition produced by the presence of others. This approach to social facilitation research indicates that the anxiety and stress conditions tend to interact in such a way that the performance of highly anxious individuals are affected in a detrimental manner.
The purpose of this study is to investigate the effects of small coacting groups and test anxiety on specific "performance" and "learning" tasks. This study also provides a direct test of Zajonc's theory.

The hypotheses state that under the coacting group condition, the performance task would be facilitated and that the learning task would be attenuated. Also, there would be a significant interaction between the condition and level of test anxiety with the coacting group condition, an interaction that would prove to be detrimental to the highly test-anxious subjects.

The subjects were 145 fifth grade students at Central Elementary School in Lewisville, Texas. Two independent 2 x 2 factorial analysis of variance designs were utilized. The generalized social facilitation effect did not occur in either the performance task or learning task results. The interaction effect did not significantly affect the performance task, but it did have an effect on the learning task.

The findings do not support a generalized social facilitation theory. The results do indicate, however, that the interaction of anxiety with group situations is productive of a poor learning environment for some tasks but not for others. It is concluded that personality variables and other specific tasks should be systematically studied in similar contexts.
COACTING GROUP EFFECTS ON LEARNING AND PERFORMANCE ACROSS ANXIETY LEVELS

THESIS

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By

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CHAPTER I

INTRODUCTION

One of the earliest experimental models for the investigation of the effects of social facilitation was incorporated in a study by Triplett in 1898 (8). Commenting on this paradigm, Triplett states, "The bodily presence of another contestant participating simultaneously in the race [bicycle racing] serves to liberate latent energy not ordinarily available." Since that time, the literature of social psychology has always contained a relatively large amount of material on the subject of social facilitation.

Social facilitation is one of the fundamental approaches to the study of the effects of "social" situations. Social facilitation is concerned with the effects individuals have on one another. The effects of one individual on another have been studied with the use of audience and coacting groups. Studies of audience-effect involve an individual's behavior when it occurs in the presence of passive spectators. The spectators are only present, and they do not actively enter into the situation. In studies utilizing coacting groups, the behavior of individuals are simultaneously engaged in the same activity. The individuals are in full view of each other, but they work independently (1, pp. 261-291).
Both of the above mentioned experimental paradigms have been utilized extensively in the research on social facilitation throughout the earlier part of this century (7, pp. 91-110; 10; 11, pp. 10-24).

The question of the effect of the presence of others upon performance has been investigated for over seventy years. Many research studies have attempted to solve this problem, but the area of social effects has not yet been fully illuminated.

In 1910, Burnham offered the general conclusion: "The question is relative to the kind of work done. . . . For some kinds of work the stimulus of the social group is needed. For some kinds of work . . . the environment of solitude is better" (2). At the present time, Burnham's statement is still applicable, and the applicability of this statement exemplifies the status of the area of social effects upon performance.

Some proposals have shown considerable promise in specifying the conditions which produce social facilitation effects and the conditions which produce social inhibition effects. One proposal that has received considerable recognition is Zajonc's theory (10), which suggests that the presence of others encourages dominant responses by increasing the individual's general drive level. If the dominant responses are correct, as they are in the performance of previously acquired skills, then the presence of others will result in a better performance. If, however, dominant responses are largely incorrect, as they are in the early stages of learning, then the presence of others
will delay the acquisition of correct responses by augmenting the incorrect ones. Zajonc's theory produces a plausible explanation of past social effect studies (9). The theory has received some support since its conception (11; 37; 7, pp. 94-96; 4; 5; 6).

In recent years, the study of anxiety has been introduced in social facilitation research. This personality variable has received some extensive research in its own right, and there are some implications of anxiety research in relation to audience effects.

The implication stems from the studies investigating the relationship of anxiety to performance under conditions of personal threat or stress. From the findings of this research, it could be hypothesized that if group situations are perceived as more threatening or stress inducing than working alone, then individuals differing in anxiety would respond differently to the presence of an audience. The performance of highly anxious individuals would be more detrimentally affected than would the performance of less anxious individuals.

Due to the contradictory findings in social facilitation research and the limited number of studies relating group effects and anxiety levels on different tasks, the present experiment was performed.

Statement of the Problem

A theory was formulated by Zajonc that appeared to account for the numerous contradictions in studies investigating audience
and group effects on performance. Essentially, this theory stated that in group situations, dominant responses are encouraged by increasing an individual's general drive level. This results in group conditions, which facilitate performance and attenuate learning. Recently, anxiety as a variable was introduced into social facilitation studies. Based on these anxiety studies, it could be hypothesized that if group situations were stress inducing, then the group condition and anxiety would interact to produce differential levels of performance. This approach to the study of social facilitation has been utilized infrequently.

The present study was performed to add to the limited literature connecting anxiety, specifically test anxiety, and group effects to performance. Zajonc's theory is also tested by utilizing both a specific "learning" task and "performance" task.

Hypotheses

In the present experiment, the effects of working alone and in small coacting groups were investigated in fifth grade children. Both a "performance" task and a "learning" task were performed in each condition, and both high and low test anxious children were included. The effect of the interaction of anxiety level and group performance was analyzed in respect to Zajonc's theory; a specific "performance" task and a specific "learning" task were required. It was felt that the experiment would help clarify research in this field.
In the present experiment the pertinent implication of social facilitation and anxiety effects on performance were investigated. The investigation was performed to empirically test four specific experimental hypotheses.

**Hypothesis 1**—Under experimentally induced, personal threat (coacting groups), the "performance" task will be facilitated.

**Hypothesis 2**—On the "performance" task, there will be a significant interaction between condition and level of test anxiety. The coacting group condition would be more detrimental to the highly test-anxious subjects than to the less test-anxious subjects.

**Hypothesis 3**—Under experimentally induced, personal threat (coacting groups), the learning task will be attenuated.

**Hypothesis 4**—On the "learning" task, there will be a significant interaction effect between condition and level of test anxiety. The coacting group condition would be more detrimental to the highly anxious subjects than to the less test-anxious subjects.
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CHAPTER II

REVIEW OF LITERATURE

The survey of literature includes separate reviews of the pertinent research on social facilitation, anxiety, and studies on the integration of these areas.

Studies Related to Social Facilitation

Social facilitation studies have produced contrasting results. Some show that the presence of individuals facilitates performance of certain tasks, and others show that the presence of individuals is detrimental to performance.

In 1965, Zajonc (35) reviewed past literature on social effect and formulated a theory to account for the contradictory findings. He reviewed the tasks involved in the past literature on audience and coacting group effects and postulated that the presence of others encourages dominant responses by increasing the individual's general drive level. One result found consistently in previous research was that an audience impaired the acquisition of new responses and facilitated the emission of well-learned responses. The acquisition of new responses is called "learning," and the emission of previously learned responses is called "performance" (34, 10). If, for a given experimental task, dominant responses are largely correct ones, as they are in the performance of previously acquired skills, then
the presence of others will result in a better performance. If, however, dominant responses are largely incorrect, as they are in the early stages of learning, then the presence of spectators will delay the acquisition of correct responses by augmenting the incorrect ones. Zajonc's theory was based on past experimental research studying the effect of the presence of others on individuals engaged in various tasks. These studies, showing the basis of Zajonc's theory, will be presented now.

Travis (32) found that simple motor responses are particularly sensitive to social facilitation effects. He trained college students on the pursuit-rotor task for several consecutive days until performance reached a stable level. After the subjects had mastered the task, each was given ten trials alone and then ten trials in the presence of passive spectators. Travis found a clear improvement in performance when his subjects were confronted with an audience.

Berger and Lehr (4) utilized a simple discrimination task under isolated and observed conditions. The accuracy of the observed subjects (military personnel) was 34 per cent higher than the accuracy of the subjects working in isolation.

Dashiell (9) used college students as subjects and showed that under audience observation, there was a significant improvement in their working performance of multiplication problems.

Allport (1) used adult graduate students as subjects and found that the performance of multiplying two digit numbers was
improved in the presence of a co-working group. In a chain association task, Allport (1) found an increase in speed and quantity of work due to audience effects. The results also showed that the greater the degree of activity in progress, the stronger the effect of social facilitation upon it. This is to say, during the first minute when associations come readily, social stimulation produces a greater addition of speed than toward the end of the task when, through fatigue and the exhaustion of ready responses, the facility of association has decreased.

Allport (1) also utilized the simple task of canceling vowels from a newspaper. Subjects were adult graduate students, and the results showed that performance was better in groups than in isolated conditions.

Pessin (15) found that college students asked to learn lists of nonsense syllables under two conditions, alone and in the presence of several spectators, responded differently. Observed by an audience, the subjects required an average of 11.27 trials to learn the list. When working alone, they needed only 9.85 trials. Also, the average number of errors made in the observed condition was higher than the number in the isolated condition.

Pessin and Husband (16) used college students in the study of the effects of an audience on performance of a finger maze and found that the presence of spectators interfered with learning.
Allport (1) studied the effects of problem-solving tasks under group and isolated conditions. The study required written responses disproving arguments of ancient philosophers. The overt responses, such as writing, received facilitation through the stimulus of co-workers. The intellectual or implicit responses of thought were hampered by the co-workers rather than facilitated.

Zajonc's theory appears to account for the above mentioned contradictions. On tasks where responses were well learned, as was the case of vowel cancellation, pursuit-rotor, simple discrimination, multiplication, and chain association, the results were facilitated in audience conditions. Conversely, tasks requiring the acquisition of new responses, as was the case of nonsense syllable learning, finger maze learning, and problem solving, obtained results which were impaired by the presence of others.

Studies Related to Anxiety

Existing studies of anxiety literally defy summary as a unit. However, it is possible to discern trends where anxiety scales have been employed. Anxiety research that is relevant to the study of social facilitation effects will be reviewed at this time.

Several studies have investigated the relationship of anxiety to performance. Research indicates that highly anxious individuals differ from less anxious individuals when their performance is disrupted by conditions of personal threat or stress.
These stressful situations have been introduced in various ways, such as utilizing motivating instructions which contain threatening elements and reporting failure. It is these studies that will be reviewed at this point.

Sarason has numerous studies in this area (18, 20). He found that highly anxious subjects were affected differently by conditions using instructions giving different degrees of motivation. High level anxiety subjects were obtained by taking extreme scores on the Taylor Manifest Anxiety Scale (31). Motivating instructions were used, stating that the subjects were about to take an intelligence test. A control group receiving no motivating instructions was utilized. The subjects were introductory psychology students, and the task was nonsense syllable learning. These two studies showed that the highly anxious subjects were detrimentally affected by the motivating instructions while the less and least anxious subjects were facilitated in their learning by the motivating instructions.

Sarason (20) investigated the same task, utilizing failure reporting as the stressful condition. The finding was that when failure reports were administered, highly anxious subjects were adversely affected.

Lucas (13) used failure reports as the stressful condition and found that a greater number of failures reported resulted in a more superior performance on the part of the least anxious subjects.
Sarason (22) performed a study concerning the relationship of different measures of anxiety and experimental instructions to word-association test performance. He administered the Test Anxiety Scale (21), the Bending (3) revision of the Taylor Manifest Anxiety Scale, and the Lack of Protection Scale (21). The stress inducing instructions were that the subjects were about to take a personality test. A control group received no stress inducing instructions. The results indicated that the highly anxious experimental groups had greater discrepancy scores than the less anxious subjects. There were no significant differences in sensitivity to personal threat instructions.

Sarason and Polola (24) investigated the possibility of interactions of anxiety, task difficulty, and differential motivating instructions affecting the performance of individuals. Two measures of anxiety, one general and one specific to testing situations, were employed. The tasks were digit symbol and arithmetic problems. Significant interactions emerged in each of the experiments. Test anxiety was related to subjects' performance more frequently than was general anxiety, and in general it appeared that highly difficult tasks and highly motivating instructions combined to affect detrimentally the performance of highly anxious subjects.

The bulk of the findings investigating the relationship of anxiety to performance in stressful situations suggests that highly anxious individuals are affected more detrimentally by motivating conditions or failure reports than are less anxious
individuals. Consistent with this assumption is the general finding that there are no differences among groups differing in scores on anxiety scales when tested under neutral, non-threatening conditions.

Studies Related to Social Facilitation and Anxiety

In recent years, social facilitation and anxiety research have been integrated. Research in anxiety and stressful situations indicates that if group situations are perceived as more threatening or stress inducing than working alone, then these situations could substitute for the manipulating of instructions or reporting of failure to produce stressful situations (37, 38). This approach to the possible interaction of group influence and anxiety would make it possible to explain some of the inconsistent findings in past social facilitation research. One would expect different levels of performance for individuals differing in anxiety when working in groups. The implication of this approach is that the performance of highly anxious individuals would be more detrimentally affected than would the performance of less anxious individuals. Studies pertaining to this relationship of social facilitation and anxiety will be reviewed in this section.

Ganzer (11) attempted to relate social influence and anxiety in the manner stated in the preceding paragraph. The subjects were female undergraduate students, and a serial learning task was performed. Scores on the Test Anxiety Scale were used to
distinguish three levels of test anxiety. The investigators predicted that the performance of highly anxious individuals would be more detrimentally affected when an audience was present than that of less anxious individuals. This hypothesis was supported. The presence of an audience exerted a more detrimental influence on highly and less test-anxious individuals as opposed to the least anxious individuals. The fact that subjects who attempted to learn new material in the presence of an audience did less well than subjects who learned alone provided some support for Zajonc's theory that audience presence is detrimental to the learning of a new task.

Quarter and Marcus (17) tested Zajonc's theory by using a digit span test as the dependent variable. High and low test anxiety and audience presence and absence conditions were the independent variables. The level of test anxiety of eighth grade students was determined by administration of the Achievement Anxiety Scale (2). A significant audience effect occurred. The subjects working in the presence of an audience performed more poorly than those working alone; however, the condition interaction was not found.

Pederson (14) attempted to expand the scope of the relationship between test anxiety and group situations. Male undergraduate students were administered the Test Anxiety Scale (25). The subjects were drawn from the upper, middle, lower thirds of the scale distribution. The subjects worked on a paired associate learning task and two performance tasks (vowel cancellation
and multiplication problems) in isolated and small group conditions. The results of the performance tasks did not support Zajonc's formulation. The results of the learning task only tentatively supported his formulation, since a significant trials effect did occur. As learning progressed, individuals in groups did not continue to learn at as high a rate as those learning alone. Generally, the results indicated that there is a relatively complex interaction between personality characteristics of subjects, the conditions under which they work, and the type of task involved.
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CHAPTER III

METHOD

Subjects

The subjects used in the present study were 145 children representing the entire fifth grade population of Central Elementary School in Lewisville, Texas. Lewisville is a suburban area of the Dallas metropolitan region. The school represents a cross-section of lower middle socio-economic families. The number of males and females was seventy-three and seventy-two, respectively, and their chronological ages ranged from ten to eleven years.

Instrument

The criteria for level of test anxiety of the subjects were determined by the administration of the Test Anxiety Scale for Children (3). A copy of the TASC and directions for administration can be found in Appendix A. The TASC is composed of thirty questions which are to be answered yes or no. The test-anxiety score is computed by counting the number of affirmative answers. The possible scoring limits range from one to thirty. The higher the number of positive responses, the higher the test anxiety.

The authors of this scale (3) reported test-retest (two-month interval) reliability data of .71 on all grades from two
to five and .82 on the fifth grade in particular. Split-half reliability on the same subjects yielded a correlation coefficient of .79 on all grades.

Initial validity studies yielded significant correlation coefficients between the TASC and teacher's rating. Also, an expected significant negative correlation was obtained between the TASC and intelligence.

Tasks

The acquisition of new responses is called "learning" and the emission of previously learned responses is called "performance" (4). The tasks used in the present study were chosen in regard to this criteria.

The performance task consisted of thirty problems requiring the summation of two three-digit numbers. At the fifth grade level, the student is very familiar with addition. A copy of the problems can be found in Appendix B.

The learning task consisted of twelve high association value paired-associate words taken from a list produced by Di Vesta (1). A copy of the list can be found in Appendix C. The list was prerecorded on a cassette tape by a female research assistant.

Experimental Design

The experimental design employed in the present study is two 2 x 2 factorial analysis of variance. These designs are independent of each other, representing the two different tasks.
Each treatment group contained ten subjects (2, pp. 207-243). The independent variables are the isolated and coacting groups and the level of test anxiety.

A schematic presentation of the experimental design is presented in Figure 1.

<table>
<thead>
<tr>
<th>Test Anxiety Level</th>
<th>Condition</th>
<th>Isolated</th>
<th>Coacting</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>N=10</td>
<td>N=10</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>N=10</td>
<td>N=10</td>
<td></td>
</tr>
</tbody>
</table>

Fig. 1—Experimental design model

Numbers in the cells represent the number of subjects assigned to each task. This same design and the same number of subjects in each cell were utilized for both the learning and performance experiments.

The procedure for the distribution of the subjects within the design presented above will be described. The total 145 students were administered the Test Anxiety Scale for Children (3) in groups of approximately 25. From the total 145 scales, 14 were deleted because the children were not full-time, regular classroom students or because they failed to understand the questionnaire. From the remaining 131 scales, the top 40 scores and the bottom 40 scores were selected to represent the high and the low test anxious groups, respectively. The distribution of TASC scores in the present study ranged from three to thirty, with a
mean of 18.2 and a standard deviation of 5.97. It was thought that these ranges would indicate two clearly dichotomous test-anxious groups. The less test-anxious group obtained TASC scores from four to sixteen, with a mean of 11.65 and a standard deviation of 3.29. The highly test-anxious group obtained TASC scores from twenty-two to thirty, with a mean of 24.9 and a standard deviation of 2.38.

The two anxiety groups were randomly divided into halves by the method of "captive assignment," in which each subject was assigned a number and the numbers were placed in a receptacle. The first twenty numbers drawn represented one group, and the remaining twenty numbers represented the other group. The two groups were to participate in two independent tasks. Randomization procedures were utilized in determining which subjects would perform which task and under what condition, either alone or in coacting groups. This was to assure that the research outcome did not depend on a particular fortuitous selection of participants. Extraneous factors such as race, sex, intelligence, and ethnic differences were also controlled by this random assignment of the subjects to the various treatments. Tables I, II, III, and IV represent the final subject assignment. The different treatment conditions with the anxiety criteria ranges are presented along with their means and standard deviations. Sexual differences for each treatment group can also be observed.
### TABLE I

MEANS AND STANDARD DEVIATIONS FOR ANXIETY CRITERIA RANGES WITH DISTRIBUTION OF MALES AND FEMALES FOR THE ISOLATED CONDITIONS ON THE PERFORMANCE TASK

<table>
<thead>
<tr>
<th>Level of Test Anxiety</th>
<th>Isolated Condition</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ranges</td>
<td>M</td>
<td>SD</td>
<td>Males</td>
<td>Females</td>
</tr>
<tr>
<td>High</td>
<td>22-28</td>
<td>24.6</td>
<td>2.00</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Low</td>
<td>7-16</td>
<td>12.7</td>
<td>3.02</td>
<td>4</td>
<td>6</td>
</tr>
</tbody>
</table>

### TABLE II

MEANS AND STANDARD DEVIATIONS FOR ANXIETY CRITERIA RANGES WITH DISTRIBUTION OF MALES AND FEMALES FOR THE COACTING GROUP CONDITIONS ON THE PERFORMANCE TASK

<table>
<thead>
<tr>
<th>Level of Test Anxiety</th>
<th>Coacting Group Condition</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ranges</td>
<td>M</td>
<td>SD</td>
<td>Males</td>
<td>Females</td>
</tr>
<tr>
<td>High</td>
<td>23-30</td>
<td>24.6</td>
<td>2.37</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Low</td>
<td>4-16</td>
<td>10.6</td>
<td>4.01</td>
<td>6</td>
<td>4</td>
</tr>
</tbody>
</table>

### TABLE III

MEANS AND STANDARD DEVIATIONS FOR ANXIETY CRITERIA RANGES WITH DISTRIBUTION OF MALES AND FEMALES FOR THE ISOLATED CONDITIONS ON THE LEARNING TASK

<table>
<thead>
<tr>
<th>Level of Test Anxiety</th>
<th>Isolated Condition</th>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Ranges</td>
<td>M</td>
<td>SD</td>
<td>Males</td>
<td>Females</td>
</tr>
<tr>
<td>High</td>
<td>22-30</td>
<td>25.2</td>
<td>2.30</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>Low</td>
<td>4-14</td>
<td>10.1</td>
<td>3.34</td>
<td>5</td>
<td>5</td>
</tr>
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</table>
TABLE IV

MEANS AND STANDARD DEVIATIONS FOR ANXIETY CRITERIA RANGES WITH DISTRIBUTION OF MALES AND FEMALES FOR THE COACTING GROUP CONDITIONS ON THE LEARNING TASK

<table>
<thead>
<tr>
<th>Level of Test Anxiety</th>
<th>Coacting Group Condition</th>
<th>M</th>
<th>SD</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ranges</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>High</td>
<td>22-30</td>
<td>25.2</td>
<td>2.90</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Low</td>
<td>7-15</td>
<td>12.2</td>
<td>2.76</td>
<td>4</td>
<td>6</td>
</tr>
</tbody>
</table>

Procedure

Two independent tasks were performed in one of two conditions, either alone or in small, coacting groups. The designation of group members was predetermined by the randomization method of "captive assignment." The ten subjects to participate in a group condition were assigned a number from one to ten, and the ten numbers were placed in a receptacle. The first three numbers drawn represented one coacting group, the second three numbers drawn represented another group, and the remaining four numbers represented the last group. This process was used to assign subjects in all group conditions.

The subjects were ushered into the experimental room according to a daily schedule distributed to the five participating teachers. The room was approximately 10' by 10', and it was furnished with a long table (approximately 4' by 8'), a small desk, and five chairs. The subjects in the isolated condition sat in the center of the table facing the wall. The
subjects working in coacting groups sat beside three or four other subjects, all facing the wall and separated from one another by one-foot cardboard partitions. The experimenter was present in all conditions and sat behind the subjects. The appropriate test booklets and pencils were on the table before the subjects entered.

The instructions for the performance task were identical for all subjects, whether they were highly or less test-anxious or working alone or in coacting groups. The experimenter told the subjects that they were to work the addition problems on the sheet before them. It was explained that they did not have to finish but that they were to work as many as they could. They were instructed to work on the problems until they were told to stop.

The instructions for the learning task were identical for all subjects, whether they were highly or less test-anxious or working alone or in coacting groups. The subjects were told that they were going to hear a list of pairs of words and that they were to listen carefully and learn what two words went together. A tape recorder was used to present the list of twelve paired associates (1) at five-second intervals. After one complete presentation of the list, the experimenter told the subjects to turn to the first page of the booklet. The answer booklet had each stimulus word followed by a blank along the left side of each page. The response words were randomly arranged in a row along the top of each page.
The subjects were instructed to fill in the blanks with the correct word from the top of the page. They were to turn the booklet over when they were finished. When all were through with the first page, the twelve paired associates were again presented. This procedure was repeated until the three pages of the booklet had been completed.

After both tasks, the subjects were assured that no one except the experimenter would see the results of the tasks. They were asked not to discuss the material with any of the other children and were thanked for their participation.
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CHAPTER IV

RESULTS AND DISCUSSION

Results

The obtained results and a statistical analysis of those results are illustrated in this chapter. Two independent 2 x 2 factorial analysis of variance designs were utilized in this experiment. One is the result of the performance task, and the other is the result of the learning task. These two designs and the analysis are presented separately. The level of significance is set at .05.

Table V contains the means of each of the four groups involved in the performance task in this study. The means reported represent the number of addition problems correctly worked in three minutes.

TABLE V

MEANS OF CORRECT RESPONSES FOR THE TREATMENT CONDITIONS ON THE PERFORMANCE TASK

<table>
<thead>
<tr>
<th>Test Anxiety</th>
<th>Condition</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Isolated</td>
<td>Coacting Group</td>
<td>Totals</td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>18.1</td>
<td>13.2</td>
<td>15.65</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>19.3</td>
<td>16.8</td>
<td>18.05</td>
<td></td>
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<tr>
<td>TOTALS</td>
<td>18.7</td>
<td>15.0</td>
<td>16.85</td>
<td></td>
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</tbody>
</table>
Also, this table includes the total mean scores for the different conditions and level of test anxiety classifications. The cells across the bottom row are the total mean scores of the two conditions. The cells on the far right are the total mean scores for the different levels of test anxiety. The cell on the far right, bottom, is the total mean score for both conditions and classifications of test anxiety.

Table VI is a summary of the complete analysis of variance of the performance scores.

**TABLE VI**

COMPLETE ANALYSIS OF VARIANCE OF THE PERFORMANCE SCORES

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between conditions</td>
<td>176.40</td>
<td>1</td>
<td>176.40</td>
<td>7.513*</td>
</tr>
<tr>
<td>Between anxiety</td>
<td>84.10</td>
<td>1</td>
<td>84.10</td>
<td>3.569</td>
</tr>
<tr>
<td>Interaction: C X A</td>
<td>4.90</td>
<td>1</td>
<td>4.90</td>
<td>0.000</td>
</tr>
<tr>
<td>Within groups (error)</td>
<td>844.20</td>
<td>36</td>
<td>23.48</td>
<td>. . .</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>1,109.60</td>
<td>39</td>
<td>. . .</td>
<td>. . .</td>
</tr>
</tbody>
</table>

*P < .05

Hypothesis 1 of the study states that in the coacting group condition, the performance task results would be facilitated. This is not the case. There is a significant difference.
between the conditions \((F=7.513, df=1/36, P<.05)\), but an inspection of the mean totals presented in Table V reveals that the performance task results are in favor of the isolated condition.

Hypothesis 2 of the study states that there would be a significant interaction effect. This interaction did not occur; thus, the hypothesis is not supported.

Table VII contains the means of each of the four groups involved in the learning task in this study. The means reported represent the number of correct associations on the third trial of the learning task. In addition, this table also includes the total mean scores for the different conditions and level of test anxiety classifications. The cells across the bottom row are the total mean scores of the two conditions.

**TABLE VII**

**MEANS OF CORRECT RESPONSES FOR THE TREATMENT CONDITIONS ON THE LEARNING TASK**

<table>
<thead>
<tr>
<th>Test Anxiety</th>
<th>Condition</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Isolated</td>
<td>Coacting Group</td>
<td>Totals</td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>9.60</td>
<td>7.20</td>
<td>8.40</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>9.10</td>
<td>10.70</td>
<td>9.90</td>
<td></td>
</tr>
<tr>
<td>TOTALS</td>
<td>9.35</td>
<td>8.95</td>
<td>9.13</td>
<td></td>
</tr>
</tbody>
</table>
The cells on the far right are the total mean scores for the different levels of test anxiety. The cell on the far right, bottom, is the total mean score for both conditions and classifications of test anxiety.

Table VIII is a summary of the complete analysis of variance of the learning scores.

**TABLE VIII**

**COMPLETE ANALYSIS OF VARIANCE OF THE LEARNING SCORES**

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between conditions</td>
<td>11.10</td>
<td>1</td>
<td>11.10</td>
<td>2.07</td>
</tr>
<tr>
<td>Between anxiety</td>
<td>22.50</td>
<td>1</td>
<td>22.50</td>
<td>4.19*</td>
</tr>
<tr>
<td>Interaction: C X A</td>
<td>30.50</td>
<td>1</td>
<td>30.50</td>
<td>5.69*</td>
</tr>
<tr>
<td>Within groups (error)</td>
<td>193.00</td>
<td>36</td>
<td>5.36</td>
<td>. . .</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>257.10</strong></td>
<td><strong>39</strong></td>
<td><strong>. . .</strong></td>
<td><strong>. . .</strong></td>
</tr>
</tbody>
</table>

*P < .05

Hypothesis 3 states that the learning task results would be attenuated in the coacting group condition. Because the results showed no significant difference between the two conditions, this hypothesis was not supported.

Hypothesis 4 states that there would be a significant interaction effect with the condition of the coacting group being more detrimental for the highly test-anxious subjects than for
the less test-anxious subjects. The interaction occurred
\((F=5.69, \text{df}=1/36, P < .05)\); thus the hypothesis is supported.

It is interesting to note that there was a significant
difference between the two levels of test anxiety with the
less test-anxious subjects performing better than the highly
test-anxious subjects.

Discussion

The results of this study will be discussed in terms of
the specific hypothesis tested and also in relation to pre-
vious research findings and implications. This section also
includes criticism of the present study, along with sugges-
tions for additional research.

In reference to Hypothesis 1, the results were the exact
opposite to what was predicted. This is contrary to what Za-
jonc hypothesized in 1965 (5). His interpretation assumes
that coacting groups increase the generalized drive level and
thus strengthen dominant response tendencies. On the perform-
ance task, this tendency would be to make correct responses;
thus, a facilitation effect should occur in the group condition.
This was not the case in either level of test anxiety.

An explanation for this result could be that the pres-
ence of the experimenter could have been sufficient to offset
any stress differences assumed to occur in the different con-
ditions. Another explanation might be that the task employed
was not adequate as a "performance" task. Previous research
has not utilized addition tasks, but this is considered a justifiable performance task since fifth grade students are accustomed to working addition problems.

Hypothesis 2 states that there would be a significant interaction effect with the coacting group's condition being more detrimental for the highly test-anxious subjects. The interaction did not occur, and an explanation can only be suggested.

Group conditions are assumed to produce stressful situations. Previous research (6) indicates this, but it is possible that the variables involved in the present study interacted to produce a different type of stress or perhaps to produce no stress at all.

Hypothesis 3 is not supported by the results of the learning task. This hypothesis states that the learning task would be attenuated in the coacting group condition. The results are contrary to Zajonc's formulation (5). The experimenter's presence and the possible inadequacy of the task as representing a "learning" task, as mentioned in discussion of Hypothesis 1, could account for this lack of significance.

Hypothesis 4 states that there would be a significant interaction between condition and level of test anxiety with the coacting group condition being more detrimental for the highly test-anxious subjects than for the less test-anxious subjects. The results support this hypothesis, indicating that the coacting group has a facilitative effect on the less test-anxious subjects, while it had a detrimental effect on the highly
test-anxious subjects. This result is consistent with previous studies concerning stressful situations and anxiety.

The results of Hypotheses 1 and 3 make it difficult to interpret the findings in regard to Zajonc's theory. Had his theory been successful, the results would have shown the facilitation of the performance task and the attenuation of the learning task in the presence of others. The findings are more in accord with a habit interpretation (1) along with the interaction of test anxiety in group situations. This interpretation states that high and low scores on anxiety scales differ in the kinds of response tendencies aroused by threatening situations. Highly anxious individuals respond to threat with habitual, personalized responses. These responses are essentially not related to tasks; thus, they interfere with efficient learning and performance. Less anxious individuals do not respond in this manner and may be expected to react to threats or stress with increased effort and attention.

This interpretation would account for the learning task results. Inspections of the means in Table III show that in the stress producing conditions, the low anxious subjects did not respond to the task in a way that was detrimental to their results when compared to highly anxious individuals. The highly anxious subjects did respond in a way detrimental to their performance.

Another result of the learning task analysis is manifested as a significant difference between the two levels of test
anxiety. The less test-anxious subjects performed better than the highly test-anxious subjects ($F=4.19$, $df=1/36$, $P<.05$). This effect is difficult to interpret considering the means presented in Table VII, which shows that this only occurred in the group condition. The implication is that the highly test-anxious subjects were detrimentally effected by the group situations, while the less anxious subjects were not.

The present study does not generally support the predictions, but the learning task results are fairly consistent with recent related literature (2, 3). Possibly future research should investigate the variability of the stress-producing situations and different personality variables in relation to the performance of specific tasks. The current related research has utilized the college undergraduate student to a great extent. It appears the applicability of research on task performance would be more beneficial if the emphasis was to be placed on the child who is constantly confronted with essential learning situations.
CHAPTER BIBLIOGRAPHY


CHAPTER V

SUMMARY AND CONCLUSIONS

Summary

The present study was designed to determine the effects of coacting groups on both performance and learning tasks across anxiety levels. The basis of this research was the theory presented by Zajonc in 1965 concerning the facilitation effects of group situations on performance and learning tasks (4). Briefly stated, this interpretation assumes that coacting groups increase generalized drive and thereby strengthen dominant response tendencies. These dominant response tendencies are incorrect responses in new "learning" situations and correct responses in "performance" situations.

In recent years, anxiety has been introduced in social facilitation research. Research on anxiety indicates that persons differing in anxiety respond differently in the presence of an audience. The performance of high-anxious individuals would be more detrimentally affected than would the performance of less anxious individuals.

The subjects were 145 fifth grade students of Central Elementary School in Lewisville, Texas. Extraneous factors such as race, sex, and ethnic differences were controlled by the random assignment of the subjects to the various treatments.
The basic design was two independent $2 \times 2$ factorial analysis of variance. One design was concerned with the performance task results, and the other was concerned with the learning task results. The conditions were isolated and coacting group conditions and high and low test anxiety. Test anxiety was determined from the Test Anxiety Scale for Children (3). The extreme forty scores were selected as representative of highly and less test-anxious subjects.

The performance task was thirty, three-digit numbers to be summed. The learning task consisted of twelve high association value paired-associate words taken from the list produced by Di Vesta (2).

The procedure consisted of taking the children from their classroom and seating them at a table in the experimental room. The subjects in the isolated condition sat in the center of the table and the ones working in coacting groups sat beside the other subjects, separated by one foot partitions.

The instructions for the performance task (thirty addition problems) were identical for all subjects, regardless of their test anxiety classification and the condition in which they worked. The instructions for the learning task (twelve paired-associates) were identical for all subjects, regardless of their anxiety classification and the condition in which they worked.

The results were based on the number of correct problems worked in the performance situation and the number of correct associations on the final trial in the learning situation.
Hypothesis 1 stated that the performance task would be enhanced under the coacting group condition. The results of the data did not support this.

Hypothesis 2 stated that there would be an interactive effect between the condition and level of test anxiety. This was not supported.

Hypothesis 3 said that the coacting group condition would be detrimental to the results of the learning task. The analysis showed no difference between the conditions and thus did not support the hypothesis.

Hypothesis 4 said that there would be an interactive effect between the condition and level of test anxiety. The results supported this hypothesis with the coacting group condition being detrimental for the highly test-anxious subjects and facilitative for the less test-anxious subjects.

Conclusions

This investigation indicated that generalized social facilitation effects due to coacting group membership did not occur in the performance or learning situation. The results of the learning task are more consistent with the habit interpretation of anxiety and the interaction of test anxiety with group situations (1). This interpretation states that highly test-anxious subjects respond to threat with habitual personalized responses which are not related to task; thus, they interfere with efficient learning and performance. Less anxious individuals do
not respond in this manner and may be expected to react to threat of stress with increased effort and attention.
CHAPTER BIBLIOGRAPHY


APPENDIX A

TEST ANXIETY SCALE FOR CHILDREN

The Test Anxiety Scale for Children (TASC) consists of thirty questions which are read to the class with the following instructions:

I'm going to be asking you some questions--questions different from the usual school questions for these are about how you feel and so have no right or wrong answers. First I'll hand out the answer sheets and then I'll tell you more about the questions.

Write your name at the top of the first page, both your first and your last names. Also write a B if you're a boy or a G if you're a girl.

As I said before, I am going to ask you some questions. No one but myself will see your answers to these questions--not your teacher or your principal or your parents. These questions are different from other questions that you are asked in school. These questions are different because there are no right or wrong answers. You are to listen to each question and then put a circle around either "yes" or "no." These questions are about how you think and feel and, therefore, they have no right or wrong answers. People think and feel differently. The person sitting next to you might put a circle around "yes" and you may put a circle around "no." For example, if I asked you this question: "Do you like to play ball?", some of you would put a circle around "yes" and some of you would put it around "no." Your answer depends on how you think and feel. These questions are about how you think and feel about school and about a lot of other things. Remember, listen carefully to each question and answer it "yes" or "no" by deciding how you think and feel. If you don't understand a question, ask me about it.

Now let's start by everybody putting their finger on Number 1. Here is the first question. Number 1...

1. Do you worry when the teacher says that she is going to ask you questions to find how much you know?

2. Do you worry about being promoted, that is, passing from the _____ to the _____ grade at the end of the year?

3. When the teacher asks you to get up in front of the class and read aloud, are you afraid that you are going to make some bad mistakes?
4. When the teacher says that she is going to call upon some boys and girls in the class to do arithmetic problems, do you hope that she will call upon someone else and not on you?

5. Do you sometimes dream at night that you are in school and cannot answer the teacher's questions?

6. When the teacher says that she is going to find out how much you have learned, does your heart begin to beat faster?

7. When the teacher is teaching you about arithmetic, do you feel that other children in the class understand her better than you?

8. When you are in bed at night, do you sometimes worry about how you are going to do in class the next day?

9. When the teacher asks you to write on the blackboard in front of the class, does the hand you write with sometimes shake a little?

10. When the teacher is teaching you about reading, do you feel that other children in the class understand her better than you?

11. Do you think you worry more about school than other children?

12. When you are at home and you are thinking about your arithmetic lesson for the next day, do you become afraid that you will get the answers wrong when the teacher calls upon you?

13. If you are sick and miss school, do you worry that you will do more poorly in your schoolwork than other children when you return to school?

14. Do you sometimes dream at night that other boys and girls in the class can do things you cannot do?

15. When you are home and you are thinking about your reading lesson for the next day, do you worry that you will do poorly on the lesson?

16. When the teacher says that she is going to find out how much you have learned, do you get a funny feeling in your stomach?

17. If you did very poorly when the teacher called on you, would you probably feel like crying even though you would try not to cry?
18. Do you sometimes dream at night that the teacher is angry because you do not know your lessons?

The examiner then makes the following statement before continuing:

In the following questions, the word "test" is used. What I mean by "test" is any time the teacher asks you to do something to find out how much you know or how much you have learned. It could be by your writing on paper, or by your speaking aloud, or by your writing on the blackboard. Do you understand what I mean by "test?" It is any time the teacher asks you to do something to find out how much you know.

19. Are you afraid of school tests?

20. Do you worry a lot before you take a test?

21. Do you worry a lot while you are taking a test?

22. After you have taken a test, do you worry about how well you did on the test?

23. Do you sometimes dream at night that you did poorly on a test you had in school that day?

24. When you are taking a test, does the hand you write with shake a little?

25. When the teacher says that she is going to give the class a test, do you become afraid that you will do poorly?

26. When you are taking a hard test, do you forget some things you knew very well before you started taking the test?

27. Do you wish a lot of times that you didn't worry so much about tests?

28. When the teacher says that she is going to give the class a test, do you get nervous or funny feeling?

29. While you are taking a test, do you usually think you are doing poorly?

30. While you are on your way to school, do you sometimes worry that the teacher may give the class a test?
### APPENDIX B

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APPENDIX C

long awful bad great red small good hard blue pretty nice big

peace
poison
love
purpose
success
pleasure
cat
tongue
need
doctor
river
book
great good hard red small awful pretty blue long bad big nice

peace
poison
love
purpose
success
pleasure
cat
tongue
need
doctor
river
book
pretty awful nice good great bad hard red big blue long small

peace    
poison    
love      
purpose   
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pleasure  
cat       
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doctor    
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