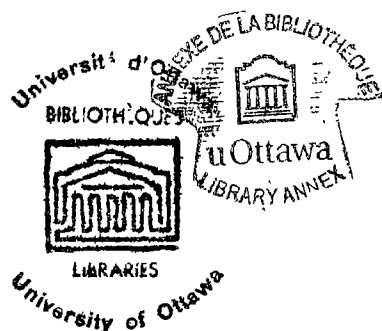


001105  
CSP-2

THE ACHIEVER PERSONALITY SCALE IN RELATION  
TO ANXIETY AND ITS SUB-FACTORS

by Joseph Louis Rizzo

Thesis presented to the Faculty of  
Psychology and Education of the  
University of Ottawa as partial  
fulfillment of the requirements  
for the degree of Master of Arts



Ottawa, Canada, 1966

UMI Number: EC55434

### INFORMATION TO USERS

The quality of this reproduction is dependent upon the quality of the copy submitted. Broken or indistinct print, colored or poor quality illustrations and photographs, print bleed-through, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

**UMI<sup>®</sup>**

---

UMI Microform EC55434  
Copyright 2011 by ProQuest LLC  
All rights reserved. This microform edition is protected against  
unauthorized copying under Title 17, United States Code.

---

ProQuest LLC  
789 East Eisenhower Parkway  
P.O. Box 1346  
Ann Arbor, MI 48106-1346

## ACKNOWLEDGMENTS

This thesis was prepared under the supervision of Raymond Vaillancourt, Ph.D., of the Faculty of Psychology and Education of the University of Ottawa.

The writer is also indebted to W. Raymond Mann, Ph.D., for his help in the sampling, testing, and scoring of the materials used for this study.

## CURRICULUM STUDIORUM

Joseph Louis Rizzo was born April 18, 1941, in Erie, Pennsylvania. He received the Bachelor of Science degree in Physics from Canisius College, Buffalo, New York, in 1963.

## TABLE OF CONTENTS

| Chapter                                                                                                   | page |
|-----------------------------------------------------------------------------------------------------------|------|
| INTRODUCTION. . . . .                                                                                     | vi   |
| I.- REVIEW OF THE LITERATURE. . . . .                                                                     | 1    |
| 1. The Achiever Personality Scale                                                                         | 1    |
| 2. Cattell's Conception of Anxiety                                                                        | 6    |
| 3. Anxiety and Learning Experiments                                                                       | 10   |
| 4. Anxiety and Scholastic Learning                                                                        | 12   |
| 5. Primary Factors of Anxiety and Scholastic Learning                                                     | 16   |
| 6. General Hypotheses                                                                                     | 18   |
| II.- EXPERIMENTAL DESIGN . . . . .                                                                        | 19   |
| 1. The Tools                                                                                              | 19   |
| 2. Testing the Sample                                                                                     | 31   |
| 3. Specific Experimental Hypotheses                                                                       | 34   |
| 4. Statistical Procedures                                                                                 | 35   |
| III.- PRESENTATION AND DISCUSSION OF RESULTS. . . . .                                                     | 38   |
| 1. Preliminary Considerations                                                                             | 39   |
| 2. Anxiety Versus the Achiever Personality Scale                                                          | 46   |
| 3. Anxiety Primaries Versus the Achiever Personality Scale                                                | 52   |
| 4. Suggestions for Further Research                                                                       | 62   |
| SUMMARY AND CONCLUSIONS . . . . .                                                                         | 65   |
| BIBLIOGRAPHY. . . . .                                                                                     | 67   |
| <br>Appendix                                                                                              |      |
| 1. <u>ABSTRACT OF The Achiever Personality Scale in Relation to Anxiety and its Sub-Factors</u> . . . . . | 70   |

## LIST OF TABLES

| Table                                                                                                                                                                                                      | page |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| I.- Reliability Coefficients for the Second-Order Anxiety Factor and Its Primary Components for Forms A and B of the <u>16PF</u> . . . . .                                                                 | 40   |
| II.- Frequency Distributions and Chi Squares for Achiever Personality Scale Scores for Two Different Class Intervals. . . . .                                                                              | 43   |
| III.- Frequency Distributions and Chi Squares for the Second-Order Anxiety Factor Scores for Two Different Class Intervals. . . . .                                                                        | 44   |
| IV.- Correlation Coefficients between the Scores of the Achiever Personality Scale and the Second-Order Anxiety Factor and Its Primary Components for Forms A and B, Combined of the <u>16PF</u> . . . . . | 47   |
| V.- Analysis of Variance of Achiever Personality Scale Scores for Five Groups of Different Levels of the Second-Order Anxiety Factor of the <u>16PF</u> , Forms A and B Combined . . . . .                 | 50   |
| VI.- Analysis of Variance of Achiever Personality Scale Scores for Five Groups of Different Levels of Factor C (Ego Strength) of the <u>16PF</u> , Forms A and B Combined. . . . .                         | 54   |
| VII.- Analysis of Variance of Achiever Personality Scale Scores for Five Groups of Different Levels of Factor O (Guilt Proneness) of the <u>16PF</u> , Forms A and B Combined . . . . .                    | 55   |
| VIII.- Analysis of Variance of Achiever Personality Scale Scores for Five Groups of Different Levels of Factor Q <sub>4</sub> (Ergic Tension) of the <u>16PF</u> , Forms A and B Combined . . . . .        | 56   |

## INTRODUCTION

With the tremendous growth of university enrollments student selection has become a major problem. Whether or not a student would make satisfactory progress in college has been traditionally judged by means of previous grades and/or scores on intelligence, aptitude, and achievement tests. Although these measures have been very useful to administrators in the prediction of academic success, generally, these measures are only able to account for a small proportion of the total variance available. (Many test users are able to surpass this general limit by allowing for and adjusting to certain local academic conditions.) As a result of this inadequate approach to academic prediction a great number of investigators have turned to the realm of personality to try to offer a significant improvement in the amount of prediction. The areas of self-concept, anxiety, conformity, and neuroticism have been some of the areas most often considered in relation to academic achievement in contemporary research.

Many personality scales have been unsuccessful in yielding any appreciable improvement in predictive efficiency when they were taken together with the traditional measures. This may be due to many factors related primarily to the construction and cross-validation of the scales themselves.

Fricke has succeeded in improving the accuracy of academic predictions over the usual measures by using his Achiever Personality Scale. This empirically constructed scale

purports to measure aspects of personality related to initial college grades. Basically Fricke analyzed the test items and studied their intercorrelations and their correlations with college marks. From these he selected a group of items which correlated with college achievement, but not with intelligence, academic aptitude scores, or high school marks or class standings. Although this scale results in better academic prediction, the features of personality which it measures are not clearly identified. Despite the fact that it is helpful in student selection, nevertheless this scale is of very limited use in counselling because of its indeterminate nature. Accordingly, in an attempt to identify the nature of the personality variables operating in Fricke's instrument, his scale will be studied in relation to a rather basic personality variable, anxiety.

It was decided to analyze the Achiever Personality Scale with respect to anxiety for several reasons. First, anxiety seems fundamental in personality and as such is important in its own right. Secondly, anxiety is one of the most extensively used variables in the area of personality and academic achievement.

Although anxiety has long been of central interest to psychologists involved in investigations in the area of personality, the many diverse approaches with respect to it have given rise to much confusion. Cattell feels that much of this

confusion is due to the readiness of empiricists to represent anxiety by any measure without any attempt at finer distinction or conceptual clarity. In addition, semantic difficulties result from writers equating anxiety with a great variety of phenomena. Reger has analyzed 1355 articles on anxiety and found that anxiety was defined in at least sixty different ways. Research by Cattell and Scheier has shown that most attempts to associate anxiety with rather arbitrary experimental measures have usually led to contradictory conclusions.

Cattell has tried to reduce confusion with respect to anxiety by means of systematic and rigorous experimentation which was chiefly factor analytic. For this reason, Cattell's conception of anxiety will be followed and used to analyze Fricke's scale.

The first chapter reviews the Achiever Personality Scale in relation to the academic prediction of grades in college. Then the literature on anxiety and its sub-factors is presented as constituting fundamental personality variables which might be related to Fricke's scale.

The formulation of the general hypotheses is followed by a description of the experimental design of the study. This exposition emphasizes the characteristics of the male college freshmen sample as well as the tools, techniques, and procedures used in the investigation.

In the final chapter the results obtained in the statistical analysis are presented and discussed. Explanations for the results are offered and the implications for further research are indicated.

## CHAPTER I

### REVIEW OF THE LITERATURE

This chapter describes Fricke's Opinion, Attitude and Interest Survey(OAIS)<sup>1</sup> and presents information about the Achiever Personality Scale as a predictive measure of academic success. Next it concerns itself with Cattell's conception of anxiety. Then the nature of anxiety and its implications for the present study is discussed in the light of laboratory and classroom learning studies. Finally, the hypothesis for the present study, which deals with the possibility that Fricke's Achiever Personality Scale is factorially complex and partially composed of anxiety and/or its primary factors, is stated.

#### 1. The Achiever Personality Scale.

Recently Fricke has developed a personality measure which has been shown to significantly improve academic prediction when several of the traditional measures are also employed. This scale, the Achiever Personality Scale is only one scale of Fricke's OAIS. The OAIS is an inventory used in college<sup>2</sup>

---

1 Benno G. Fricke, Opinion, Attitude and Interest Survey, Ann Arbor, Michigan, Evaluation and Examinations Division, Bureau of Psychological Services, University of Michigan, 1955.

2 -----, Opinion, Attitude and Interest Survey Handbook: A Guide to Personality and Interest Measurement, Ann Arbor, Michigan, University of Michigan, 1963, p. 1.

and high school guidance programs to help improve selection and in counselling about performance of freshmen students in liberal arts programs. It functions by contributing information above and beyond that provided by the ordinary measures. It contains scales which concern themselves with general areas of academic promise, psychological adjustment, and educational-vocational interests. It has been available for a brief time and many people in the field are interested in what it does, how it does it, and the degree to which it is successful. Interest in this instrument is currently so high as to warrant the presentation of a symposium on the OAIS at the 1964 APA convention.<sup>3</sup>

Fricke was primarily interested in empirically constructing a scale which would be able to predict academic grades and consequently help in selection in a way which would increase the total amount of predictability when it was combined with the usual measures, while statistically being unrelated to them. To achieve this basic purpose, Fricke assumed that the personalities of students with superior grade records were different from the personalities of students with inferior grade records.<sup>4</sup>

Fricke constructed the scale empirically by analyzing a great number of items and examining their intercorrelations

---

<sup>3</sup> APA Convention, September 6, 1964.

<sup>4</sup> Fricke, Op. Cit., 1963, p. 1.

and correlations with college marks. If items correlated with college marks and were related to intelligence, academic aptitude scores, high school marks, or class standing they were placed in the Intellectual Quality Scale of the OAIS. However, those items predictive of college achievement but unrelated to the intellectual measures just mentioned, were judged to be indicative of personality traits and constituted the Achiever Personality Scale.

Research shows that Fricke has achieved what he set out to do. A recent review<sup>5</sup> of twenty studies carried out at thirteen colleges in the eastern part of the United States, with a total N of 4,400 students, cites a median Pearson r of .36 between Achiever Personality Scale scores and the college grade point average (p .01). It also cites<sup>6</sup> a median Pearson r of .08 between Achiever Personality Scale scores and achievement test scores. Other research<sup>7</sup> shows that when the Achiever Personality Scale score is taken together with achievement test scores and previous high school average, it contributes significantly in predicting college grade point average.

Fricke did not analyze and delimit the aspects of personality which might be involved in his Achiever Personality

---

5 Benno G. Fricke, "The OAIS Test and Testing Program", Newsletter of the Inter-University Committee on the Superior Student, Vol. 7, No. 2, issue of March-April 1965, p. 46-47.

6 Ibid., p. 47-48.

7 Fricke, Op. Cit., 1963, p. 75-85.

Scale before he constructed it. Consequently, his scale is highly empirical and seems to include many factors because of its mode of development and the complexity of the criterion which it is trying to measure. Empirical scales are usually constructed from a large number of items which are found to distinguish statistically between the groups studied. Only when a high number of the items of a scale of this kind are answered in the determined direction can one make a fairly adequate statement about the testee. (Typical well-known empirical scales are the Minnesota Multiphasic Personality Inventory(MMPI) scales and all the scales of the Strong Vocational Interest Blank(SVIB).) For example, a person who answered all of the physician items in the SVIB in the proper manner will be said to have an interest pattern which resembles that of many physicians. Empirical scales are gross things and their meaning can change drastically as scores move from lower ranges to higher ranges because they sample such heterogeneous matter.

On the other hand, scales which are constructed factorially are different because they measure discrete factors which were analyzed beforehand through other research. Each answer in the determined direction on a factor analytic scale contributes an additional increment to a person's total score on that factor. Consequently, what can a counsellor say about a student who did not score highly on the physician items on the

SVIB with respect to his interest in the medical line? A wise counsellor would be very cautious because it is still possible for a student to have a high interest in medicine and still not have it revealed because of the items or overall construction of the scale or many other reasons. The counsellor would need other sources of information before he could be more adequate in his statement. The same principle applies to a low score on the Achiever Personality Scale.

Fricke constructed the Achiever Personality Scale to predict college achievement from a personality basis and consequently to help in selection and further counselling. Granted many institutions have found that it does increase the amount of variance which they can predict, but its action is gross and a low score seems to provide only a mysterious danger signal. If the student doesn't have a high score on it what are you to do? A low score merely tells you that the person has not attained a score which is usually associated with academic success. It does not say where the student's difficulty might be. It is not even possible for the test user to get an idea of what might be happening by doing an item analysis of the student's responses because of the extreme security measures involved in the use of the test, i.e., there are no scoring keys available; all scoring has to be done through contracted computer scoring centers. Hence, the test user doesn't even know which items of the QAIS are used for

the Achiever Personality Scale. What is the test user to do? He is left with a gross indicator which has value but which does not give any specific suggestions when someone obtains a low score on it because its factorial composition is unknown.

The Achiever Personality Scale does improve academic prediction over the traditional measures, but the manner in which it was constructed was purely empirical and consequently the personality characteristics which the scale measures are not specified. Therefore, this study is an attempt to identify some of the personality variables which this scale measures and, hence, to further knowledge about it. By clarifying the nature of the aspects of personality assessed by the scale, its use in academic counselling will also be aided.

## 2. Cattell's Conception of Anxiety.

Anxiety is one of the best known factors in the Cattell theory of personality. This factor has been verified in each of the three measuring media (Life Ratings, Questionnaire, and Objective Tests) by many studies.<sup>8</sup> Although anxiety as clinically evaluated does relate to a primary factor in the realm of Objective Tests, in the Questionnaire and Life Rating

---

<sup>8</sup> Raymond B. Cattell and Ivan Scheier, "The Nature of Anxiety: A Review of Thirteen Multivariate Analyses Comprising 814 Variables", Psychological Reports, Vol. 4, No. 2, issue of June 1958, p. 351-388.

realms, it has been shown to be related to several aspects of some of the primary factors. That is, many aspects of these primary factors have been shown to be related to some aspects of what clinicians call anxiety.<sup>9,10</sup> When the relations of these primary factors are themselves factor analyzed it is found that they are involved in an anxiety factor of a higher order, i.e., a second-order Anxiety factor which is called F(Q)II. This second-order Anxiety factor is more general than the mere primary factors and corresponds more closely to the clinical evaluation of anxiety than they do.<sup>11</sup> In fact, according to its authors:

F(Q)II is the only known questionnaire and life factor which significantly and consistently discriminates between higher and lower anxiety persons as clinically evaluated.<sup>12</sup>

They therefore conclude that, "on both type and trait definition grounds, F(Q)II is the only, or, at least, the major factor to which the clinical concept of anxiety pertains."<sup>13</sup>

Because the second-order Anxiety factor considers several personality dimensions it should be more helpful in

---

<sup>9</sup> Raymond B. Cattell and Ivan H. Scheier, The Meaning and Measurement of Neuroticism and Anxiety, New York, Ronald, 1961, p. 50.

<sup>10</sup> W.H. Holtzman and M.E. Bitterman, "A Factorial Study of Adjustment to Stress", Journal of Abnormal and Social Psychology, Vol. 52, No. 2, issue of March 1956, p. 179-185.

<sup>11</sup> Cattell and Scheier, Op. Cit., 1961, p. 45.

<sup>12</sup> Ibid., p. 54.

<sup>13</sup> Ibid., p. 54.

dealing with the total concept of anxiety. Many researchers tend to deal only with some restricted aspects of anxiety and, hence, are in danger of inadequate determinations. The second-order Anxiety factor, therefore, is seen to be more precise and comprehensive and as a result it will be helpful in experimentation. Also because of its nature it will be able to relate experimental results to personality variables within the total personality.

Because the concept of anxiety is unitary, but requires several primary factors to measure it in the questionnaire realm, it is important to understand them. Cattell lists the components of anxiety as follows:

- i) Ego Strength (C Factor)
- ii) Threectia (H Factor)
- iii) Protension or Suspiciousness (L Factor)
- iv) Guilt Proneness (O Factor)
- v) Will Control (Q<sub>3</sub> Factor)
- vi) Ergic Tension (Q<sub>4</sub> Factor).<sup>14</sup>

The following specific combination of these six factors yields a score for general anxiety:<sup>15</sup>

$$F(Q)II \text{ (General Anxiety)} = 3.74 - .18C - 17H + .30Q \\ + .19L - .20Q_3 + .38Q_4.$$

---

<sup>14</sup> Cattell and Scheier, Op. Cit., 1961, p. 55-56.

<sup>15</sup> Raymond B. Cattell and Herbert W. Eber, Handbook for The Sixteen Personality Factor Questionnaire, Champaign, Illinois, Institute for Personality and Ability Testing, 1962, p. 47.

It should be noted that the particular factors involved in this equation are to be evaluated in terms of the normative groups concerned. Accordingly, this equation will give different results for the various reference groups.

The person scoring low on Factor C (Ego Strength) tends to be "lacking in frustration tolerance, changeable in attitudes, showing general emotionality, evasive on awkward issues and in facing personal decisions, neurotically fatigued, and worrying."<sup>16</sup>

The person scoring low on Factor H (Threctia) tends to be "shy, withdrawn, retiring in the face of the opposite sex, aloof, cold, self-contained, apt to be embittered, restrained, conscientious, restricted interests, careful, considerate and quick to see dangers."

The person scoring high on Factor L (Protension) tends to be "jealous, self-sufficient, suspicious, withdrawn, brooding, tyrannical, hard and irritable."

The person scoring high on Factor O (Guilt Proneness) tends to be "worrying, anxious, depressed, sensitive, tender, easily upset, strong sense of duty, exacting, fussy, hypochondrical, have phobic symptoms, be moody, lonely and brooding."

---

<sup>16</sup> Cattell and Eber, Op. Cit., p. 12-18. This describes factors C, H, L, O, Q<sub>3</sub>, and Q<sub>4</sub>, respectively, as quoted here.

The person scoring low on Factor Q<sub>3</sub> (Will Control) tends to be "uncontrolled, lax and poor self-sentiment formation."

The person scoring high on Factor Q<sub>4</sub> (Ergic Tension) tends to be "tense and excitable."

Combining all of these factors, the second-order Anxiety factor reveals<sup>17</sup> a high libido-type level of undischarged general drive tension (Q<sub>4</sub>+, Ergic Tension), which is not integrated properly in relation to a clearly stabilized self concept (Q<sub>3</sub>-, Will Control). Further, there is a poorly developed weak ego (C-, Ego Strength), with the powerful super-ego development suggested by the guilt proneness and feelings of unworthiness (O+, Guilt Proneness). Less important are the paranoid-like suspicion of L+ (Protension) and the timidity and high threat susceptibility of H- (Threatia).

In order to present a complete picture of anxiety as a personality predictor of college achievement, it is first necessary to discuss briefly anxiety in relation to classical learning.

### 3. Anxiety and Learning Experiments.

In a recent review of twenty-five studies done with the Taylor Manifest Anxiety Scale (MAS) (which is a good measure of the Cattell general anxiety factor)<sup>18</sup> and eyelid

---

17 Cattell and Scheier, Op. Cit., 1961, p. 57.

18 Ibid., p. 442.

conditioning, Spence<sup>19</sup> found that in twenty-one of the twenty-five studies, high anxious subjects learned better than low anxious subjects on a simple learning task. He also reported that low anxious subjects did better than high anxious subjects when learning was more complex.

In experiments done with rate of conditioning of the Galvanic Skin Response (GSR), Cattell and Scheier<sup>20</sup> reported an  $r$  of about .25 between anxiety as measured by the Cattell scale and rate of GSR conditioning. They also found a slight but non-significant correlation when they considered anxiety and the amount of the GSR. Further consideration of GSR conditioning revealed no significant correlation between anxiety and extinction rate.

Although the MAS is highly associated with the Cattell concept of anxiety, Rosenthal<sup>21</sup> has shown that the MAS is also very highly associated with Factor Q<sub>4</sub>. With this in mind, Cattell and Scheier<sup>22</sup> hypothesize that the results of the Spence studies done with the MAS and learning could be ascribed to Factor Q<sub>4</sub> (Ergic Tension) and not to general anxiety.

---

19 Kenneth W. Spence, "Anxiety (Drive) Level and Performance in Eyelid Conditioning", Psychological Bulletin, Vol. 61, No. 2, issue of February 1964, p. 129-139.

20 Cattell and Scheier, Op. Cit., 1961, p. 96.

21 Irene Rosenthal, A Factor Analysis of Anxiety Variables, unpublished doctoral thesis presented to the University of Illinois, 1955, p. 48.

22 Cattell and Scheier, Op. Cit., 1961, p. 96.

Consequently, where Spence found differences in anxiety levels in the learning experiments, it seems possible that in other learning tasks, groups differentiated on the basis of Factor Q<sub>4</sub> (Ergic Tension) might achieve at different levels. Hence, it seems that if groups of students were separated on the basis of their Factor Q<sub>4</sub> scores and compared with respect to their Achiever Personality Scale scores, those with low Q<sub>4</sub> scores might have high Achiever Personality Scale scores. This is a direct parallel with the thinking of Spence where his high anxious subjects did better than the low anxious subjects on simpler tasks but poorer on more complex tasks. Although it is assumed here that college learning is a complex task, there may be much variability for different academic areas.

#### 4. Anxiety and Scholastic Learning.

Cattell and Scheier<sup>23</sup> also say that their anxiety factor might be interpreted as some kind of learning facility. This concept must, however, be greatly restricted because anxiety has no relation to intelligence while having some relation to school achievement and verbal ability.<sup>24</sup> Bendig<sup>25</sup>

---

23 Cattell and Scheier, Op. Cit., 1961, p. 94.

24 Ibid., p. 95.

25 A.W. Bendig, "Manifest Anxiety and Projection and Other Measures of Need Achievement", Journal of Consulting Psychology, Vol. 21, No. 4, issue of August 1957, p. 354.

was brought about a further refinement by his failure to find a relationship between the MAS (which, as previously mentioned, is a good measure of Cattell's general anxiety factor) and Edwards' and McClelland's measures of need achievement. As a result of the above findings, Cattell and Scheier<sup>26</sup> say that anxiety seems to be related to achievement only in a specialized dynamic situation in which insecurity causes concentration on a particular kind of outlet.

In accord with this statement it would follow that any personality trait used to predict an individual student's level of college achievement would not be related to anxiety. In other words, some students may be achieving because of insecurity, but it doesn't seem likely that the majority of students would be achieving because of it. Therefore, if a personality predictor of academic success would be successful in predicting for the majority of cases, it would seem to be measuring something which is true for the majority of students. With this line of logic it is reasoned that the Achiever Personality Scale should not be related to the Cattell anxiety factor because it attempts to predict a level of achievement for each student.

Cattell and Scheier have also constructed<sup>27</sup> a specification equation for scholastic performance, in high school and

---

26 Cattell and Scheier, Op. Cit., 1961, p. 95.

27 Ibid., p. 263.

college, using some of the scales of the Sixteen Personality Factor Questionnaire (16PF). Personal communication with Scheier<sup>28</sup> has revealed that no one study is entirely responsible for it, but rather they modify the equation as data indicates. Most of these studies are unpublished which makes it difficult for the experimenter to use them. This equation is important here because it indicates that low anxiety would seem to be associated with good grades and high anxiety seems to be associated with poor grades.<sup>29</sup>

A study reported by Cattell and Scheier<sup>30</sup> compared 1,128 college undergraduates with the general population with respect to anxiety level. This comparison revealed that the educationally more fortunate and successful persons had slightly lower levels of anxiety. The work of Bendig and Hountras<sup>31</sup> allows this trend to be extended because they found that graduate students in education were not significantly different from undergraduates with respect to their anxiety levels.

---

28 Ivan H. Scheier, Associate Director of the Institute for Personality and Ability Testing, Personal Correspondence with the Author, letter dated November 19, 1964.

29 Cattell and Scheier, Op. Cit., 1961, p. 263.

30 Ibid., p. 264.

31 A.W. Bendig and P.T. Hountras, "Anxiety, Authoritarianism, and Attitude toward Departmental Control College Instruction", Journal of Educational Psychology, Vol. 50, (no number), 1959, p. 1-7.

In attempting to bring some general lines together, Cattell and Scheier<sup>32</sup> say that if any rough trend exists between anxiety and scholastic success it is that low anxiety seems to be associated with it. They emphasize that this is a very rough trend which probably reverses under specific circumstances involving the levels of motivation and difficulty as well as the intensity of the anxiety. This trend is such that a moderate amount of anxiety probably facilitates learning while a very high level probably interferes with it; hence, the relationship is probably curvilinear in nature.

Recent research by Zaynor<sup>33</sup> failed to find a significant linear relationship between anxiety and cumulated average for 277 students in introductory psychology.

As a result of these studies it seems that there is probably no linear relationship (correlation) between anxiety and the Achiever Personality Scale. It further seems that a curvilinear relationship may exist. It also seems that students with low anxiety levels may have higher Achiever Personality Scale scores than students with high anxiety levels.

---

32 Cattell and Scheier, Op. Cit., 1961, p. 264.

33 Jo Ann Zaynor, The Relationship of Selected Intellectual and Nonintellectual Variables to Academic Achievement, unpublished Master's thesis, presented to the University of Hawaii, 1961, p. 41.

### 5. Primary Factors of Anxiety and Scholastic Learning.

The specification equation of Cattell and Scheier<sup>34</sup> is also important because it reveals that the primary factors of anxiety are themselves involved in achievement.

Other studies have been done with these factors and scholastic learning, but the majority of them are unpublished or are private communications to the Institute for Personality and Ability Testing.<sup>35</sup> The following review will be based primarily on the work of Wright<sup>36</sup> because of its applicability, experimental composition, and controls. Wright studied under-achievers, i.e., students who have the intelligence, interest and grasp of the subject, but who when faced with a final examination make grades much lower than those earned during the year. He assumed that the variables involved in underachievement were on a continuum. His groups of achievers and under-achievers were matched on the AGE, Iowa Silent Reading Test, and the Cattell Culture Free Intelligence Test. He found<sup>37</sup> that students with high C factor (Ego Strength) scores were

---

<sup>34</sup> Cattell and Scheier, Op. Cit., 1961, p. 263.

<sup>35</sup> Scheier, Op. Cit., November 19, 1964.

<sup>36</sup> Stuart Wright, Some Psychological and Physiological Characteristics of Certain Academic Underachievers, unpublished doctoral thesis, presented to the University of Chicago, Illinois, 1954, iii-113 p.

<sup>37</sup> Ibid., p. 49.

actually better achievers. Cattell<sup>38</sup> has reported the work of Betz and Scheier, who independently showed that persons high on Factor C also do better on various kinds of endurance tests and even show better physical condition.

Wright also found<sup>39</sup> that low Factor H (Threctia) was associated with scholastic achievement. In line with the work of O'Halloran,<sup>40</sup> Wright found<sup>41</sup> that low Factor Q<sub>1</sub> (Ergic Tension) was associated with scholastic achievement.

Because of the inclusion of the primary factors of anxiety into the Cattell specification equation for grades, it seems that these primary factors may be related to the Achiever Personality Scale. As a result of some of the studies with these primary factors of anxiety which have revealed differential effects of these primary factors with respect to achievement, it seems that there may be differential effects of these primary factors to the Achiever Personality Scale scores.

Accordingly, the present investigation studies the relation of the Achiever Personality Scale to Anxiety and its sub-factors. Anxiety and its sub-factors were operationally

---

38 Raymond B. Cattell, Personality and Motivation Structure and Measurement, Yonkers, World Book, 1957, p. 182.

39 Wright, Op. Cit., p. 49.

40 Ann O'Halloran, An Investigation of Personality Factors Associated with Achievement in Arithmetic and Reading, unpublished Master's thesis presented to Purdue University, Lafayette, Indiana, 1954, (no pages).

41 Wright, Op. Cit., p. 49.

defined in terms of scores on the C-Ego Strength, H-Threctia, L-Protension, O-Guilt Proneness, Q<sub>3</sub>-Will Control, and Q<sub>4</sub>-Ergic Tension factors of the Sixteen Personality Factor Questionnaire.

#### 6. General Hypotheses.

On the basis of the Cattell-Scheier theory, the following hypotheses were deduced:

1. There should be no relationship between Anxiety and the Achiever Personality Scale.
2. There may be significant differences between groups of different levels of Anxiety and their corresponding scores on the Achiever Personality Scale.
3. There may be some relationship between the primary factors of Anxiety (C, H, L, O, Q<sub>3</sub>, and Q<sub>4</sub>) and the Achiever Personality Scale.
4. There may be significant differences between groups of different levels of the primary factors of Anxiety and their corresponding scores on the Achiever Personality Scale.

The following chapter will present systematically those elements and procedures which were used to test these hypotheses.

## CHAPTER II

### EXPERIMENTAL DESIGN

Having reviewed the literature and arrived at general hypotheses, it will be the purpose of this chapter to describe the materials and techniques used to conduct the study to test them.

The instruments used in the study are discussed; the sample is described, and the testing procedures are outlined. The specific experimental hypotheses are listed and the statistical procedures used to test them are set forth.

#### 1. The Tools.

After a general introduction to the Sixteen Personality Factor Questionnaire (16PF),<sup>1</sup> emphasis will be placed on those of its factors which were employed in this study. Although most of the conclusions reached are relative to the 16PF itself they are seen as being applicable to the individual factors of interest to this study. The Achiever Personality Scale of the Opinion, Attitude and Interest Survey (OAIS)<sup>2</sup> will then be discussed.

---

1 R.B. Cattell, D.R. Saunders, and G.F. Stice, The Sixteen Personality Factor Questionnaire, Champaign, Illinois, Institute for Personality and Ability Testing, 1949.

2 Benno G. Fricke, Opinion, Attitude and Interest Survey, Ann Arbor, Michigan, University of Michigan, 1955.

a) The Sixteen Personality Factor Questionnaire.-

The 16PF is a test which, according to its authors,<sup>3</sup> gives the fullest information in the shortest time about most personality traits. While Cattell and Eber<sup>4</sup> lead one to believe that this test covers "all the main dimensions along which people can differ, according to basic factor analytic research", Adcock<sup>5</sup> brings out the point that such established traits as self confidence, autistic tendency, and masculinity-femininity are not covered and he wonders how many others are absent. He feels, however, that the authors have probably covered the most important factors and will probably expand their test to include other traits when it is possible. The sixteen dimensions of personality measured by this test have been substantiated by considerable research<sup>6</sup> as real, functionally unitary, and psychologically significant dimensions having a wide area of influence on behavior. An impressive amount of factor analytic research has been devoted to isolating these dimensions and constructing a questionnaire to measure them.<sup>7</sup>

---

3 Raymond B. Cattell and Herbert Eber, Handbook for the Sixteen Personality Factor Questionnaire, Champaign, Illinois, Institute for Personality and Ability Testing, 1962, p. 1.

4 Ibid., p. 1.

5 C.J. Adcock, "The Sixteen Personality Factor Questionnaire", in O.K. Buros, (ed.), The Fifth Mental Measurements Yearbook, Highland Park, N.J., The Gryphon Press, 1959, p. 198.

6 Cattell and Eber, Op. Cit., p. 2.

7 Ibid., p. 2.

The 16PF is different from most other personality questionnaires because every item used to measure each factor has a demonstrated loading on the factor.<sup>8</sup> The test is merely the questionnaire extension of Cattell's theory of personality which also deals with life ratings and objective test measures.

This questionnaire is being used here for its second-order Anxiety factor and the primary sub-factors of anxiety. Gorsuch and Cattell<sup>9</sup> have verified the existence of the second-order Anxiety factor in the 16PF by re-rotating the raw data of eight independent studies on the 16PF with a total N of 1,652. As a result of this and other studies they<sup>10</sup> affirm it is the "most definitive anxiety measurement", because it is comprehensively based on the total personality sphere while being related to a behavior rating factor and to objective test dimensions. An added advantage in using the 16PF to measure anxiety is that it also provides the experimenter with scores for each of the primary components, whereas several of the other scales available merely supply the experimenter with an overall anxiety score.

---

<sup>8</sup> Cattell and Eber, Op. Cit., p. 2.

<sup>9</sup> Richard L. Gorsuch and Raymond B. Cattell, "Second-Strata Personality Factors Defined in the Questionnaire Medium by the 16PF", in press.

<sup>10</sup> Ibid.

The authors of the 16PF have claimed<sup>11</sup> not to have aimed at artificially high reliabilities, which are sometimes quoted by other handbooks, in the construction of this test. They have, on the other hand, placed more emphasis upon its range and discriminating ability. They report<sup>12</sup> internal consistency coefficients of reliability (split-half which were corrected to full length) for forms A and B combined for a sample of 450 young male adults. The reliability of the factors involved in anxiety ranged from .76 for Q<sub>3</sub> (Will Control) to .93 for C (Ego Strength). They also reported<sup>13</sup> equivalence coefficients for forms A and B for a N of 390. These coefficients were considerably lower and ranged from .41 for L (Protension) to .64 for Q<sub>4</sub> (Ergic Tension). Karson and Pool<sup>14</sup> in their research do not think the r's which they found between forms A and B are high enough for equivalence. Cattell and Eber,<sup>15</sup> however, say that these forms are equivalent only in that they measure the same factors. They further stress that

---

11 Cattell and Eber, Op. Cit., p. 3-4.

12 Ibid., p. 3-4.

13 R.B. Cattell, D.R. Saunders, and G.F. Stice, Tabular Supplement to the Handbook for the Sixteen Personality Factor Questionnaire, Champaign, Illinois, Institute for Personality and Ability Testing, 1957, p. 20.

14 Samuel Karson and Kenneth Bryner Pool, "The Construct Validity of the Sixteen Personality Factors Test", Journal of Clinical Psychology, Vol. 13, No. 3, issue of July 1957, p. 245-251.

15 Cattell and Eber, Op. Cit., p. 3.

a minimum of two of the three forms be used when doing research so that there will be adequate sampling of the factors.

Although the reliabilities of the factors of the 16PF may be a little low (particularly for the equivalence type of reliability), the split-half reliabilities which were corrected to full length for forms A and B combined do not seem to vary much from the reliabilities of other personality inventories.<sup>16,17</sup> The authors seem to be aware of this and this is probably one of the reasons why they stress that at least forms A and B both be used when conducting research. Lorr<sup>18</sup> also feels that because the split-half reliabilities for the single form are so low many scales would be satisfactory only for group prediction if they were used in the single form. The present writer recognized this deficiency and incorporated both forms A and B into the design of this study in order to obtain acceptable reliabilities and adequate sampling of interested factors.

While the reliabilities of the 16PF may be a little low under certain circumstances (like the single scale use)

---

<sup>16</sup> S.R. Hathaway and J.C. McKinley, Manual for the Minnesota Multiphasic Personality Inventory, New York, Psychological Corporation, 1951, p. 7.

<sup>17</sup> A.L. Edwards, Manual for the Edwards Personal Preference Schedule, New York, Psychological Corporation, 1959, p. 19.

<sup>18</sup> Maurice Lorr, "The Sixteen Personality Factor Questionnaire", in O.K. Buros, (ed.), The Sixth Mental Measurements Yearbook, Highland Park, N.J., The Gryphon Press, 1965, p. 368.

they are capable of high validities because they are factorially pure. For a factorially pure test, i.e., a mono-factor test, the intrinsic validity is equal to the square root of its reliability.<sup>19</sup> From this line of reasoning and the split-half reliabilities reported by the authors of the 16PF, the intrinsic validity for these factors involved in anxiety range from .87 for Q<sub>3</sub> (Will Control) to .96 for C (Ego Strength).<sup>20</sup> These validities are purely theoretical, however, and Wittenborn<sup>21</sup> points out that no real "practical" validities are supplied by the authors. This no doubt may be uncomfortable at times until "practical" validities are developed and reported. However, because of the great amount of factor analytic research done in isolating these factors as existing in the questionnaire realm and determining that these questions do load on the appropriate factors, the test user can be confident that this test does measure what it purports to and that its factors are valid. In view of this overall picture Adcock<sup>22</sup> says, "For a multi-dimensional test of this kind one could not hope for much more" and that,<sup>23</sup> "The 16PF test bids

---

19 J.P. Guilford, Psychometric Methods, Second Edition, New York, McGraw-Hill, 1954, p. 399.

20 Cattell and Eber, Op. Cit., p. 4.

21 J. Richard Wittenborn, "The Sixteen Personality Factor Questionnaire", in O.K. Buros, (ed.), The Fourth Mental Measurements Yearbook, Highland Park, N.J., The Gryphon Press, 1953, p. 149.

22 Adcock, Op. Cit., p. 198.

23 Ibid., p. 198.

fair to become the standard questionnaire type test of the future. It provides a comprehensive range of trait scores which should be useful for occupational guidance." In the latest review of the 16PF, Lorr<sup>24</sup> says that "it appears to be the best factor-based personality inventory available."

b) The Achiever Personality Scale.- This scale was employed in this study because it is claimed<sup>25</sup> to be a personality measure of college grade average. Fricke's objective in constructing this scale was to measure those areas of personality which were involved in scholastic success that were not assessed by the traditional measures. This scale is thought to measure some area of personality because its scores while being related to academic grades are related to neither scores of ability nor to intelligence test results.

Fricke's scale was empirically developed<sup>26</sup> on a sample of 10,000 freshmen liberal arts college students. For each student there was a standard score for grade point average and another for ability. The standard score for ability was derived from a combination and transformation of scores from the American Council on Education Psychological Examination (ACE) and either the Cooperative English Vocabulary or the

---

24 Lorr, Op. Cit., p. 368.

25 Benno G. Fricke, Opinion, Attitude and Interest Survey Handbook: A Guide to Personality and Interest Measurement, Ann Arbor, Michigan, University of Michigan, 1963, p. 3.

26 Ibid., p. 75-77.

Ohio State University Psychological Examination. The scores were weighted to give the ACE a weight of two and the verbal measure a weight of one. Discrepancies between this composite ability standard score and the grade point average standard score gave an index of over- or under-achievement and students were grouped into under- or over-achievers. The over-achiever group contained 2,749 students and the under-achiever group contained 2,873 students for a total of 5,622 students. The criteria for accepting a person into either group differed for men and women because the distribution of these discrepancies were different.

Fricke<sup>27</sup> does not report what percentage discrimination he required between the two groups to accept an item into the scale. He merely states that "most of the 86 items included in the final Achiever Personality Scale showed statistically significant and usually appreciable differences between the two groups." Fricke's failure to indicate percentage discrimination leads the reader to wonder whether the items used for this scale are actually valid. The test constructor eliminated many items of the original scale so as to reduce the intercorrelations between the Achiever Personality Scale and the other scales of the OAIS.<sup>28</sup> There is great possibility

---

<sup>27</sup> Fricke, Op. Cit., 1963, p. 77.

<sup>28</sup> Ibid., p. 79.

for intercorrelations in the OAIS because each item is scored for about three scales. As a result of these operations, Fricke<sup>29</sup> had to delete many good items from this scale. In this way he hoped to enhance the Achiever Personality Scale by giving it a certain uniqueness. This uniqueness came only after the sacrifice of some of its validity. Crites<sup>30</sup> brings out the fact that all this effort to purify this scale so that it would be statistically independent and free of response bias might have merely resulted in distorting the relationships to other variables. He<sup>31</sup> further indicates that scale purifications are only justified if they produce interscale correlations which are isomorphic to the inter-criterion relationships and because there is no such evidence given in the OAIS manual the test user can only wonder whether the whole process did accomplish what was desired.

In the realm of reliability, Fricke<sup>32</sup> has reported a test-retest stability  $r$  of .65 for an  $N$  of sixty-nine for a two-year period. When one remembers the thousands of students that Fricke was working with, he was not very much concerned about reliability. This statistic is difficult to interpret

---

29 Fricke, Op. Cit., 1963, p. 77.

30 John O. Crites, "The Opinion, Attitude and Interest Survey", in O.K. Buros, (ed.), The Sixth Mental Measurements Yearbook, Highland Park, N.J., The Gryphon Press, 1965, p. 337.

31 Ibid., p. 337.

32 Fricke, Op. Cit., 1963, p. 72.

because there are no other reliabilities of the test-retest variety to compare it with. Crites<sup>33</sup> speaks strongly against Fricke's regard for reliability and says that the test-retest reliability coefficients quoted make it doubtful whether or not the scales of the OAIS will have much predictive efficiency. Fricke<sup>34</sup> also supplied an odd-even reliability  $r$  of .62 for 1,101 freshmen. This coefficient just reinforces what Fricke has already said about the factorial complexity of this scale and its resultant low internal consistency. Crites<sup>35</sup> also indicates that unless the internal consistency of the scales of the OAIS can be increased to an acceptable level, the OAIS will be like a "shotgun" which is sometimes on the target, but more times off it.

Because of this situation with respect to reliability, the author corresponded with Fricke to see if he had done anything on the reliability of his test since the publication of his handbook. In his reply, Fricke<sup>36</sup> reiterated his stand on reliability, "I have practically no interest in reliability of test scores". He said that he was satisfied with what he

---

33 Crites, Op. Cit., p. 337.

34 Fricke, Op. Cit., 1963, p. 208-213.

35 Crites, Op. Cit., p. 337.

36 Benno G. Fricke, Chief of the Evaluation and Examinations Division, Bureau of Psychological Services of the Institute for Human Adjustment, The University of Michigan, Personal Correspondence with the Author, letter dated January 7, 1965.

had presented in the manual and had no plans to develop any further information on reliability. It was decided to do a test-retest reliability study as part of the present study because of these unusual circumstances.

A recent review of twenty studies carried out at thirteen colleges in the eastern part of the United States provides the latest and most comprehensive information on the validity of the Achiever Personality Scale. This study<sup>37</sup> revealed a median Pearson  $r$  of .36 between the Achiever Personality Scale and the college grade point average. The correlations ranged from .07 to .49 and there was an average of 221 students in each study. There were over 4,400 subjects used in this review. Because of the great variation which was possible in the validity of the Achiever Personality Scale, this writer carried out his own validation study in the college where the research project for this thesis was done. This validation was done during the summer of 1964 with the scores of the men of the entire freshmen class of 1963-64. For an  $N$  of 323 a Pearson  $r$  of .32 was found between the scores of the Achiever Personality Scale and the yearly grade point average. Since admission procedures did not change noticeably the next year it is assumed that the Achiever Personality Scale is valid for the group of students used in this study.

---

<sup>37</sup> Benno G. Fricke, "The OAIIS Test and Testing Program", Newsletter of the Inter-University Committee on the Superior Student, Vol. 7, No. 2, issue of March-April 1965, p. 46-47.

While the validity of this scale is certainly not impressive at first glance, it is meaningful if it is remembered that this scale does not correlate with intelligence and only slightly with achievement tests. The same review just mentioned cites a median Pearson  $r$  of .03 between the Achiever Personality Scale and achievement tests.<sup>38</sup>

When the Achiever Personality Scale is taken together with achievement tests and previous high school average, in a multiple regression equation, it contributes significantly to predictive validity of college grade point average.<sup>39</sup>

Although the overall picture of the QAIS may be a little glum, Webster<sup>40</sup> says that it represents a good beginning in the study of expressed attitudes of college students. Crites<sup>41</sup> further states that while the QAIS, in general, may have scant theoretical significance, the Achiever Personality Scale has achieved the goal for which it was designed and therefore infers that it may be the object of fruitful research.

---

38 Fricke, Op. Cit., 1963, p. 47-48.

39 Fricke, Op. Cit., 1963, p. 150-151.

40 Harold Webster, "The Opinion, Attitude and Interest Survey", in O.K. Buros, (ed.), The Sixth Mental Measurements Yearbook, Highland Park, N.J., 1965, p. 339.

41 Crites, Op. Cit., p. 337.

## 2. Testing the Sample.

a) The Sample.- Because this study was an inquiry into the nature of a personality measure of academic success in college, the sample was chosen from a liberal arts college. To facilitate the comparison being investigated, the sample was made to correspond as closely as possible to the group Fricke used in the standardization of his Achiever Personality Scale. For this reason, students were eliminated from the study if they had previous college experience, if they were not between seventeen and eighteen years of age, or if they were not going directly to college from high school.<sup>42</sup>

The sample had to be further restricted to males because of the sex differences in anxiety and other personality factors involved. (There were more males available than females).<sup>43</sup>

All foreign students were excluded because of the inapplicability of the test norms to them. It was not necessary to control for intelligence or verbal aptitude in this study, as is usually done in studies dealing with academic prediction, because both tools used did not relate to

---

<sup>42</sup> Fricke, Op. Cit., 1963, p. 2.

<sup>43</sup> Cattell and Eber, Op. Cit., 1962, p. 8.

intelligence<sup>44,45</sup>, and were only slightly related to verbal aptitude.<sup>46,47</sup>

As a result of the above restrictions, 480 male liberal arts college freshmen remained from the 556 students in the whole class who were initially tested.

b) Testing Procedures.- The actual testing with the OAIS and the 16PF for this study took place during the freshmen orientation week, of 1964. This program takes place before classes begin in September and is compulsory for all freshmen students. The retest for the Achiever Personality Scale took place six months later in March.

The class of 556 was broken up into five groups of about sixty each and one large group of about 250. Test administrators and proctors were made up mainly of members of the guidance and testing offices, with some teachers and a few senior students. A meeting was held several days before the testing was to be held and all who were to participate in the administration took part. At this meeting the nature of the testing and the tests to be used were discussed. Administrators were also told how to handle any questions which might be asked by the students.

---

<sup>44</sup> Fricke, Op. Cit., 1963, p. 110.

<sup>45</sup> Raymond B. Cattell and Ivan H. Scheier, The Meaning and Measurement of Neuroticism and Anxiety, New York, Ronald, 1961, p. 95.

<sup>46</sup> Fricke, Op. Cit., 1965, p. 47.

<sup>47</sup> Cattell and Scheier, Op. Cit., p. 95.

All administrators gave a general introduction to the students which included the facts that the testing was being conducted by the guidance staff of the college and that its results were to be used only by them and would not be available to either the administration or instructional staff. The students were also assured that all test results would be held in the strictest of confidence. The tests were said to be of help to the guidance office in its dealings with the students of the college. The actual presentation varied from one group to another because there was no fixed format, but this was the general tenor of the statement.

After the general explanations were given, the specific directions for each test were read from the front cover of the test booklet and any questions answered which might have come up. Because of the extreme size of the group, it was necessary to test with both forms of the 16PF on one day, so as to be sure to have scores on both forms A and B for each student. While half of the group was doing form A the other half was completing form B. A short break of ten to fifteen minutes was allowed, one and one-half hours after the testing began, while the groups had their forms exchanged. The time allotted was enough for everyone to finish the form. The testing with the 16PF took place from 9.00 a.m. to 12.00 noon. The OAIS was completed the next morning from 9.00 a.m. to 11.00 a.m. with the groups in the same arrangement.

Both the 16PF and the OAIS were machine scored by National Computer Systems of Minneapolis, Minnesota.

For the test-retest of the Achiever Personality Scale one hundred students were picked at random from the 480 students used by means of a table of random numbers. These were retested six months later in March. This time the OAIS was scored by the OAIS Testing Program of Ann Arbor, Michigan.

### 3. Specific Experimental Hypotheses.

Now that the sample, tools, and testing procedures used have been described, the specific experimental hypotheses which will be employed to test whether the Achiever Personality Scale is measuring any aspects of the second-order Anxiety factor and/or its primary factors, are stated in the null form.

1. There is no significant relation between scores on the Achiever Personality Scale of the OAIS and scores on the second-order Anxiety factor of the 16PF.
2. There are no significant differences of the mean Achiever Personality Scale scores of any of the sub-groups of the sample when separated in terms of their second-order Anxiety factor scores of the 16PF.
3. There are no significant relationships between scores on the Achiever Personality Scale of the OAIS and scores on the primary factors of the second-order Anxiety factor of the 16PF.
4. There are no significant differences of the mean Achiever Personality Scale scores of any of the sub-groups of the sample when separated in terms of the scores on each of the primary factors of the second-order Anxiety factor of the 16PF.

#### 4. Statistical Procedures.

Since reliability is of fundamental importance in any study, it was determined for both tools used. Equivalent form reliability of the 16PF for the second-order Anxiety factor and its primary sub-factors was determined by computing Pearson  $r^{48}$  correlation coefficients between raw scores on form A and form B, for all 480 subjects of the sample. These coefficients were corrected to full length by the Spearman-Brown<sup>49</sup> prophesy equation. Test-retest reliability was then determined for the Achiever Personality Scale by computing a Pearson  $r$  correlation coefficient between raw scores of the first and the second administrations for one hundred subjects who were picked at random from the 480 subjects in the sample by means of a table of random numbers.

Because the shapes of the distributions for the Achiever Personality Scale scores and the second-order Anxiety factor scores were important for the basic assumption of the analysis of variance, the Chi Square technique<sup>50</sup> was employed to test for normality of both distributions.

Pearson  $r$  correlation coefficients were computed between the Achiever Personality Scale and the second-order

---

<sup>48</sup> J.P. Guilford, Fundamental Statistics in Psychology and Education, New York, McGraw-Hill, 1956, p. 140.

<sup>49</sup> Guilford, Op. Cit., 1954, p. 354.

<sup>50</sup> Guilford, Op. Cit., 1956, p. 233.

Anxiety factor and its primaries (Factors C-Ego Strength, H-Threctia, L-Protension, O-Guilt Proneness, Q<sub>3</sub>- Will Control and Q<sub>4</sub>- Ergic Tension) employing raw scores on all scales and factors for the 480 subjects.

For those factors which did not yield a significant correlation with the Achiever Personality Scale, a single dimension analysis of variance design was employed whereby the distribution of scores was separated into five groups of ninety-six each on the basis of the Cattell factor. An F test<sup>51</sup> was employed to test whether there was any significant difference in the means of any of the sub-groups. If the F yielded a significant result the t test<sup>52</sup> was used to see where the significant differences were. If the F was insignificant no further analysis was employed.

Since a curvilinear relationship can exist when several points are significantly different from each other, it may be possible for a curvilinear relationship to be found in the analysis when examining the variables for differential effects.

If the curvilinear relationship was questionable from this analysis of differential effects an Eta<sup>53</sup> was calculated to see if a curvilinear relationship existed.

---

51 Guilford, Op. Cit., 1956, p. 224.

52 Ibid., p. 220.

53 Ibid., p. 289.

The next chapter will present and discuss the findings of these procedures in relation to the specific experimental hypotheses.

## CHAPTER III

### PRESENTATION AND DISCUSSION OF RESULTS

Having delimited the problem to testable hypotheses and having described the procedures which were used to test them, the present chapter will present and discuss the results of these operations.

It will first concern itself with the reliabilities of the Cattell factors and the Achiever Personality Scale; then the normality of the distributions of the Anxiety and Achiever Personality Scale scores are discussed. While these procedures do not deal directly with the main hypotheses they are important insofar as the study implicitly rests on them.

After these preliminary considerations are presented the relations obtained between the Achiever Personality Scale scores and the Anxiety scores are set forth and discussed. Next the relations obtained between the Achiever Personality Scale scores and the sub-factors of Anxiety are presented and then those sub-factors which did not yield significant correlations with the Achiever Personality Scale scores are analyzed to see if there were any differential associations between them and the Achiever Personality Scale scores.

The chapter ends with several implications for further research.

### 1. Preliminary Considerations.

a) Reliability of the Cattell Factors.- Reliability coefficients for the scales employed of the 16PF for both the college freshmen sample and the normative general population of Cattell, et al.<sup>1</sup> are presented in Table I. Alternate form reliability was computed for forms A and B by means of the Pearson coefficient of correlation for this study. These coefficients were corrected to full length by means of the Spearman-Brown formula. The reliability coefficients determined by Cattell et al. are presented here for the purpose of comparison and are also of the alternate form variety for forms A and B and were also corrected by means of the Spearman-Brown formula.

The reliabilities obtained in this study range from a low of .39 for factor L-Protension to a high of .89 for the second-order Anxiety factor. All but two coefficients are above .67. When comparing these coefficients with those of Cattell et al., it can be easily seen that those obtained for this study generally exceed them. Hence this study has achieved somewhat greater reliability with these instruments than the test authors themselves.

---

<sup>1</sup> R.B. Cattell, D.R. Saunders, and G.F. Stice, Tabular Supplement to the Handbook for the Sixteen Personality Questionnaire, Champaign, Illinois, Institute for Personality and Ability Testing, 1957, p. 20.

Table I.-

Reliability Coefficients for the Second-Order Anxiety Factor and Its Primary Components for Forms A and B of the 16PF.

| <u>16PF</u><br>Scale | Low Score<br>Description | High Score<br>Description | <u>Coefficients</u>  |                      |
|----------------------|--------------------------|---------------------------|----------------------|----------------------|
|                      |                          |                           | Present <sup>a</sup> | Cattell <sup>b</sup> |
| C                    | emotional                | mature, calm              | .67                  | .44                  |
| H                    | timid, shy               | adventurous               | .88                  | .73                  |
| L                    | trustful                 | suspicious                | .39                  | .41                  |
| O                    | confident                | worrying, insecure        | .72                  | .62                  |
| Q <sub>3</sub>       | lax, uncontrolled        | controlled                | .50                  | .52                  |
| Q <sub>4</sub>       | composed                 | tense, excitable          | .74                  | .64                  |
| F(Q)II               | low anxious              | high anxious              | .89                  | -                    |

a College freshmen sample, N of 480, Pearson r alternate form coefficients corrected by the Spearman-Brown formula to full length.

b Normative sample of Cattell, Saunders, and Stice, N of 390 students and non-students giving general population range, Pearson r alternate form coefficients corrected by the Spearman-Brown formula to full length.

Although these reliabilities do seem a little low, they are acceptable for the purposes of this study because of the size of the sample used and the fact that the use of both forms A and B insured adequate sampling of the factors as the authors indicate.<sup>2</sup> It should be remembered that the authors of the 16PF placed more emphasis upon the range and discriminating ability of these factors than on their reliabilities.<sup>3</sup> Also because these factors are factorially pure they are capable of high validities even with relatively low reliabilities. Further, when these obtained reliabilities are compared with other questionnaire measures of personality, it is easily seen that those obtained here do not differ very much.<sup>4,5</sup>

b) Reliability of the Achiever Personality Scale.- The test-retest reliability of the Achiever Personality Scale for a random N of 100 and a retest interval of six months was found to be .73. This value is greater than either the .65 or the

---

2 Raymond B. Cattell and Herbert W. Eber, Handbook for the Sixteen Personality Factor Questionnaire, Champaign, Illinois, Institute for Personality and Ability Testing, 1957, p. 3.

3 Ibid., p. 3.

4 A.L. Edwards, Manual for the Edwards Personal Preference Schedule, New York, Psychological Corporation, 1959, p. 19.

5 S.R. Hathaway and J.C. McKinley, Manual for the Minnesota Multiphasic Personality Inventory, New York, Psychological Corporation, 1951, p. 7.

.62 which Fricke<sup>6</sup> found. It is very meaningful because the sample used here was a true random sample and the test-retest period was only six months, whereas the test-retest reliability which Fricke cites is based on an indeterminate sample of sixty-nine with an interval of two years. (It was not possible to compute an internal consistency type of reliability because no scoring keys are available.)

Although this coefficient is also not exceedingly high, it is as high as many other reliabilities of other personality variables<sup>7,8</sup> as is revealed by the discussion of the reliability of the factors of the 16PF just a few pages previously. The obtained reliability of this scale is also high enough for the purposes of this study when the size of the sample used is taken into consideration.

c) Normality of the Major Variables.- Because the analysis of variance technique was to be used and has normality of both variables as an assumption<sup>9</sup>, it was thought best to test to see if both of the major variables were, in fact, normally distributed in the sample. Tables II and III, present

---

<sup>6</sup> Benno G. Fricke, Opinion, Attitude and Interest Survey Handbook: A Guide to Personality and Interest Measurement, Ann Arbor, Michigan, University of Michigan, 1963, p. 208, 213.

<sup>7</sup> Edwards, Op. Cit., p. 19.

<sup>8</sup> Hathaway and McKinley, Op. Cit., p. 7.

<sup>9</sup> Quinn McNemar, Psychological Statistics, Third Edition, New York, Wiley, 1962, p. 252.

Table II.-

Frequency Distributions and Chi Squares for Achiever Personality Scale Scores for Two Different Class Intervals.

| Class                 | $f_0$      | $f_t$         | $(f_0 - f_t)^2 / f_t$                 |
|-----------------------|------------|---------------|---------------------------------------|
| Grouping I, $df = 7$  |            |               |                                       |
| 50-54                 | 3)         | 1.60)         |                                       |
| 45-49                 | 4)         | 6.51)         | 8.11                                  |
| 40-44                 | 17         | 18.80         | .17                                   |
| 35-39                 | 51         | 43.00         | 1.49                                  |
| 30-34                 | 69         | 73.96         | .33                                   |
| 25-29                 | 87         | 96.93         | 1.02                                  |
| 20-24                 | 113        | 96.93         | 2.66                                  |
| 15-19                 | 64         | 73.96         | 1.34                                  |
| 10-14                 | 47         | 43.00         | .37                                   |
| 5-9                   | 12         | 18.80         | 2.46                                  |
| 0-4                   | 13         | 6.51          | 6.47                                  |
|                       | <u>480</u> | <u>480.00</u> | <u>16.46<sup>a</sup></u> = Chi Square |
| Grouping II, $df = 2$ |            |               |                                       |
| 50-59                 | 3)         | 1.85)         |                                       |
| 40-49                 | 21)        | 19.91)        | 21.76                                 |
| 30-39                 | 120        | 118.22        | .027                                  |
| 20-29                 | 200        | 209.50        | .431                                  |
| 10-19                 | 111        | 111.92        | .008                                  |
| 0-9                   | 25         | 18.60         | 2.199                                 |
|                       | <u>480</u> | <u>480.00</u> | <u>3.149<sup>b</sup></u> = Chi Square |

a For 7 degrees of freedom Chi Square = 14.07, 16.62, and 18.62 for  $p = .05$ ,  $p = .02$ , and  $p = .01$ , respectively.

b For 2 degrees of freedom Chi Square = 3.22, 4.60, 5.99, and 9.21 for  $p = .20$ ,  $p = .10$ , and  $p = .05$  and  $p = .01$ , respectively.

Table III.-

Frequency Distributions and Chi Squares for the Second-Order Anxiety Factor Scores for Two Different Class Intervals.

| Class               | $f_0$ | $f_t$  | $(f_0 - f_t)^2 / f$             |
|---------------------|-------|--------|---------------------------------|
| Grouping I, df = 6  |       |        |                                 |
| 9-9.9               | 17    | 12.89  | 1.31                            |
| 8-8.9               | 40    | 28.87  | 4.29                            |
| 7-7.9               | 44    | 53.98  | 1.84                            |
| 6-6.9               | 80    | 82.21  | .06                             |
| 5-5.9               | 79    | 96.48  | 3.17                            |
| 4-4.9               | 96    | 89.89  | .42                             |
| 3-3.9               | 72    | 65.29  | .69                             |
| 2-2.9               | 31    | 33.80  | .23                             |
| 1-1.9               | 21    | 16.59  | .70                             |
|                     | 480   | 480.00 | 12.71 <sup>a</sup> = Chi Square |
| Grouping II, df = 2 |       |        |                                 |
| 9-10.99             | 57    | 44.11  | 3.77                            |
| 7-8.99              | 124   | 137.95 | 1.41                            |
| 5-6.99              | 175   | 187.68 | .86                             |
| 3-4.99              | 103   | 93.22  | 1.03                            |
| 1-2.99              | 21    | 17.04  | .92                             |
|                     | 480   | 480.00 | 7.99 <sup>b</sup> = Chi Square  |

a For 6 degrees of freedom, Chi Square = 12.59, 15.03, 16.81 for  $p = .05$ ,  $p = .02$ , and  $p = .01$  levels of confidence, respectively.

b For 2 degrees of freedom, Chi Square = 5.99, 7.82, and 9.21 for  $p = .05$ ,  $p = .02$ , and  $p = .01$  levels of confidence, respectively.

the Chi Square calculations for the distributions of scores on the Achiever Personality Scale and the second-order Anxiety factor, respectively. The analysis had to be repeated for both distributions because the doubtful  $p=.05$  level was initially surpassed. Upon regrouping, the Chi Square for the distribution of Achiever Personality Scale scores dropped below the  $p=.20$  level indicating that it was probably well within the limits of normality.

When regrouped, the distribution of the second-order Anxiety factor scores yielded a Chi Square which, while surpassing the  $p=.02$  level of confidence, was not statistically significant. The tendency not to be normally distributed seems present because of the large value of the Chi Square. Such a tendency might be explained in terms of the restrictions placed on the sample. The reader will remember how the age range of the sample had to be restricted from seventeen to eighteen years of age in order to comply with Fricke's standardization group. Cattell and Scheier<sup>10</sup> bring out the fact that anxiety is usually very high in the adolescent years and drops as adulthood is reached. Work by Bendig<sup>11</sup> and

---

10 Raymond B. Cattell and Ivan H. Scheier, The Meaning and Measurement of Neuroticism and Anxiety, New York, Ronald, 1961, p. 262.

11 A.W. Bendig, "Social Desirability and Anxiety Variables in the IPAT Anxiety Scale", Journal of Consulting Psychology, Vol. 23, No. 4, issue of August 1959, p. 377.

Warburton, Butcher, and Forrest<sup>12</sup> has revealed a non-significant and virtually zero correlation between chronological age and the questionnaire Anxiety factor F(Q)II. They<sup>13</sup> interpret this to mean that anxiety is, on the average, at a relatively constant level during the college years. Because the members of this sample are just entering freshmen it seems that their distribution of anxiety scores might tend to be slightly misshapen in the high direction, as seems to be the case here.

Because the Chi Square of the distribution of the second-order Anxiety factor scores did not equal or surpass the  $p=.01$  level of confidence it will be treated as falling within the limits of a normal distribution of scores.

## 2. Anxiety Versus the Achiever Personality Scale.

Table IV presents the Pearson correlation coefficients between the scores on the Achiever Personality Scale and the scores on the second-order Anxiety factor and its primary components. Because scores on the second-order Anxiety factor were not found to be significantly correlated with scores on the Achiever Personality Scale, hypothesis 1 which stated that there is no significant relation between scores on these two variables, must be accepted. This finding is supported by the

---

12 Cattell and Scheier, Op. Cit., p. 262.

13 Ibid.

Table IV.-

Correlation Coefficients between the Scores of the Achiever Personality Scale and the Second-Order Anxiety Factor and Its Primary Components for Forms A and B, Combined of the 16PF.

| <u>16PF</u><br>Scale | Low Score<br>Description | High Score<br>Description | Pearson r<br>Coefficients |
|----------------------|--------------------------|---------------------------|---------------------------|
| C                    | emotional                | mature, calm              | .07                       |
| H                    | timid, shy               | adventurous               | <u>-.25<sup>a</sup></u>   |
| L                    | trustful                 | suspicious                | <u>-.20</u>               |
| O                    | confident                | worrying, insecure        | .08                       |
| Q <sub>3</sub>       | lax, uncontrolled        | controlled                | <u>.23</u>                |
| Q <sub>4</sub>       | composed                 | tense, excitable          | -.09                      |
| F(Q)II               | low anxious              | high anxious              | -.06                      |

<sup>a</sup> With N of 480, Pearson correlation coefficients underlined are significant beyond the .01 level of confidence.

work of Zaynor<sup>14</sup> who failed to find a significant relationship between anxiety and cumulated average for 277 students in introductory psychology.

The results obtained in the present study also tends to be consistent with the Cattell-Scheier theory<sup>15</sup> where anxiety seems to be related to achievement only in a specialized dynamic sense in which insecurity causes concentration on a particular kind of outlet. The fact that the Achiever Personality Scale is used to predict an academic level of achievement for each student in a college would seem to indicate that it is measuring an area of personality which is distributed through the college in a continuous fashion and is related to academic achievement. While anxiety, as the authors say<sup>16</sup>, is distributed throughout the college in a continuous fashion, some students in a college may be achieving because of it. That is, some students will probably achieve more because their insecurity causes them to concentrate more on their academic endeavors. However, it does not seem reasonable to assume that all college students are achieving because of insecurity. Because all college students

---

<sup>14</sup> Jo Ann Zaynor, The Relationship of Selected Intellectual and Non-Intellectual Variables to Academic Achievement, unpublished Master's thesis, presented to the University of Hawaii, 1961, p. 41.

<sup>15</sup> Cattell and Scheier, Op. Cit., p. 94-96.

<sup>16</sup> Ibid., p. 286.

are probably not achieving as a result of insecurity and because Cattell's Anxiety factor seems to be related to learning only in this highly restricted manner, it does seem understandable that the Achiever Personality Scale scores were not found related to scores on the second-order Anxiety factor.

The statistical method of correlation is an overall analysis. It provides an average relation between deviations of score points about a line.<sup>17</sup> Since it is an averaging process it tends to eliminate the significance of individual score deviations themselves. Hence this averaging process could very easily hide more complex distributions and relationships from view. As a result of this the next step in the statistical analysis should be more sensitive. The next procedure will be to analyze the Achiever Personality Scale scores of the distribution at different levels of Anxiety. This method will reveal if there are any differential associations between scores on the Achiever Personality Scale and scores on the second-order Anxiety factor.

The analysis of variance for the five sub-groups of different levels of anxiety is reported in Table V. This analysis indicates that no significant differences were found between the Achiever Personality Scale scores for any of the sub-groups of different levels of anxiety. As a result of this, hypothesis 2, which stated that there are no significant

---

17 McNemar, Op. Cit., p. 119-123.

Table V.-

Analysis of Variance of Achiever Personality Scale Scores for  
Five Groups of Different Levels of the Second-Order  
Anxiety Factor of the 16PF, Forms A and B Combined.

| Source  | Sums of Squares | df  | Variance Estimate | F                 |
|---------|-----------------|-----|-------------------|-------------------|
| Between | 145             | 4   | 36.25             | .403 <sup>a</sup> |
| Within  | 42,240          | 475 | 89.93             |                   |
| Total   | 42,385          | 479 |                   |                   |

<sup>a</sup> For 4 and 475 degrees of freedom F equals 2.37 and 3.34 at the .05 and .01 levels, respectively.

differences between the mean Achiever Personality Scale scores of any of the sub-groups of the sample with various levels of Anxiety, must be accepted. The results of this analysis might be interpreted to infer that the score obtained on the Achiever Personality Scale will not vary as a result of a person's Anxiety level. Hence the Achiever Personality Scale does not appear to be related to anxiety.

Not finding any differential associations between Anxiety and the Achiever Personality Scale scores does not, at first, seem consistent with the rough trend which Cattell and Scheier<sup>18</sup> say may exist between low anxiety and academic success. This inconsistency, however, may be accounted for in terms of the actual construction of the Achiever Personality Scale and the imprecision of the trend itself. The Achiever Personality Scale is just a group of empirically derived statements which were found to be related to college grade point average, but not to either intelligence or aptitude test scores.<sup>19</sup> It must be further stated that this scale actually is little related to academic success. (This scale was developed to add to the amount of prediction which could be made when it was taken together with the traditional forecasters of grade average.) Therefore because this scale

---

18 Cattell and Scheier, Op. Cit., p. 263-264.

19 Fricke, Op. Cit., p. 3.

is not a good measure of academic success and because the relationship between low anxiety and scholastic success is slight, the inability to find low anxiety associated with high Achiever Personality Scale scores does seem consistent.

Because the second-order Anxiety factor adds together the effects of several personality factors, it can easily mask what role these personality factors may play themselves. By next analyzing the relations between the scores on the sub-factors of Anxiety and the scores on the Achiever Personality Scale it may be possible to obtain a clearer picture of the actual composition of the Achiever Personality Scale.

### 3. Anxiety Primaries Versus the Achiever Personality Scale.

Table IV presents the Pearson correlation coefficients between the scores on the Achiever Personality Scale and the scores on the sub-factors of the second-order Anxiety factor. Factors H-Threats, L-Pretension, and Q<sub>3</sub>-Will Control were found to be significantly correlated with the Achiever Personality Scale well beyond the  $p=.01$  level of confidence, while Factors C-Ego Strength, O-Guilt Proneness, and Q<sub>4</sub>-Ergic Tension were not found to correlate significantly.

The question now arises why some factors were found to be significantly correlated with the Achiever Personality Scale while others were not. Before attempting to answer this question, hypothesis 4 should be examined. It states that

there are no significant differences in the mean Achiever Personality Scale scores between any of the sub-groups of the sample when separated on the basis of their C, O, and Q<sub>4</sub> Factor scores. By examining this further analysis a discussion relative to why and why not certain sub-factors of anxiety were found related to the Achiever Personality Scale scores can be more complete.

Tables VI and VII show the results of the analysis of variance of the Achiever Personality Scale Scores for the five sub-groups of different levels of Factors C-Ego Strength and O-Guilt Proneness. The data of this study failed to reveal any significant differences between the Achiever Personality Scale scores and any of the sub-groups of the sample for Factors C-Ego Strength and O-Guilt Proneness. Because of these findings hypothesis 4 must be accepted. These results indicate that scores on the Achiever Personality Scale were not found to be influenced by different levels of emotional maturity and emotional sensitivity.

The results of the analysis of variance of the Achiever Personality Scale scores for the five sub-groups of different levels of Factor Q<sub>4</sub>-Ergic Tension is shown in Table VIII. While the data did not show any significant differences of the Achiever Personality Scale scores between the five sub-groups of different levels of Factor Q<sub>4</sub>-Ergic Tension, the level of confidence surpassed was quite high. As this finding

Table VI.-

Analysis of Variance of Achiever Personality Scale Scores for Five Groups of Different Levels of Factor C (Ego Strength) of the 16PF, Forms A and B Combined.

| Source  | Sums of Squares | df  | Variance Estimate | F                  |
|---------|-----------------|-----|-------------------|--------------------|
| Between | 408             | 4   | 102.00            | 1.154 <sup>a</sup> |
| Within  | 41,977          | 475 | 88.32             |                    |
| Total   | 42,385          | 479 |                   |                    |

<sup>a</sup> For 4 and 475 degrees of freedom F equals 2.37 and 3.34 at the .05 and .01 levels, respectively.

Table VII.-

Analysis of Variance of Achiever Personality Scale Scores for Five Groups of Different Levels of Factor O (Guilt Proneness) of the 16PF, Forms A and B Combined.

| Source  | Sums of Squares | df  | Variance Estimate | F                  |
|---------|-----------------|-----|-------------------|--------------------|
| Between | 475             | 4   | 118.75            | 1.345 <sup>a</sup> |
| Within  | 41,910          | 475 | 88.23             |                    |
| Total   | 42,385          | 479 |                   |                    |

<sup>a</sup> For 4 and 475 degrees of freedom F equals 2.37 and 3.34 at the .05 and .01 levels, respectively.

Table VIII.-

Analysis of Variance of Achiever Personality Scale Scores for Five Groups of Different Levels of Factor Q<sub>4</sub> (Ergic Tension) of the 16PF, Forms A and B Combined.

| Source  | Sums of Squares | df  | Variance Estimate | F                  |
|---------|-----------------|-----|-------------------|--------------------|
| Between | 960             | 4   | 240.00            | 2.571 <sup>a</sup> |
| Within  | 41,425          | 475 | 87.21             |                    |
| Total   | 42,385          | 479 |                   |                    |

<sup>a</sup> For 4 and 475 degrees of freedom F equals 2.37 and 3.34 at the .05 and .01 levels, respectively.

was almost significant it was decided to compute an Eta to see if a non-linear relationship existed between these two variables. The eta was computed to be .11 and was not significant; hence, no significant non-linear relationship was found. As a result of these statistical analysis on the scores of the Achiever Personality Scale and Factor Q<sub>4</sub>-Ergic Tension, it was found that scores on the Achiever Personality Scale were not found to be influenced by different levels of Factor Q<sub>4</sub>-Ergic Tension.

Hence, in total, hypothesis 4 was accepted because no significant differences were obtained between the mean Achiever Personality Scale scores of any of the sub-groups of the sample when separated in terms of their C-Ego Strength, O-Guilt Proneness, and Q<sub>4</sub>-Ergic Tension factor scores. That is, no differential associations between the scores on these factors and scores on the Achiever Personality scale were found. In the light of these results the discussion of the Achiever Personality Scale must center around the three significant correlations which were obtained for Factors H, L, and Q<sub>3</sub> and the completely insignificant results which were found for Factors C, O, and Q<sub>4</sub>.

When some of the loadings of these primary factors are investigated, it seems that Factors H(-), L(-), and Q<sub>3</sub>(+) may be more involved with those aspects of personality which deal more directly with the actual achieving than do

Factors C, O, and Q<sub>4</sub>. The person low on Factor H-Threctia<sup>20</sup> is shy, timid, withdrawn, and his interests are restricted. He is also careful, considerate and quick to see dangers. Hence, it seems that the person is not just withdrawn but is alert and able to respond to stimuli which are of a restricted nature. The person low on Factor L-Protension<sup>21</sup> is accepting, adaptable, understanding, open, and ready to take a chance. This kind of a person seems to be open to stimuli and ready to take a position which will allow him to be successful in adjusting to them. Finally, a person who scores high on Factor Q<sub>3</sub>-Will Control<sup>22</sup> tends to be will-directed, controlled, exacting, persistent, conscientious, considerate of others, and to have foresight. A person with this makeup seems to be a will-directed person who is able to control his interaction so that he can be effective.

This triad of relations with these factors seems to construct an introversive kind of person who is aware of stimulations which are present, and very exact, volitional, and precise in his response to these stimuli. This cluster of relations appears to contain many aspects of personality

---

20 Raymond B. Cattell, Personality and Motivation Structure and Measurement, Yonkers, World Book, 1957, p. 126-130.

21 Ibid., p. 143-146.

22 Ibid., p. 212-215.

which are known to yield results in academic pursuits. Research has shown that most successful students tend to be more introversive, exacting, volitional, and more observant than successful students.<sup>23</sup>

In contrast, however, Factor C-Ego Strength<sup>24</sup> deals more with a person's emotional integration. It involves a person's capacity to express available emotional energy along integrated as opposed to impulsive channels. Factor C-Guilt Proneness<sup>25</sup> deals with the emotional sensitivity of the person. In other words, how "poor in spirit" the person is. That is, how able is the person to accept his fearfulness and abasement without hostility or attempts at over-compensation. Finally, Factor Q4-Ergic Tension<sup>26</sup> deals with the available drive which is being over-controlled by the person's defenses and dealings with reality. This factor can be thought of as rejected "id" demand: the "id" drive which is not allowed to express itself because of the restrictions placed on it by the controlling ego.

While the analysis of these three factors also yields some fruitful results, it also leaves some confusion. It

---

<sup>23</sup> C. Burleigh Wellington and Jean Wellington, The Underachiever: Challenges and Guidelines, Chicago, Rand McNally, 1965, p. 21-23.

<sup>24</sup> Cattell, Op. Cit., p. 100-103.

<sup>25</sup> Ibid., p. 151-154.

<sup>26</sup> Ibid., p. 215-218.

appears that Factors C and O differ from the general trend of the first triad because they deal so exclusively with emotional control. Cattell, however, says that Factor C has been shown to be somewhat like Factor Q<sub>3</sub>. He says<sup>27</sup> that C, however, differs from Q<sub>3</sub> insofar as C is more massive, less conscious, and more in the area of stability and integration. Hence, while these two factors are somewhat the same and might be expected to be involved in the Achiever Personality Scale, they are basically different, the difference being the strong tones of emotional stability and emotional integration found in Factor C.

The inability to find any relationship between Factor Q<sub>4</sub> and the Achiever Personality Scale, however, is almost unexplainable in this analysis. It may be involved in emotional integration to the extent that some limits of integration are placed on the energy so that it does not just dispel itself freely into the environment. On the other hand, the amount of energy available to a student will certainly influence his potential and consequently his actual achievement. In view of this it seems that Q<sub>4</sub> should have been found to be related to the Achiever Personality Scale because of the importance of drive in achieving.

---

<sup>27</sup> Cattell, Op. Cit., p. 214.

Now the fact that Factors H, L, and Q<sub>3</sub> were found to be related with the Achiever Personality Scale would tend to say that Fricke's scale is measuring a personality complex which is, on the basis of this study, introversive, volitional, and exacting in nature. The inability to find any relation between the Achiever Personality Scale and Factors C, O, and Q<sub>4</sub> would tend to say that Fricke's scale was not found to measure anything in the area of emotional stability or drive.

Why the Achiever Personality Scale seems to be measuring some aspects of Factors H, L, and Q<sub>3</sub> while not measuring any aspects of Factors C, O, and Q<sub>4</sub> is not quite certain. Cattell's<sup>28</sup> research has shown that all these factors are involved in academic success. Factors C, O, and Q<sub>4</sub> are weighted more in his specification equation for grades than are factors H, L, and Q<sub>3</sub>. Hence, Cattell has found them to be more important than the other factors in predicting academic success. The way Fricke constructed his scale may shed some light on this problem. This scale is measuring what Fricke calls "Achiever Personality" but because he has removed<sup>29</sup> from this scale all of its relations with intelligence and aptitude test scores, he has in fact changed what might be considered to be the popular conception of an achieving

---

28 Cattell and Scheier, Op. Cit., p. 262.

29 Fricke, Op. Cit., p. 75-81.

personality. Hence, it seems that what relations this scale does have with personality variables will differ from what has been usually found because of the way he constructed it.

This study was able to contribute very slightly to the understanding of the composition and operation of the Achiever Personality Scale and because of this further research is necessary to determine its exact nature.

#### 4. Suggestions for Further Research.

Although the present study has contributed little to the understanding of Fricke's Achiever Personality Scale, nevertheless, it has uncovered aspects which might prove fruitful for future research on this and other associated problems.

The reliability of the Achiever Personality Scale does not seem to be clearly understood and future research might study it for retest periods which are up to two or more years long. This would help to better understand the workings of this scale.

Although the distribution of scores on the second-order Anxiety factor, for this sample, was of the normal form, future research might analyze the form of the distribution of the scores on this factor for each year in college and/or university. This might yield some results which might prove helpful in understanding possible factors which might be influencing achievement in college indirectly.

Because Factors C-Ego Strength and G-Guilt Proneness deal with emotional integration and were not found related to the Achiever Personality Scale and because Fricke's OAIS does have an Emotional Adjustment Scale, it might be possible that these factors would be related to this scale. If these factors are related to this scale, it might be possible to further increase the amount of predictability by using the Achiever Personality Scale together with the Emotional Adjustment Scale. If this does improve prediction, it might be because more of the personality variables which Cattell includes in his specification equation for grades would be included.

Also because of the large but insignificant results obtained with Factor Q<sub>4</sub>-Ergic Tension, it seems that further research should be done with this factor to determine its relation with all kinds of achievement and learning.

As this study employed the questionnaire measure of anxiety, F(Q)II, it might be desirable to see what results would be obtained if one of Cattell's objective measures of anxiety were employed. Objective test measures overcome or greatly minimize certain difficulties which are encountered when using questionnaire measures. These difficulties include (1) the inability of a person to properly judge himself as is demanded in self-rating types of questionnaires and (2) the element of motivational distortion which is usually present.

Last of all in order to understand the composition and operation of the Achiever Personality Scale it should be correlated with a complete personality battery, such as all the primary and secondary factors of the 16PF.

## SUMMARY AND CONCLUSIONS

Although many personality scales have been used to try to increase the prediction of academic success in college, generally this practice has not resulted in any appreciable improvement. Fricke, however, constructed a personality scale which has been shown to add significantly to the amount which the traditional measures can predict. This scale, the Achiever Personality Scale, is of indeterminate nature because of its empirical development. To yield some understanding into the nature of this scale it was studied in relation to a general measure of anxiety and its components on the Sixteen Personality Factor Questionnaire (16PF). The Achiever Personality Scale was not found to be significantly correlated with this composite measure of anxiety (Cattell's factor F(Q)II). This result is consistent with the evidence offered by Cattell which seems to indicate that this anxiety factor can only be related to achievement when insecurity causes concentration in a particular kind of outlet.

Inasmuch as the primary factors of anxiety, of the 16PF, have been shown to be associated with academic success, it was thought that they might be related to the scale in question. This was not found to be true insofar as Factors C-Ego Strength, O-Guilt Proneness, and Q<sub>4</sub> Ergic Tension did not yield significant correlations with the Achiever Personality Scale. It was, however, found to be true insofar

as Factors H-Threectia, L-Protension, and Q<sub>3</sub>-Will Control correlated significantly with this scale. These results seem to indicate that this scale is measuring a personality complex which is of an introversive, aware, precise, and volitional composition. It does not seem to include any areess of emotional integration or drive.

The somewhat inconsistent results obtained in this study may be accounted for by the extremely empirical nature of this scale which greatly restricted the areas of personality covered by restricting initial relationships.

In view of some of the limitations of questionnaire measures of personality, future research should be made to determine if Fricke's scale is related to more objective measures of anxiety. Further, a comprehensive analysis of the personality composition of the Achiever Personality Scale is needed in order to determine more completely what areas of personality it is measuring.

Until such a time as the personality composition of this scale is determined, it will yield mysterious results for those who use it for academic prediction and counselling.

## BIBLIOGRAPHY

Cattell, Raymond B., Personality and Motivation Structure and Measurement, New York, World Book, 1957, xxiv-948 p.

A fundamental book for the Cattell theory of personality. It is of special interest to this study because of its considerations of anxiety and its primary factors in the questionnaire realm.

Cattell, Raymond B., and Herbert W. Eber, Handbook for the Sixteen Personality Factor Questionnaire, Champaign, Illinois, Institute for Personality and Ability Testing, 1962, ii-54 p.

A presentation of the general rationale of the test along with some of its specific statistics and applications.

Cattell, Raymond B., and Ivan H. Scheier, "The Nature of Anxiety: A Review of Thirteen Multivariate Analyses Comprising 814 Variables", Psychological Reports, Vol. 4, No. 2, issue of June 1958, p. 351-388.

This study concentrated massive research on the nature of anxiety and helped the authors to formulate their theory about it.

-----, The Meaning and Measurement of Neuroticism and Anxiety, New York, Ronald, 1961, iii-535 p.

The definitive work, thus far, on Cattell's conceptions of anxiety and neuroticism. It was especially important because it supplied most of the theory from which this study operated.

Fricke, Benno G., The Development of an Empirically Validated Personality Test Employing Configural Analysis for the Prediction of Academic Achievement, unpublished doctoral thesis presented to the University of Minnesota, Minneapolis, 1954, ii-312 p.

This thesis contains a review of studies which were carried out at the University of Minnesota, in the area of academic prediction. It covers twenty-two studies which used non-personality measures for academic prediction and eighteen studies which used personality measures for academic prediction. Fricke also presents the rationale for his Achiever Personality Scale which was, at the time, in its infant stages.

Fricke, Benno G., Opinion, Attitude and Interest Survey Handbook: A Guide to Personality and Interest Measurement, Ann Arbor, University of Michigan, 1963, x-281 p.

Here Fricke presents a revision of his test and includes comprehensive information as to its rationale, construction, validity, and for this study, lack of content of the Achiever Personality Scale.

-----, "The OAIS Test and Testing Program", Newsletter of the Inter-University Committee on the Superior Student, Vol. 7, No. 2, issue of March-April 1965, p. 44-50.

A presentation of the latest information as to the validity of the OAIS. It is a summary of twenty studies which were carried out at thirteen colleges in the eastern part of the United States.

Garrett, Harley F., "A Review and Interpretation of Investigations of Factors Related to Scholastic Success in Colleges of Arts and Science and Teachers Colleges", Journal of Experimental Education, Vol. 18, No. 2, issue of December 1949, p. 91-138.

A comprehensive review of many studies which were used to predict academic success in many ways.

Corsuch, Richard L., and Raymond B. Cattell, "Second Strata Personality Factors Defined in the Questionnaire Medium by the 16PF", in press.

The latest analysis which reconfirms the existence of Cattell's Anxiety factor in the questionnaire realm by rotating the raw data of eight independent studies.

Thorndike, Robert L., The Concepts of Over- and Underachievement, New York, Teachers College, Columbia University, 1963, ii-78 p.

An attempt to deal with some of the problems encountered in studying over- and underachievement. It points out some methodological problems and possible errors to be avoided as well as suggesting precautions to be observed in order to obtain results which will be sound and meaningful. This was helpful in clarifying some thinking about basic concepts and methodological imprecisions of Fricke in constructing his scale.

Fuel, John K. and Rosemary Wursten, "The Influence of Intra-personal Variables on Academic Achievement", California Journal of Educational Research, Vol. 16, No. 2, issue of March 1965, p. 58-64.

This presents a review of thirty-six studies done from 1959-1963 in the area of personality variables involved

in academic achievement. It indicates contemporary interest in anxiety as one of the most frequent variables examined in relation to this problem.

Spence, Kenneth W., "Anxiety (Drive) Level and Performance in Eyelid Conditioning", Psychological Bulletin, Vol. 61, No. 2, Issue of February 1964, p. 129-139.

A review of twenty-five studies conducted with the Taylor Manifest Anxiety Scale and learning. It was instrumental in the present study for having revealed a series of learning experiments where differential effects occurred with subjects of varying levels of anxiety.

Wellington, C. Burleigh, and Jean Wellington, The Underachiever: Challenges and Guidelines, Chicago, Rand McNally, 1965, 1-122 p.

Here is found a study of some research on underachievement which includes background material for selection and assessment as well as some original research and some conclusions on underachievement. This was helpful in providing some problems and an overview of the underachiever especially with respect to personality composition.

Wright, Stuart, Some Psychological and Physiological Characteristics of Certain Academic Underachievers, unpublished doctoral thesis presented to the University of Chicago, Illinois, 1954, 111-113 p.

A careful study of two groups of students which were matched on intellectual factors, but yet were achieving at different levels. This study also aided in giving the present study direction by showing that some of the primary factors of anxiety were involved in different levels of academic achievement.

APPENDIX 1

ABSTRACT OF

The Achiever Personality Scale in Relation to  
Anxiety and Its Sub-Factors

## APPENDIX 1

### ABSTRACT OF

#### The Achiever Personality Scale in Relation to Anxiety and Its Sub-Factors.

Many attempts have been made to increase the predictability of college achievement beyond the usual limit reached by traditional means, by using measures of personality.

Fricke claims to have made a significant contribution to the realm of personality prediction of college grades by constructing the Achiever Personality Scale. While this scale has been shown to be valid in different colleges its exact composition in terms of basic personality variables is not known.

This project was an attempt to experimentally clarify the composition of this scale by using it in conjunction with a measure of anxiety and its sub-factors, for a freshmen class of 480 men from a liberal arts college. Each student completed the Sixteen Personality Factor Questionnaire (16PF), forms A and B, and the Opinion, Attitude and Interest Survey (OAIS). Correlations were computed between the Achiever Personality Scale of the OAIS and the second-order Anxiety factor of the 16PF, and its primary, constituent factors. Unidimensional

---

1 Joseph L. Rizko, Master's thesis presented to the Faculty of Psychology and Education of the University of Ottawa, Ontario, May 1966, ix-71 p.

analyses of variance of the Achiever Personality Scale scores were used for those aspects of anxiety which did not yield significant correlations in order to determine possible differential associations.

The results upheld the hypothesis of no significant relation between the second-order Anxiety factor and the Achiever Personality Scale. Among the primary factors of Anxiety, Factors H, L, and Q<sub>3</sub> correlated significantly with the Achiever Personality Scale, while Factors C, O, and Q<sub>4</sub> did not.

The various levels of anxiety could not be differentiated on the basis of Achiever Personality Scale scores. Similarly, various levels of Factors C, O, and Q<sub>4</sub> were not differentiated by the Achiever Personality Scale scores.

Among the explanations offered to account for these results, it was suggested that the Achiever Personality Scale was not measuring any aspects of anxiety. This seemed to be because it offers a predicted grade level for each student while anxiety seems to be related to achievement in a highly limited and dynamic sense which might apply to a few students.

The significant correlations with Factors H, L, and Q<sub>3</sub> seemed to suggest that this scale is measuring a complex which contains the idea of an introverted, precise, and willful person. The failure of Factors C, O, and Q<sub>4</sub> to relate with it was said to suggest that this scale is not measuring anything in the areas of emotional stability and integration or drive.

In the light of the present findings suggestions were made for further research.