A COMPARATIVE STUDY OF ANXIETY
BETWEEN SCIENCE AND ART MAJORS

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A COMPARATIVE STUDY OF ANXIETY BETWEEN SCIENCE AND ART MAJORS

THESIS

Presented to the Graduate Council of the North Texas State College in Partial Fulfillment of the Requirements

For the Degree of

MASTER OF SCIENCE

By

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CHAPTER I

INTRODUCTION

Theories on Anxiety

I would say that learning to know anxiety is an adventure which every man has to affront if he would not go to perdition either by not having known anxiety or by sinking under it. He therefore who has learned rightly to be anxious has learned the most important thing (3, p. 89).

"Every alert citizen of our society realizes, on the basis of his own experiences as well as his observation of his fellow men, that anxiety is a pervasive and profound phenomenon in the middle of the twentieth century (4, p. 3)." It is perceived in many different forms and degrees. Everyone feels the anxiousness of external situations on their lives, such as the threats of war, the demolition of uncontrolled atomic bombs, and radical political gambles; but more specific and more personal are the sources of anxiety within ourselves. How we meet and handle this anxiety will determine to a large degree our success in meeting all of life's problems as well as its opportunities.

Anxiety-creating situations can be constructive when an individual moves "through" anxiety-creating experiences rather than moving them or retreating from them. "Not to be afraid of dangers which could lead to anxiety--this represents
in itself a successful way of coping with anxiety. . . ." (2, p. 303). If an individual thinks of meeting anxiety in a positive, subjective manner, where he is willing to meet it directly, it can be said that there is more value to be achieved in confronting the anxiety-producing situation than in fleeing from it. May (4, p. 229) very explicitly says, "A person is subjectively prepared to confront unavoidable anxiety constructively when he is convinced (consciously or unconsciously) that the values to be gained in moving ahead are greater than those to be gained by escape."

May (4, pp. 112-113) points out that Freud was the first in the scientific tradition to see the fundamental significance of the problem of anxiety. To study Freud on anxiety is to become aware that his thinking on the topic was in process of evolution throughout his life. His theories of anxiety underwent many minor changes as well as one revolutionary change.

Freud's first theory states that when libido is repressed, it becomes transformed into anxiety, and then reappears as free-floating anxiety or as an anxiety-equivalent. "Anxiety is thus general current coin for which all the effects are exchanged, or can be exchanged, when the corresponding ideational content is under repression" (1, p. 350).

May (4, p. 117) explains that Freud's first endeavor to formulate a theory of anxiety is based initially on
observable clinical phenomena. On later analysis of patients with phobias and other anxiety symptoms, Freud found that a quite different process with respect to anxiety was occurring. A new theory was made necessary, too, by his increasing emphasis on the role of the ego, which had played only an auxiliary point in the first theory. May (4, p. 119) goes on to say, "Freud states that the capacity for anxiety is innate in the organism, that it is part of the self-preservation instinct, and that it is phylogenetically inherited." Specific anxieties, however, are taught.

May (4, pp. 139-147) points out that Horney holds that impulses and desires do not become "drives" except as they are motivated by anxiety. "Compulsive drives aim primarily not at satisfaction but at safety; their compulsive character is due to the anxiety lurking behind them."

He explains that Horney places a great deal of emphasis on the reciprocal relation of hostility and anxiety. Horney believes that by far the most common intro-psychic factor provoking anxiety is hostility. Anxiety generates hostility, and hostility impulses in the anxious person generate new anxiety.

May further believes that the exceedingly valuable contribution of Horney to anxiety theory lies in her elucidation of the conflicting trends in personality as the sources of neurotic anxiety and in her placing of the problem of
anxiety squarely on social aspects, in contrast to Freud's tendencies toward quasi-physiochemical forms of thinking.

Basic for Sullivan's theory of anxiety is his concept of personality as essentially an interpersonal phenomenon, developing out of the relations of the infant with the significant persons in his environment.

He also explains that anxiety, to Sullivan, arises out of the infant's apprehension of the disapproval of the significant persons in his interpersonal world. Anxiety is felt empathically in a sensing of the mother's disapprobation long before conscious awareness is possible for the infant.

Anxiety serves to restrain the infant, to restrict his development to those activities of which the significant other persons approve. Sullivan presents the highly important idea that the self is formed out of the growing infant's necessity to deal with anxiety-creating experiences.

Purpose of the Study

The purpose of this study is to determine the levels of anxiety in college freshmen and seniors from the Departments of Science and Art at North Texas State College by using the Taylor Manifest Anxiety Scale (7, pp. 235-290). It is hoped that the findings uncovered by this study will be of help to others interested in investigating and exploring this area.
Background and Significance of the Problem

Very few studies have been done in the area of anxiety. Mowrer remarks, "There is at present no experimental psychology of anxiety, and one may doubt whether there ever will be" (5, p. 89).

May (4, pp. 100-101) points out that "not only is it true that the problem of human anxiety has been absent from the strictly experimental specialties of psychology, but it has largely been omitted from the other branches of academic and theoretical psychology as well." Although not many studies have been done in this area, there seems to be a growing interest in the subject, especially within the last ten years.

In studying anxiety, it becomes clear that the subject may be approached from many different sides. This is explicitly verified by the fact that nearly every well-known author in the fields of psychology, psychiatry, biology, and theology has presented his or her definition of anxiety.

There is what we think of as normal anxiety, in that it does not interfere with normal functioning of the organism in everyday activities. We may also discuss anxiety in relation to neurosis, where the anxiety is a primary factor which prevents the individual from making a healthy adjustment within himself and his environment. Then, there is anxiety that can be thought of in relation to creativity.
Goldstein (2, p. 113) quotes with approval Kierkegaard's statement, "The more original or creative a human being is, the deeper is his anxiety." Rank (7, p. 175) said, "Anxiety occurs when a person apprehends creative capacities within himself, the actualization of these capacities means creating new constellations, as in the case of the artist." May (5, p. 56) maintains "the creative person who ventures into many situations which expose him to shock is more often threatened by anxiety. . . ."

Assumptions and Hypotheses

It would appear from the preceding discussion that the individual as he becomes more creative will experience greater degrees of anxiety. Since artists are considered to be creative individuals, while scientists are thought to be analytically inclined, it is the purpose of this study to test the validity of this assumption. Based on the preceding discussion and for the purpose of this study, it is assumed:

1. That the more subjective the creativity in the individual, the greater will be his anxiety.

2. That science majors are involved in studying techniques and methods which minimize subjective expression of creativity.

3. That creativity of a subjective nature is significantly greater in art majors than in science majors in undergraduate school.
The study is planned to test the following hypotheses:

1. That in new situations and surroundings individuals tend to be more anxious in general than they are in surroundings or situations with which they are familiar. Therefore, senior students will be less anxious than freshmen students because they are more familiar with the college's program, its surroundings, and its expectations of the individual.

2. That there is very little difference in the anxiety of freshmen art majors and freshmen science majors.

3. That there is a significantly higher level of anxiety in senior art students as compared with senior science students.

4. That senior art majors are significantly more anxious in general than are freshmen art majors because of more subjective creativity.
CHAPTER BIBLIOGRAPHY


CHAPTER II

RELATED RESEARCH

Although the concept of creativity has been associated with levels of anxiety, as was discussed in Chapter I, the question arises—why has there been so little empirical research done in this area? It can be said that psychologists have seriously neglected the study of the creative aspects of the personality. The commonly accepted measures of intelligence appear to have been of little help in identifying creative persons. The need for research on creativity and methods of selection of creative persons has been widely recognized and discussed (1, 2, 3, 4). Guilford (11) states that less than two tenths of 1 per cent of the books and articles indexed in the Psychological Abstracts for approximately the past quarter century bear directly on the subject of creativity.

Taylor (17) constructed the Manifest Anxiety Scale for use in a study of eyelid conditioning. The scale consisted originally of items drawn from MAPI. After statistical analysis, the original sixty-five-item scale was reduced to the fifty most discriminating statements. These items are given under the title of Biographical Inventory.
Faber (7) has pointed out, concerning the Manifest Anxiety Scale, that its construction was not aimed at developing a clinically useful test which would diagnose anxiety, but rather was designed solely to select subjects differing in general drive level. The use of the MAS to select groups that are postulated to differ in drive level in an experimental situation has rested on the assumption that scores on the scale are in some manner related to emotional responsiveness which, in turn, contributes to drive level.

Taylor (18) explains that two alternative hypotheses have been entertained concerning the difference between subjects scoring high and low on the MAS with respect to anxiety, "that such groups have different levels of chronic anxiety or that the groups instead differ in their emotional reactivity to anxiety, evoking stimuli present in a situation."

Hoyt and Magoon (12), in a study to validate the Taylor Manifest Anxiety Scale, found highly reliable differences between scores made by clients when judged by counselor ratings and those judged by the MAS. It was also found that there were no differences between the counselors when the variances and means of the ratings were compared.

Generally speaking, no Rorschach patterns uniquely characteristic of artists have been discovered, but artists do appear to have certain traits in common. Roe (15) found that successful artists as a group are above average in
intelligence; Prados (14) concluded that they are very sen-
sitive and emotionally responsive to the outer world but are
unable to adapt to it.

Psychoanalytic writers have attempted to formulate gen-
eral theories concerning the creative personality. Freud (9)
considered the artist to be a person who turns away from
reality and centers all his interests and libido on the cre-
ation of a fantasy life. Hans Sachs sees artists primarily
as "sons in protest against their fathers" (16, p. 52). They
struggle with intense guilt feelings and their feelings moti-
vate their artistic productions. The artist, according to
Fenichel, is an introvert who withdraws from reality into his
fantasies, "which represent derivations of his oedipus wishes
about which he feels guilty" (3, p. 493).

According to Gianascol (10), one's esthetic experience
is heightened by familiarity with a work of art. He states
that both artist and scientist are concerned with theoretic
formal relationships rather than fantasy and wish fulfillment.

Munsterberg and Mussen (13) completed a study designed
to check seven specific hypotheses derived from analytic
writings and from empirical studies related to artists.
Thirty outstanding art students at the Ohio State University
served as subjects. The findings showed that more artists
than nonartists have quiet, introverted personalities and
suffer from intense guilt feelings. Also, in order to be
able to work and to produce works of art, artists seem willing to sacrifice material pleasures, personal success, and personal acceptance.

Dreldahl and Cattell (6) studied personality characteristics of eminent artists and writers by means of Cattell's 16 P F test. The 153 subjects were active and productive artists and writers well known in their fields. The most obvious findings of the study were that the creative person differs from the non-creative person or average person in regard to a great number of personality characteristics, and not all or perhaps even most of these are in what might be considered by some as desirable deviation. They go on to say that artists, being more bohemian and less intelligent than writers, are more dependent upon emotional expression than upon intelligence.

Dreldahl (5) in another study explored some of the possible relationships between ratings of creativity in a high level population and certain objectively measured personality and intellectual factors. The subjects used in the study were graduate or advanced undergraduate students from several of the science and art departments of the University of Nebraska. The raters were faculty members of the University of Nebraska experienced in the task of evaluating the creative abilities of their students. The results of this study suggest the following conclusions (5, pp. 23-26):
1. Creative persons appear to be superior to non-creative persons in their verbal facility, fluency, flexibility, and in their originality.

2. Creative persons appear to be considerably more withdrawn and quiescent than noncreative persons. Creative artists were somewhat more radical and self-sufficient than creative scientists or non-creative persons in either the sciences or the arts.

3. Apart from its classification as creative or non-creative, the art group was more sensitive emotionally, and more bohemian.

4. Individuality or nonconformity appears to be desirable for creativity.

Guilford (II, p. 444) in discussing creativity says that "the creative personality is a matter of those patterns of traits that are characteristic of creative persons."

A creative pattern is manifest in creative behavior which includes such activities as inventing, designing, composing, and planning. He goes on to say that a practical criterion of creativity is difficult to establish because "creative acts of an unquestioned order of excellence are extremely rare" (II, p. 447).
CHAPTER BIBLIOGRAPHY


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CHAPTER III

METHODOLOGY AND PROCEDURE

Introduction

This study, as stated in Chapter I, was designed for the purpose of determining the degrees of anxiety as related to freshmen and senior students in the Departments of Art and Mathematics in order to test the hypothesis that the more subjectively creative the individual becomes, the more anxious he becomes. To determine this factor, the Taylor Manifest Anxiety Scale was given to students of these two departments. Subjects were asked to fill out the Scale by circling the true-false questions in relation to how they applied to them.

Subjects

The subjects for this study consisted of students from the Departments of Art and Mathematics at North Texas State College in Denton, Texas, a North Texas college town with a population of approximately thirty thousand. One hundred men and women students were selected at random from freshmen and seniors enrolled in these two departments. The age range was approximately eighteen to twenty-three years.
Gathering Data

The pertinent data were gathered by means of the Taylor Manifest Anxiety Scale, which the students were asked to fill out by circling the answer best relating to them. They were also asked to give their age, sex, date on taking the scale, and classification; they were instructed not to sign their names. It was felt that the students would be more honest in answering the questions if they did not have to give their names. They were told that the scale was given in order to obtain a biographical inventory of the individual. In order to administer the scale, teachers from the Departments of Mathematics and Art were asked to give the scale to their students who were freshmen and seniors. The teachers were instructed to read the following directions for the scale:

This is a Biographical Inventory. There are no right or wrong answers. Fill in the date, your sex, classification, and age at the top of the page, omitting your name. There are fifty true-false questions. Circle the answer on each question which you think is most characteristic of you. Complete honesty is of utmost importance.

The questionnaire was administered at the beginning of the period.

Classifying Data

From the freshmen population two groups, one from the Mathematics Department and one from the Art Department, were
selected at random. The students from the Art Department consisted of ten males and fifteen females. Those from the Mathematics Department consisted of seventeen male and eight female subjects. From the senior population, two groups were also selected, one from the Mathematics Department and one from the Art Department. Those students from the Art Department consisted of nine males and sixteen females. Those from the Mathematics Department consisted of nineteen males and six females. In order to prepare the raw data for purposes of statistical manipulation, four classifications were made. The data obtained from the two freshmen populations were compiled to test the hypotheses that there is little difference in anxiety between freshmen students from the Departments of Art and Mathematics. The data obtained from the two senior groups were compiled to test the hypothesis that there is significant difference in degree of anxiety in senior art majors and senior science majors. The data were compiled to test the differences between freshmen and seniors from the Department of Art.

Statistical Method

For purpose of statistical analysis, each of the four hypotheses was tested with the following Fisher’s $t$ formula for unrelated groups on mean and standard deviation of anxiety:

\[ \frac{M_1 - M_2}{\sqrt{\frac{S_1^2 + S_2^2}{N-1}}} \]

The first hypothesis measured the level of anxiety between the freshman sample and the senior sample of the science majors. The data in Table I were tabulated to test the hypothesis that senior science majors have less anxiety than freshmen science majors. The last three hypotheses utilized Table I and the Fisher's \( t \) formula to measure the level of anxiety between freshmen art majors and freshmen science majors, between senior science majors and senior art majors, and between senior artists and freshmen artists.
TABLE I

RAW SCORES MADE ON THE TAYLOR MANIFEST ANXIETY SCALE
BY THE FRESHMEN AND SENIOR MATHEMATICS MAJORS
AND THE FRESHMEN AND SENIOR ART MAJORS

<table>
<thead>
<tr>
<th>Freshmen Math Majors</th>
<th>Senior Math Majors</th>
<th>Freshmen Art Majors</th>
<th>Senior Art Majors</th>
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<tbody>
<tr>
<td>32</td>
<td>35</td>
<td>34</td>
<td>37</td>
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<td>4</td>
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CHAPTER IV

STATISTICAL ANALYSIS AND SUMMARY OF FINDINGS

The results of statistical analysis are found in the following tables. In Table II, choices of the four groups from the total population, as computed from Table I, were compared to determine whether or not there was any significance in degrees of anxiety between the four groups tested.

TABLE II
FISHER’S t RATIOS AS RESULTS OF STATISTICAL MANIPULATION OF DATA IN TABLE I

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Group</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Degrees of Freedom</th>
<th>t</th>
<th>P</th>
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</thead>
<tbody>
<tr>
<td>Senior and Freshmen Science Majors</td>
<td>Seniors</td>
<td>14.60</td>
<td>7.102</td>
<td>48</td>
<td>1.773</td>
<td>.10</td>
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<tr>
<td></td>
<td>Freshmen</td>
<td>17.92</td>
<td>6.631</td>
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</tr>
<tr>
<td>Freshmen Mathematicians and Art Majors</td>
<td>Mathematics Majors</td>
<td>17.92</td>
<td>5.809</td>
<td>48</td>
<td>1.093</td>
<td>...</td>
</tr>
<tr>
<td>Freshmen Artists</td>
<td>Art Majors</td>
<td>20.00</td>
<td>8.571</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Senior Mathematicians and Senior Artists</td>
<td>Mathematicians</td>
<td>14.60</td>
<td>7.102</td>
<td>48</td>
<td>1.939</td>
<td>.06</td>
</tr>
<tr>
<td></td>
<td>Artists</td>
<td>19.12</td>
<td>8.571</td>
<td></td>
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<tr>
<td>Senior and Freshmen Artists</td>
<td>Seniors</td>
<td>19.12</td>
<td>8.571</td>
<td>48</td>
<td>.383</td>
<td>...</td>
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<tr>
<td></td>
<td>Freshmen</td>
<td>20.00</td>
<td>7.291</td>
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</tbody>
</table>
The results of statistical manipulation yielded a Fisher's $t$ ratio of 1.733 when levels of anxiety were compared from the senior and freshman population for mathematics majors, indicating .10 level of significant difference in anxiety between seniors and freshmen in this field of study. This hypothesis was rejected. When the level of anxiety was compared between freshmen mathematics and art majors, a Fisher's $t$ ratio of 1.903 indicated a difference in the two groups at less than the 5 per cent level of confidence, causing us to accept the hypothesis of no difference between these two groups in their level of anxiety. The results of statistical manipulation yielded a Fisher's $t$ ratio of 1.939 when anxiety levels were compared between senior mathematics majors and senior art majors. This difference was significant at the .06 level, being very close to the .05 level of significance; however, the null hypothesis was not rejected. When comparing anxiety between senior and freshmen art majors, the results of statistical manipulation yielded a Fisher's $t$ ratio of .383, showing practically no difference in anxiety between the two groups. The null hypothesis was not rejected.

Although there was no significant difference better than the .05 level of confidence of anxiety between senior and freshmen science majors, there was sufficient difference between the two groups to suggest a trend in the direction of less anxiety in senior science majors. The results came
out as expected with the two freshmen groups, showing very little difference in their level of anxiety. Although the difference in anxiety between senior artists and senior scientists was not great enough to reject the null hypothesis, the results of .06 level of confidence strongly suggest that senior artists have significantly more anxiety than senior scientists. It was entirely unexpected to find that there was practically no difference in the level of anxiety between freshmen and senior artists. This would seem to suggest that the Taylor Manifest Anxiety Scale is an inadequate measure for testing subjective creativity.
CHAPTER V

SUMMARY

The purpose of this study was to examine the levels of anxiety in college freshmen and seniors from the Departments of Science and Art at North Texas State College in Denton, Texas. Fifty men and women from each of the two departments were selected at random; in each department twenty-five subjects were selected from freshmen students and twenty-five from senior students.

The Taylor Manifest Anxiety Scale was used to test the following hypotheses:

1. That in new situations and surroundings individuals tend to be more anxious in general than they are in surroundings or situations with which they are familiar. Therefore, senior students will be less anxious than freshmen students because they are more familiar with the college's program, its surroundings, and its expectations of the individual.

2. That there is very little difference in the anxiety of freshmen art majors and freshmen science majors.

3. That there is a significantly higher level of anxiety in senior art students as compared with senior science students.
4. That senior art majors are significantly more anxious in general than are freshmen art majors because of more subjective creativity.

It was found that the difference in the level of anxiety between senior and freshmen mathematics majors did not differ significantly but suggested a trend in the direction of less anxiety in senior mathematics majors. The results of no difference in anxiety between the two freshmen groups came out as expected. The difference in anxiety between the two senior groups was not great enough to reject the null hypothesis. In addition, it was found that there was practically no difference in anxiety between freshmen and senior art majors, suggesting that the level of anxiety as described by the Taylor Manifest Anxiety Scale has no direct relationship to increasing creativity. The results were not consistent with several theories which state that, the more creative a person is, the more anxiety he will have.

Conclusions

The data obtained from this study appear to warrant the following conclusions:

1. Art majors have more anxiety than science majors at North Texas State College.

2. The anxiety of art majors is relatively constant between freshmen and seniors.
3. Anxiety in freshmen science majors is greater than that found in senior science majors.

4. Some other approach must be tried before an accurate assessment of anxiety as related to creativity can be made.
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