

RELATIONSHIP OF THE ACHIEVER PERSONALITY
AND THE OASIS TO ACADEMIC SUCCESS
AND TO THE SELF CONCEPT

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PREFACE

This dissertation is concerned with describing the students enrolled in Freshman Orientation in the Department of Education at Oklahoma State University in the fall of 1965 along a number of intellectual and non-intellectual dimensions. Certain of these measures were selected to attempt to predict the likelihood of these students completing three semesters' work in the Department of Education.

The study further focused on two of these personality variables which were of particular interest: The Achiever Personality (a measure of the need for academic achievement) and the self concept. The Achiever Personality scale was evaluated in terms of its contribution to the prediction of grade point average over and above ability and the shape of the function relating the Achiever Personality to various aspects of the self concept was investigated.

The results of the study are limited to the population under consideration.

I would like to take this opportunity to express my appreciation to the members of my committee for their assistance and encouragement in the preparation of this dissertation. For their genuine interest and concern, not only in the preparation of the dissertation but also in my total program of study, my most sincere thanks go to Dr. W. P. Ewens, my committee chairman; Dr. John Egermeier, and Dr. Kenneth Sandvold.

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CHAPTER I

THE NATURE OF THE PROBLEM

Introduction

As college populations continue to grow, increased demands are made on institutions of higher learning. The needs and goals of the students have become so diverse that it is becoming increasingly necessary to identify not only characteristics of the academic situation, but also characteristics of the students functioning within a given discipline.

Administrators are understandably concerned about the nature of the student population, particularly those characteristics which contribute to the student's success or failure in the academic area. The faculty who assist the student in developing a course of study and who instruct him in the classroom are equally concerned.

Investigations of academic performance have brought to light a number of problems associated with achievement. They have questioned measures of ability as the unitary relevant requisite as well as the student's grade point average as the sole criterion for progress. As a result of these studies, interest has been generated in characteristics of the students which seem to be associated with performance. Evaluation is a problem of formidable proportions; however, the need for the identification of characteristics associated with achievement is implicit in Hoyt's (1965) statement that improved procedures are dependent on research relating personal characteristics to performance measures.

Purpose of the Study

This study seeks to investigate a number of intellectual and non-intellectual characteristics associated with students enrolled in the Department of Education at Oklahoma State University over a three semester period. In general, it will attempt to identify characteristics of the student which contribute to academic success and then relate these characteristics to various aspects of the self concept.

More specifically, the study will focus on (1) a description along a number of dimensions of the total population of students enrolled in Freshman Orientation in the fall of 1965, (2) an attempt to utilize certain of these dimensions to predict the likelihood of these students completing three semesters college work, (3) whether or not a particular non-intellectual measure makes a contribution to the prediction of achievement over and above ability, and (4) the relationship between this particular non-intellectual factor and various aspects of the self concept.

Need for the Study

Recently writers in the area of curriculum development have been stressing the importance of the student population as a crucial consideration in curriculum planning. Evidence is accumulating which suggests that research efforts need to be directed at identifying the relevant dimensions within the specific population under consideration rather than attempting to discover dimensions which cut across all situations. To the extent that the relevant variables have been identified, one can proceed to estimate the likelihood of these students succeeding in their objectives.

There are a number of existing conditions which indicate the need for a study of this nature, both practical and theoretical. One reason for the increased interest in the prediction of academic performance is the increase in student population and the parallel increase in qualified students, necessitating decisions of admission for those colleges limited in the numbers of students they are able to train. For those colleges not employing a screening method, the student is still faced with increased competition by virtue of the increase in numbers of able students.

Another source of interest in the prediction of academic performance stems from the growth of programs designed to select and support the training of talented students. If the students selected for support do not perform according to expectation, money is wasted and students who might be better risks are rejected.

Paralleling the increase in student population, we have witnessed an increase in types of institutions designed to meet the needs of large numbers of students for whom the university setting is minimally adequate. Among these are the community colleges, the junior colleges and the technical institutes. Logically, then, identification of variables which contribute to attainment of these goals would be valuable to both the institution and to the students.

Further, it would be valuable to the counselor assisting these students to have available to him a number of criteria of demonstrated effectiveness to rely on in assisting the student in the decision making process. To the extent that these variables can be identified, they would be of value for purposes of group counseling as well.

In summary, recent developments indicate the need to develop measures which will maximally predict the likelihood of success in an academic setting. The effort involved is justified on the basis of value to both the institution and to the student.

A number of problems have been encountered from the theoretical point of view. Quite logically, the prediction of academic performance began with an investigation of some measure of ability as a predictor variable. Although the relationship between ability and academic performance is well documented, statistical analysis as well as the dismay of large numbers of parents attest to the fact that tests of ability have been only moderately successful for purposes of prediction. More recently, a host of experimental studies (Lavin, 1965) have been conducted in an effort to predict academic success; however, as research efforts have increased, the realization that such predictions were dependent on a number of variables, many of them not yet identified has become evident.

Efforts aimed at identifying these variables directly without first investigating the relationships between variables may be premature. A more appropriate question would seem to be, "What are the relevant variables related to academic achievement and what is the nature of the relationship between these variables?" A study of this nature should make some contribution to the identification of relevant concepts involved in such prediction and to the nature of the relationship between these factors and other characteristics of the student.

The question has practical implications at all levels of education. The school traditionally has been concerned with learning, and in large measure, academic achievement has been used as the criteria for progress in an academic career as well as a prerequisite for many endeavors outside the academic. Among certain segments of our population, a high level of academic achievement is positively reinforced in the student from an early age.

To the extent that academic achievement is a desired goal, the question arises as to what other behaviors are being learned concomitantly. Is the orientation toward a high level of achievement singularly positive or do some behaviors accompanying this orientation vary along a dimension from positive to negative? It is to problems of this nature that an investigation of the relationship between achievement orientation and the self concept is directed.

In the broadest context, future research efforts hopefully will make a contribution to the prediction of academic success, will discover the relationship between these characteristics and other relevant characteristics of the student, and eventually will identify characteristics of the academic situation and the student which contribute to success beyond the academic experience. The latter goal is in its infancy; the present study is an effort to investigate the first two.

Limitations of the Study

The results of the present study are limited to the group of students enrolled in Freshman Orientation in the fall of 1965 in the Department of Education at Oklahoma State University. Since a cross validation study is beyond the scope of the present investigation,

generalization of the results beyond the original population would be questionable.

Underlying Assumptions of the Study

A major assumption underlying the study is that a limited number of potentially identifiable variables will be associated with academic achievement, here defined as grade point average.

A second major assumption is that a limited number of potentially identifiable variables will be associated with the tendency to complete or not to complete three semesters' work in education.

A third major assumption is that of those students enrolled in Freshman Orientation in the fall of 1965, some will achieve and some will not and this tendency follows a distribution in which the majority of cases cluster around a central mean with frequencies decreasing progressively in either direction from this mean.

A fourth major assumption is that among the original population investigated, some will complete three semesters' work in education and some will not and that the probability of staying or not is equal.

A fifth major assumption is that the variables utilized in this study for predictive purposes (the X variables) are fixed values of random variables; i.e., they do not follow a normal distribution.

A sixth major assumption is that the relationships investigated can be described by a mathematical function such as a line, a curve, a hyperbola, etc.

A seventh major assumption is that all students in the population investigated were exposed to comparable conditions. Such factors as grading criteria and instructional quality are considered as random.

variables in this study.

Definition of Terms

Academic achievement.--A term used to indicate the grade point average the student achieves over a defined period of time unless otherwise specified.

GPA.--Cumulative grade point average over a defined period of time.

OAIS.--The Opinion, Attitude, and Interest Survey, a paper and pencil inventory primarily for twelfth graders and entering college freshmen, designed to measure fairly comprehensive aspects of the normal personality.

Achiever Personality.--A subscale of the OAIS which measures characteristics of the individual other than ability which purportedly contribute to academic achievement; a measure of academic achievement motivation.

MMPI.--The Minnesota Multiphasic Personality Inventory, a multi-dimensional paper and pencil scale intended to measure the relative presence or absence of nine forms of psychological disturbance.

TAT.--Thematic Apperception Test, a projective test in which a person is asked to tell a story suggested by a number of pictures.

Stays.--The group of students enrolled in Freshman Orientation in the Department of Education at Oklahoma State University who completed three semesters' work in the department.

Drops.--The group of students enrolled in Freshman Orientation in the Department of Education at Oklahoma State University who did not complete three semesters' work in the department.

CHAPTER II

BACKGROUND FOR THE PRESENT STUDY

The present chapter includes a discussion of selected studies relevant to the thesis of the investigation and the theoretical framework underlying the rationale. The chapter is concluded with a specific statement of the hypotheses to be tested.

A Review of Related Literature

Introduction

While measures of ability account for 35 to 45% of the variation in academic performance at the high school and college level, over half the variation remains unexplained (Lavin, 1965). In an effort to increase predictive efficiency, a number of personality factors have been investigated as explanatory variables; however, they have usually been selected on the basis of common sense rather than some systematic theoretical point of view.

At the cognitive level are included studies of the self concept and cognitive style. Under personality "style" are included such variables as degree of independence, impulse control and introversion while some studies focus on manifestations of pathology to account for achievement. Some variables, such as anxiety, achievement motivation, and level of interest in different content areas seem to refer to motivational states.

While most of the studies focus on the relationship between a single personality variable and academic achievement, a few multivariate studies have been conducted recently in which a number of variables are considered simultaneously. The present study focuses on two aspects of the general problem: first, the relationship between an achievement orientation and academic achievement as measured by scholastic success; and second, the relationship between an achievement orientation and the self concept. In order to bring the problem of the relationship among personality variables and between personality variables and achievement into clearer focus, a summary of the relevant findings will be presented.

Studies Relevant to Motivational Variables

A number of studies have attempted to investigate the relationship between achievement motivation and academic achievement. Achievement motivation refers to the need of an individual to perform according to a high standard of excellence. Three methods have been used: projective techniques, questionnaires and a combination of the two. Results of these studies indicate that questionnaire measures provide low positive correlations with performance while projective measures are inconsistent (Hills, 1958 and Melikian, 1958). In general, the research does not indicate that achievement motivation, as measured by these instruments, is consistently related to academic performance. Since one would predict a high degree of relationship between these variables, some explanation is in order. The low correlation is due, in part, to the fact that achievement motivation is a multidimensional construct and it should have higher predictive value when the dimensions most relevant to academic performance are specified. Further, there is evidence that

additional variables may operate concurrently as mediating factors to suppress or accentuate its relationship with performance. Further clarification is needed before achievement motivation can be used as a predictor variable.

Fricke (1965) asserts that the Achiever Personality, a subscale of the OAIS, measures a dimension related to academic achievement independent of ability. He reports in the OAIS manual that inclusion of the Achiever Personality variable improves the prediction of grade point average for most groups when combined with ability tests, averaging about 17 percent improvement in variance accounted for. Webb (1965) found the percentage of gain in variance accounted for to be 11.09 in 1962 and 6.74 in 1963 for entering freshmen in the Liberal Arts at Emory University. When controlling for sex, the gain for women was 19.40 in 1962 and 9.09 in 1963, while for men the 1962 increase was 16.81 and the 1963 increase was 25.27.

Fricke (1965) reports the following correlations between the Achiever Personality and a number of inventories as follows:

<u>Positive Correlation</u>		<u>Negative Correlation</u>	
Allport-Vernon-Lindzey Study of Values			
Aesthetic	.11	Economic	-.26
Religious	.19	Political	-.13
Kuder Richardson-Vocational			
Literary	.20	Mechanical	-.18
		Persuasive	-.14
California Psychological Inventory			
Self Control	.37	Sociability	-.22
Good Impression	.29	Social Presence	-.25
Femininity	.28	Self Acceptance	-.27
		Flexibility	-.17

Positive CorrelationNegative Correlation

Guilford-Zimmerman Temperament Survey

Restraint		Social Interest	-.15
Responsibility	.56	General Activity	-.27
Friendliness	.31		
Thoughtfulness	.28		

Edwards Personal Preference Schedule

Order	.19	Affiliation	-.18
Endurance	.36	Change	-.19

Brown-Holtzman

SSHA	.21
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Although the correlations are reported in the manual, Fricke (1965) reports no tests for statistical significance. In addition, since the items making up the scale are not available to the test user, it is impossible to study the scale content for the purpose of making hypotheses. In spite of these drawbacks, Burros (1965) reports that the scale merits further research.

Using interest as a motivational variable, a number of studies have attempted to investigate the relationship between this variable and achievement. Interest measures have been used in an effort to predict grades by measuring either interest in general, interest related to a specific course, or the clarity and intensity of interest. There is some evidence that interest in professional curriculum contributes little to prediction of achievement when ability is controlled, but interest measures are useful for predicting performance in parallel course areas for students in nonspecialized curricula. At the college level, under-achievers have stronger interest in social activities than intellectual activities and the opposite is true of overachievers where ability is controlled. Armstrong (1955) found that for high school students,

underachievers more often chose occupational goals set for them by others and that these goals were not in line with measured interest while Rust and Ryan (1954) present data for Yale students indicating that overachievers in college tend to have high status interests, suggesting that interest measures are a measure of social aspiration level. Lavin (1965) cites four studies indicating that clarity of interest and commitment to a major significantly effects performance for males but not for females. The literature suggests that males are more likely to be motivated by intrinsic interest in a subject area while females are more likely to be motivated by grades. More research is needed to clarify these sex differences.

An assessment of study habits and attitudes has been used in prediction studies with some success. Some studies have utilized pencil and paper inventories and others, peer and teacher ratings. In regard to the inventories, it is unclear whether it is the mechanics of the study habits or the attitude the student brings to scholastic work which is the predictor (Lavin, 1965). Although research is scant, it suggests that teachers are better at rating girls than boys; while male peers do a more effective job in assessing males (Norton, 1959).

The results of the studies involving anxiety are inconclusive in part because many neglected to control for ability. In addition, the results of these studies are questionable due to the fact that the terms are not adequately defined operationally and the results are frequently generalized to situations differing in essential characteristics. In order to deal adequately with the problem of anxiety as it affects achievement, a distinction needs to be made between achievement motivation and achievement anxiety. Further, the literature suggests that the

relationship between anxiety and performance may be curvilinear and this possibility has not been tested (Alpert and Haber, 1960). It is unclear whether anxiety directly exerts an influence on performance or whether both are involved in a feedback relationship. One study suggests that anxiety about peer relationships may effect school performance (Lavin, 1965). It is clear that more work aimed at discovering the dimensions of anxiety is needed.

An attempt to predict performance on the basis of motivational variables is handicapped by lack of comparability of the studies due to differences in measures used, to inadequate definition of terms and boundary conditions, and to failure to utilize adequate controls.

Studies Relevant to Personality Style

Since in an achievement oriented society, adequate adult performance necessitates postponement of immediate gratification in the interest of long term goals, variations in impulse control are expected to relate to attainment of goals. The educational endeavor requires that the individual be able to postpone immediate gratification, and to this extent, measures of impulse control are expected to be associated with academic performance. A number of terms have been used to investigate impulsivity; for example, persistence, endurance, and compulsivity. Merrill and Murphy (1959) found that for a sample of 330 low-ability students, the following scales of the Edwards Personal Preference Schedule differentiated between those who performed adequately and those who did not at the college level: overachievers were more dominant, less autonomous (.01 level), more deferent, less exhibitionistic, less affiliative, less concerned about change and more enduring (.05 level).

The same results were found by Weigand (1957) in discriminating successful from unsuccessful students on probation. It is difficult to tell the difference between endurance and compulsivity by objective measures. A differential assessment would probably require psychodynamic measures. Two studies by Fredriksen (1954, 1960) indicate that interest test scores may be better predictors of academic performance for noncompulsive than for compulsive students. The accounting scale of the Strong Vocational Interest Blank was used as a measure of compulsivity. Engineering students were divided into compulsive and noncompulsive on the basis of this subscale and it was found that interest measures correlated more highly with grades for the noncompulsive students; however, ability was not controlled. It has not been determined whether impulse control is independent or related to other variables such as achievement motivation.

Some studies have attempted to determine the relationship between introversion and achievement. The term "introversion" refers to a tendency to turn energy inward upon the self rather than toward sociability and the seeking of social contacts. At the college level, small positive correlations have been found between introversion and academic performance (Travers, 1949, Bloomberg, 1955, and Kerns, 1957). However, the theoretical significance is not clear. If introversion is a function of the value placed on academic work, it should correlate with independence. On the other hand, it is possible that academic achievement may be a defense against felt inadequacies in the social context. Further research is needed to clarify the nature of this relationship.

The research indicates that independence tends to be positively related to academic performance but may be part of a larger constellation

of variables that define a general achievement orientation. However, important sex differences have been suggested. Erb (1961) using 100 of the original 600 entering freshmen at East Texas State College found that conformity (defined as conformity to the perception of the group) for males was unrelated to grade point average, while for females conformity was positively related.

In investigating the relationship between aggression and academic achievement, Bresee (1957) found that for high school students, the greater the hostility and extrapunitiveness, the lower the level of achievement, but he did not adequately control for ability. Stoner (1957) found that the low achievers in a group of bright high school males were more defensive and resentful than the high achievers. Shaw and Grubb (1958) observed that highly intelligent, low-achieving male high school students scored significantly higher than their achieving counterparts on three measures of hostility. The literature indicates that high ability students may use refusal to achieve as a passive expression of aggression.

Bower's work (1960) suggests that high achievement at the elementary level may be associated with intropunitiveness. Coppersmith (1959) found similar results when he compared a group of high esteem children whose teachers thought poorly of them with a group of children who thought poorly of themselves but who were highly regarded by their teachers. Results indicated that the children who were successful but were regarded poorly by themselves were more popular and better academic achievers although more self critical and more ambitious. The children appeared to be "taking it out on themselves".

These studies seem to suggest that the direction of hostility is differentially related to scholastic performance. While intro-punitiveness may be associated with a high level of achievement, passive aggression towards others may take the form of refusal to perform.

Most of the studies attempting to relate measures of adjustment to academic performance have used the MMPI subscales or inventories derived from the total scale. On a derived scale, Hackett (1960) attempted to determine whether or not high and low achieving male students tended to make different self reports about themselves. The initial data consisted of MMPI records of 32 male freshmen students entering the spring quarter. At the end of the quarter, grade point averages were computed and the group was ranked according to their achievement. Results indicated that low achievers were emotionally labile, defensive about revealing weaknesses, admired strength and power, and lacked warmth and acceptance of others. The high achieving group appeared to be more interested in verbal activities, to project less, to discriminate better and to live a more relaxed, confident tempo.

Jensen (1958) in a study of 458 students entering Brigham Young University, found that for a low ability group, low achievers were higher on schizophrenia, hypomania and fake scales than achievers. The studies indicate that more often than not, the MMPI scales are unrelated to academic performance. However, as the study by Hoyt and Norman (1954) suggests, for a sample of freshmen men, the presence of some type of maladjustment, as indicated by profile analysis is likely to be associated with differences in achievement even though no relationship is found between achievement and the particular scales. Further research in this area is warranted.

Studies Relevant to the Cognitive Level

Recently some basic research has accumulated directed at an investigation of the relationship between self and academic performance. These studies are primarily concerned with the positive or negative aspects of the self image. Brim (1954) investigated the relationship between individual self-estimates of intellectual rank and academic performance as measured by grade point average. 103 students in an advanced social psychology course at the University of Wisconsin were asked to estimate their rank from high to low on general intelligence. These estimates were checked against the individual's score on the American Council Psychological Examination. Cumulative grade point averages were gathered and the relationship of both actual and estimated intellectual rank to grade point average was calculated. A small but significant correlation of .32 was found. When actual intelligence was controlled, the correlation dropped to .20, slightly below the .05 level of significance.

Lum (1960) in an analysis of the subtests of the Survey of Study Habits and Attitudes by Brown and Holtzman, found that overachievers obtained a significantly higher score on Achievement Drive and Self-confidence than underachievers. His subjects were females, mostly oriental, from two classes of introductory psychology at the University of Hawaii.

Stevens (1956), using a group of 52 college sophomores on the honor roll and 49 college sophomores put on probation because of poor grades, investigated the relationship between self-image and academic performance. All subjects scored above the 75% on the Henmon-Nelson Test of Mental Ability. He found that high achievers exhibited greater self

insight in regard to their intellectual ability, and showed a greater positive attitude toward themselves in terms of self-insight, self acceptance and salience of personality traits associated with achievement. This study suggests that underachievement is associated with an internalization of rejection rather than external rejection of authority as suggested by a number of studies.

At the high school level, Shaw, Edson, and Bell (1960) used a 200-item adjective checklist to investigate the self image of highly intelligent students who differed in level of achievement. Subjects used in the study were juniors and seniors selected on the basis of their performance on the Primary Mental Abilities test. No student was used whose IQ was below 113 on the measure. The final group consisted of 20 male and 21 female achievers and 19 male and 27 female underachievers. An achiever was defined as a subject with a cumulative grade point average of 2.00 or above while an underachiever was defined as a student whose cumulative grade point average since entering high school was 1.75 or below. For the boys, thirteen adjectives discriminated and these tended to be related to academic work. For boys, a higher achievement level was associated with a more positive self image. For girls, a higher achievement level was not related to a more positive self image and the seventeen adjectives which discriminated were less relevant to academic work.

The effect of positive (approval) and negative (disapproval) social reinforcement on the individual's level of self-evaluation was investigated in a sample of 79 junior and senior high school boys in a small community by McDavid (1959). Over and underachievers were identified and differences between these groups on the Situational Interpretation

Test were found to be highly significant. Although McDavid failed to control adequately for intelligence, the study is of interest because it suggests that overachieving males may be more highly motivated by the positive evaluation of teachers than underachievers. Schroder and Hunt (1957) were interested in the individual's perception of a situation (a subjective situation in Rotter's system) as opposed to objectively observed or evaluated behavior, as an important determinant of behavior. They investigated the relationship between failure-avoidant interpretation (the tendency for the individual to avoid making self-negative interpretations) and self-evaluation following criticism or failure. Results indicated that avoidant interpreters tended to maintain their self-evaluation after criticism, primarily by the use of defensive interpretations. While self-esteem was preserved in this way, selection of an alternative solution was unavailable. In addition to maintaining self-evaluation after criticism, subjects who made avoidant interpretations of failure and criticism also tended to avoid failure in a problem-solving situation, to state higher evaluations following a low "failing" score, and to overevaluate their performance.

Further research is needed to map the relationship between the self image and other variables. Martire (1956) obtained TAT measures of achievement motivation for 53 graduate and undergraduate volunteers under both neutral and achievement-motivating conditions. He found that the higher the achievement motivation, the greater the discrepancy between what a subject wishes he were like and what he thinks he is like, suggesting an indirect relationship between self image and performance. Following this line of thinking, one might conclude that the quality of the self concept which is associated with high achievement is at the

same time associated with a less desirable perception of one's self.

Investigating the relationship between cognitive "style" and achievement, Field (1954) utilized a 100 item Q-sort with 125 males who had graduated from college. He found that the high achievers made significantly higher scores on Inquiring Intellect, Conformity and Confident Self Expression than the low achievers. A study by Gulliksen (1954) suggests that the ability to make consistent judgments in paired comparison choices is related to academic performance. Consistency of judgment was measured by the number of circular triads; the fewer the triads, the more consistent the subject. Two measures were used on two college samples and the results of both samples indicated that the relation between response consistency and grades is curvilinear. The best grades were made by those in the 75th to 80th percentile of consistency. A common sense interpretation would be that students who are very consistent are somewhat rigid and inflexible and, hence, less able to deal with ambiguities in intellectual matters while subjects who are quite inconsistent are not intellectually systematic enough to organize the material they must deal with as students.

Although the literature, in general, suggests that a positive self image is associated with higher performance, the studies raise a number of issues requiring further investigation. It is first of all unlikely that the self image is directly related to performance. It is probably acquired in social situations and helps to determine the course of future experience along with a number of other variables. Just how these variables are related has not been determined. Nor has the shape of the function been dealt with adequately. Where statistical procedures assuming linearity are used, the possibility of other types of functions is

not considered.

The stability of the self concept has not yet been investigated. In order to treat adequately the problem of stability as well as causal relationships, it would be necessary to do longitudinal studies since the self concept may be highly sensitive to prior experience.

The lack of comparability of different operational procedures makes comparison of the results of the studies difficult. Some studies assess self image by computing discrepancies between ideal and actual evaluations while other studies ask the subject to check whether certain qualities apply to him or to what extent he likes himself. The problem is further complicated by the fact that the self as a concept is multi-dimensional rather than unidimensional so that even when identical operational procedures are used, it is necessary to identify which aspect of the self concept is being measured. The reader is referred to Wylie (1961) for a thorough evaluation of self concept studies and a discussion of the problems encountered in its measurement.

Another problem involves the consistency of the self concept across social situations, that is, the extent to which the self concept varies or remains the same from one situation to another.

Multivariate Studies

More recently, the trend in research efforts has been toward a multivariate approach. Attention is directed to the measurement of a large number of variables, to the assessment of their interrelations, and to the discovery of those dimensions of personality that are independently related to academic achievement.

Demos and Ludwig (1961) found no difference between different

achievement groups within different ability levels on the Edwards Personal Preference Schedule at the college level. Using the same instrument, however, Krug (1962) indicated that overachievers were higher on needs for achievement, order, and endurance, but were lower on needs for affiliation and heterosexuality. Merrill and Murphy (1959) found that low ability students whose school performance was adequate were higher on needs for deference, endurance, and dominance but lower on autonomy, exhibitionism, and affiliation as compared with low-ability students who were failing. Gebhart and Hoyt (1958) found that overachieving male freshmen were higher on needs for achievement, order, intraception and consistency but were lower on needs for nurturance, affiliation, and change. The findings from the three studies suggest a pattern; all three found that overachievers are lower on need for affiliation and two report that overachievers are higher on need for achievement, order and endurance.

Holland (1959) using the California Psychological Inventory and an aptitude inventory with high ability college freshmen found the best predictor battery for men included the math score from the aptitude test and the personality scores on socialization, social presence and femininity. For women the best battery included verbal aptitude and social presence, responsibility, achievement via conformance and femininity.

Holland (1965) intercorrelated several academic achievement tests, extra curricular achievements, and average school grades for 7,262 college freshmen attending twenty-four universities. Results indicated that academic and non-academic accomplishments are relatively independent measures of talent. The most notable finding was the low magnitude of the correlations between academic performance and artistic, scientific

and social accomplishment.

Brown (1960) studied a group of college girls nominated by faculty members as outstanding students. Not all the girls had high grades but 57% had A averages. Compared to girls who had high grades but were not nominated, the nominated girls were characterized by a high degree of social maturity, moderate impulse expression and low repression. Further, they were low on conformity and on degree of integration with the student peer culture.

Mitchell (1959) investigated goal-setting behavior as a function of self-acceptance, over- and underachievement, and a number of related personality variables. His subjects were 100 female college students majoring in elementary and secondary education, either freshmen or sophomores at the University of Texas. The investigator asked subjects to estimate their grades on three tests in addition to the course grade. Discrepancies between actual and expected grades were calculated. A measure of self-acceptance was determined using Bills' Index of Adjustment and Values along with a number of items from the Taylor Manifest Anxiety Scale and the MMPI. Measures of over- and underachievement were determined using ACE scores. Patterns of goal-setting behavior were analyzed for four groups: self-acceptant overachievers, self-acceptant underachievers, self-rejecting overachievers, and self-rejecting underachievers.

Results indicated that self-rejecting subjects had significantly smaller discrepancies between past performance and present level of aspiration; self-rejecting subjects tended to exceed their expected grades while the self-acceptant consistently overestimated theirs. The self-acceptant underachiever led all four groups in gross overestimation,

while the self-rejectant overachievers led the others in achieving or exceeding their expected grades. In terms of mental health, the self-rejecting overachievers seem to present the most depressing picture, even though they achieve or exceed expected success in course grades.

A large number of perceptual, cognitive, and personality factors were investigated by Stern, Stein and Bloom (1956) in order to investigate variables relevant to achievement at the college level. The sample was atypical when compared to most college populations in that the average standing for entering classes for several years preceding the study had been consistently above the 90th percentile on national norms for college freshmen. In addition, these students were entering college at about the sixteenth year after completing ten years of schooling. The criterion consisted of grade averages based on comprehensive examinations administered and scored by an independent staff of examiners at the end of each academic year.

Results of the study indicated that a space factor, one isolated by Thurstone involving the "ability to visualize a rigid configuration when moved into different positions" correlated .47 with grade average, a correlation significant at the .01 level.

The strongest contributors to academic performance were two measures of participation in the classroom: one, relevant thinking or covert participation as inferred from simulated recall data (r of .61) and two, overt participation as judged by the instructor in terms of quality (r of .67). Both correlations are significant beyond the .001 level. These two types of participation are quite independent and one cannot be adequately predicted from the other. Together, they yield a multiple correlation of .86 thus constituting the major factors relative to

academic achievement.

A large number of personality variables were investigated to determine their relationship to academic achievement. High achievers were defined as those students achieving a 3.2 grade average or above, low achievers a 1.8 grade average or below. Analysis of the needs index indicated that the area yielding the largest differences between the two groups was that involving impulse acceptance. It appeared that the low achievers were more free to express their interests in heterosexual and social activities considered appropriate for a group of sixteen-year-olds, whereas the high achievers were somewhat more restrained in these areas. The authors suggest that this may signify an earlier maturity for the high achievers, or a retarded psychosexual development and compensatory intellectualization similar to the one found by the writers for physics students.

The investigators then defined two contrasting types of personalities: the stereopathic and nonsteropathic. The hypothetical stereopaths (S-syndrome) were characterized as having depersonalized and codified social relationships, accepting authority as absolute, and inhibiting and denying their impulses. They demonstrated rigid orderliness and tended to be highly conforming in their behavior. The nonstereopaths (N-syndrome) were conceptualized as having highly personalized and individualized social relationships, prevasively rejecting authority figures, and spontaneously accepting their impulse life. They were seen as demonstrating a non-conforming flexibility in their behavior. Having defined the hypothetical stereotype and nonstereotype in lengthy clinical terms, an instrument called The Inventory of Beliefs was developed to identify representatives of these two personality types. This

instrument was administered to two groups of entrants to the college. Stereopathic and nonstereopathic groups were identified and the S and N groups were then matched on ability. Results indicated that stereopaths performed less well than nonstereopaths in the social sciences and humanities; they made poorer adjustments to college, and they tended to choose vocations such as accounting and law (Stern, Stein and Bloom, 1956).

Using more than 20 ability, interest, personality and temperament measures, Stone (1958) found that for male college seniors in the physical sciences, the addition of personality factors more than doubled the efficiency of prediction over ability measures alone.

In an effort to investigate motivational variables, Michael, Jones and Trembly (1959) found through factor analysis that academic performance had very low relationships with motivational factors--mainly a "freedom from a neurotic orientation to study tasks" factor. The findings of this study are similar to the single variable studies investigating motivation.

So far neither longitudinal nor cross sectional studies have been conducted across elementary, junior high and high school groups. However, a consideration of the studies which have been done suggests the relationship of achievement and nonintellective factors merits further research. d'Heurle, Mellinger, and Haggard (1959) attempted to assess both level and patterns of achievement in gifted third grade children. They found that high achievement in arithmetic tended to be related to the ability to get along with adults, to creativity, and to skill in symbol manipulation, while high reading achievers were more withdrawn and insecure with adults. High spelling achievers were more

passive, dependent on authority and less creative. The students demonstrating a high level of general achievement tended to be better adjusted, were able to express hostility in culturally approved ways, were sensitive to and accepting of adult standards, had good work habits and were persistent.

At the junior high level, McGuire (1961) and associates utilized forty-one measures of ability, personality, and social behavior in a factor analysis multiple correlation with seventh graders at four schools. The measures which had appreciable relations with academic performance across sex and schools were measures of peer acceptance and social effectiveness and a measure of motivation and attitudes toward school. Bishton (1958) found that at the junior high level only a general achievement factor characterized by high ability, high socioeconomic status, male sex, and self-preoccupation was related to high academic performance of a group of intellectually superior boys and girls.

Nason (1958) attempted to identify factors related to achievement of gifted students at the high school level. Controlling for sex and intelligence, he found that the high achievers had higher scores on measures of "sense of personal freedom" and "freedom from nervous symptoms". High achieving girls were higher on social adjustment and high achieving boys reported that their parents expected them to attend college.

Summary of the Review of Related Literature

In order to obtain some sense of order out of the many different kinds of measures and concepts used in the multivariate studies, Lavin (1965) performed what might be considered an intuitive factor analysis

identifying possible underlying dimensions. Then those variables found to be associated with academic performance were classified according to the underlying dimensions. He attempted to relate the findings of the single variable studies to the underlying structure. The six underlying dimensions identified were social maturity in the student role, emotional stability, achievement motivation syndrome, cognitive style, achievement via conformance and achievement via independence. In Table I the dimensions are listed and variables associated with high academic performance from both the single variable and the multivariate studies are related to the dimensions.

At the present time, it would be erroneous to conclude that a definitive picture of the achiever personality can be drawn. The relationships between personality variables and between these variables and achievement are so tenuous that they cannot be used at the present time for practical purposes in a general sense. The studies reviewed here demonstrate the relationships to be quite weak and the findings often inconsistent. However, it would be premature to conclude that personality variables are not useful as predictors.

Two major considerations emerge as possible explanations for the disappointing state of affairs. First, one of the major difficulties encountered in research with personality variables is the lack of unidimensionality of the concepts. This is especially true of such motivational variables as achievement motivation and anxiety. The same problem exists in attempting to investigate the self concept. This suggests that more discrete measures need to be utilized, that is, measures for which the conceptual and operational definitions are more congruent. The studies reviewed are largely incomparable due to the

TABLE I

CLASSIFICATION OF FACTORS RELATED TO ACADEMIC ACHIEVEMENT IN RELATION TO UNDERLYING DIMENSIONS

<u>Dimension</u>	<u>Alignment of Factors from Multivariate Studies</u>	<u>Alignment of Factors from Single Variable Studies</u>
I. Social Maturity in the Student Role	Greater social presence Responsibility Greater social maturity Greater socialization Restraint in social behavior	Better study habits and more positive attitudes toward school Less hostility
II. Emotional Stability	Higher morale Greater stability Greater freedom from neurotic orientation to study	Less test anxiety
III. Achievement Motivation Syndrome	Higher achievement motivation Higher activity level More endurance	Higher achievement motivation
IV. Cognitive Style	Greater curiosity Greater flexibility Greater originality Greater ability to visualize a configuration when moved More relevant thinking in class More class participation (quality and frequency) Greater liking for thinking Less stereopathy	Greater flexibility in problem-solving

TABLE I (Continued)

<u>Dimension</u>	<u>Alignment of Factors from Multivariate Studies</u>	<u>Alignment of Factors from Single Variable Studies</u>
V. Achievement via Con- formance	Higher need for order Greater femininity Higher conformance	----
VI. Achievement via Independence	Lower need for affiliation Greater independence Low conformity to peer group standards Moderate impulsivity (lack of constrictedness)	More independence and/or intro- version Less impulsivity Greater independence in choice of vocational interests

Nonaligned Findings from Single
Variable Studies

More positive self image
Less defensiveness about revealing
personal inadequacy
Greater interest in content areas
of high achievement

diversity of instruments used to measure these inadequately defined constructs.

Further, there is a need to establish the relationships between personality variables. Since this problem is largely uninvestigated, in many cases it is difficult to tell whether personality variables exert a direct influence or whether they are involved in an interaction effect with other variables or as feedback mechanisms.

The second consideration speaks to the problem of lack of generality. That the findings tend to be weak and inconsistent may indicate that the social context (the situation) in which performance takes place may itself be a critical variable which must be conceptualized and used as a relevant variable.

Stern, Stein and Bloom (1956) in their need-press conceptualization have made an effort in this direction. However, for use in college settings it would be necessary to define the press aspect (social context) more explicitly. Within any given institution, the administration may constitute a different press from the faculty. Differing groups to which the student belongs may constitute additional presses. Thus, there is the relationship of student to student, student to teacher, and student to administration, any or all of which may affect academic performance. Here the effect of such conflict upon the academic performance of students with differing personality characteristics needs to be assessed. It is very likely that the failure to include the social context as a relevant variable accounts for the fact that certain personality characteristics have been found to be good predictors at some schools but not at others.

In spite of the difficulties encountered, a review of the studies

does indicate the direction that future research should take and points to a number of testable hypotheses. The next section presents a theoretical framework within which the personality variables used in this study are conceptualized and the rationale underlying the hypotheses to be tested.

Theoretical Background

The present study follows from the general theoretical framework of Rotter's (1954) Social Learning Theory. Rotter proposes that the basic unit of personality study is the interaction of the individual with his meaningful environment. The most important aspect of the human organism is a function of his interaction with other people. Behavior is goal directed, and these goals are contained within other people.

Rotter has developed a behavior-reinforcement learning sequence for the prediction of behavior and from this formula a more generalized formula for the study of personality. Four major constructs are utilized in the learning model: behavior potential, expectancy, reinforcement value and the situation. The basic formula states that "behavior potential in a given situation is a function of expectancy and reinforcement value" (1954, p. 165).

Rotter defines behavior potential as "the potentiality of any behavior's occurring in any given situation or situations as calculated in relation to any single reinforcement or set of reinforcements" (1954, p. 105).

Expectancy is defined as "the probability held by the individual that a particular reinforcement will occur as a function of a specific behavior on his part in a specific situation or situations" (1954, p. 107).

This construct includes both internal and external probability; however, from this point of view, internal (subjective) probability is the major intervening variable, the one most likely to change as a result of new experience. The construct utilizes both expectancy built up as a function of past experience and generalized to the present situation as well as situations in which there is no history of reinforcement for the behavior under study.

It is with this construct that the present study is primarily concerned. Both the Achiever Personality and the Self Concept are seen as contributing to Expectancy in the prediction of behavior. The Achiever Personality refers to characteristics of the individual other than measured ability which are related to academic performance and is operationally defined as the subscore obtained on the Achiever Personality of the OASIS Inventory. The Self Concept is defined after Rogers (1951) as "an organized configuration of perceptions of the self which are admissible to awareness" and is operationally defined as the scores obtained on the Tennessee Self Concept Scale.

Before the relationship of the self concept to academic achievement is investigated directly, it seems theoretically reasonable to investigate the nature of the relationship between the self concept and an achievement orientation. It seems logically possible that the individual's concept of his ability or competence influences the extent to which he will strive to achieve. It is not unlikely that these two variables interact in a variety of ways. In this event, the interaction effect would have varying implications for the total personality development of the individual. It is hopeful that this sort of investigation will lend itself to a clarification of some of the inconsistencies found

in the studies.

Reinforcement value is defined as "the degree of preference for any reinforcement to occur if the possibilities of their occurring were all equal" (1954, p. 107). Reinforcement value, like behavior potential, is calculated in a choice situation and the obtained measure of reinforcement value is relative to other known alternative reinforcements. The value of any reinforcement is a function of the reinforcements the behavior has been paired with, or has led to, or is perceived as leading to, from previous experience. Although reinforcement values may be measured in preference situations, they may also be predicted from previous experience.

The situation is the variable included to handle the meaningful environment referred to in the first postulate which states that "The unit of investigation for the study of personality is the interaction of the individual and his meaningful environment" (1954, p. 85). By meaningful environment is meant the psychological situation made up of both subjective and objective characteristics. Social learning theory proposes that situations be described "by their cultural meanings in terms of the characteristic reinforcements that are likely to occur in those situations" (1954, p. 202). At the same time, it does not assume that the individual classifies situations in the same way as the majority of the culture or that the situations the individual is likely to see as similar are the same ones likely to be seen as similar by the culture.

The situation enters the basic formula in that

The individual's expectancy that a given behavior will be followed by a given reinforcement is dependent upon how he characterizes the situation (1954, p. 204).

Stated briefly, the likelihood of a behavior occurring in a given

situation is a function of the probability held by the individual that reinforcement will follow this behavior and the value that the reinforcement has for the individual. Rotter's major contribution thus far is the functional relationship among the four constructs which allows prediction from the specific to the general. In its most complex form, the formula reads:

The potentiality of the functionally related behaviors x to n to occur in the specified situations 1 to n in relation to potential reinforcements a to n is a function of the expectancies of these behaviors leading to these reinforcements in these situations and the value of these reinforcements (1954, p. 110).

This formulation is concerned with specific behavior-reinforcement sequences and is used primarily for testing hypotheses regarding the principles of the theory. Needs develop out of this functional relationship. From the basic formulation are derived the broader constructs of need potential, freedom of movement and need value which are the important variables referred to as psychological needs, the variables of interest in the study of personality. According to social learning theory, behavior is goal directed; an individual responds with those behaviors that he has learned will lead to the greatest satisfaction in a given situation.

Need potential refers to a set of behaviors directed toward the same goal (or to similar or related ones), for example, the set of behaviors the individual uses to attain a high level of academic performance. The term refers to the potential strength of these behaviors, that is, the likelihood that they will be used in certain situations.

The second component, freedom of movement is defined as "the average level of the expectations that the behaviors one has learned to rely upon to achieve certain satisfactions will actually lead to those

satisfactions" (1964, p. 57). For example, the college student may have used acting interested and conforming behaviors for getting good grades at the elementary level but find that these behaviors are related to a lesser extent at the college level. He may also have learned that in college, academic achievement is highly associated with the behaviors of studying a given amount of time, reading the material critically and going to the library. Freedom of movement refers to the mean expectancy that the individual has developed that these behaviors will result in high achievement.

The third general component of needs is the value attached to the goals themselves. Need value is defined as "the degree to which an individual prefers one set of satisfactions to another" (1964, p. 57). It develops from a functionally related set of reinforcements. College students are confronted with a host of choices in their daily lives. One common example is the choice between studying for a test on a given evening versus going to the movie with a group of friends. The behavior that occurs will depend in part on the satisfaction the individual gets out of making a good grade versus the satisfaction obtained by engaging in social activity.

Rotter (1964, p. 59) lists six very broad needs which attempt to include most learned psychological behavior. These are:

Recognition-Status: The need to excel, to be considered competent, good or better than others in school, occupation, profession, athletics, social position, physical appeal, or play. That is, the need to obtain high position in a socially valued competitive scale.

Dominance: The need to control the actions of other people, including family and friends; to be in a position of power, to have others follow one's own ideas and desires.

Independence: The need to make one's own decisions, to rely on oneself, to develop the skills necessary to obtain

satisfaction and reach goals without the help others.

Protection-Dependency: The need to have another person or persons prevent frustration, provide protection and security, and help obtain other desired goals.

Love and Affection: The need for acceptance and liking by other people, to have their warm regard, interest, concern, and devotion.

Physical Comfort: The need for physical satisfactions that have become associated with security and a state of well-being, the avoidance of pain and the desire for bodily pleasures.

These terms are so broad that for purposes of explanation and prediction they are broken down to more specific levels. Obviously, the need to excel in school, profession and athletics refers to different constellations of behaviors.

It is assumed that the individual possesses a complex of needs. Although these needs can be arranged in a hierarchy, adequate personality development requires a balanced satisfaction of the individual's need system. To the extent that one need is satisfied to the exclusion of other felt needs, the individual will very likely experience some maladjustment.

The psychological situation is of crucial importance both in understanding and predicting behavior. The individual not only learns through experience that some satisfactions are more likely in some situations than in others, but social learning theory recognizes the fact that individual differences exist not only in the strength of the different needs but also in the way the same situation is perceived. Past experience constitutes an important part of individual differences. The psychological situation provides the cues for a person's expectancies that his behaviors will lead to desired outcomes.

Rotter's (1954) broader formulation includes the concept of minimal goal level. In considering the potential outcomes of a series of alternative behaviors in a given situation, it is possible to place these outcomes or external reinforcements on a continuum in terms of preference. Some of these outcomes will be experienced by the individual as satisfactions, some as punishments or failure. The minimum goal level is "the lowest goal in a continuum of potential reinforcements for some life situation or situations which will be perceived as a satisfaction" (1954, p. 213). For example, one child may be elated with a grade of D while another considers himself a failure unless he can obtain an A in every course. In understanding and predicting behavior, it is necessary to determine not only what goals are important to the individual, but also the lowest level of attainment which is perceived as satisfaction rather than as punishment.

In summary, the broader formulation which is used in most applied endeavors states that "the potentiality of a given behavior or set of behaviors to occur in some specific situation is dependent on an individual's expectancy that the behavior will lead to a particular goal or satisfaction, the value that the satisfaction has for him, and the relative strength of other behavior potentials in the same situation" (Rotter, 1964, p. 59).

Consideration of the theoretical framework and the studies reported in this study suggests a number of directives. It would seem that a measure of achievement orientation related specifically to academic achievement is needed rather than a general achievement orientation. Discrete measures of various aspects of the self concept are also needed. There is a strong suggestion that the situation within which this

orientation exists needs to be defined. It is further suggested that the effect of the achiever personality on performance may be influenced by other variables and that these relationships need to be investigated.

In particular, it is suggested that differing levels of the achiever personality are related differentially to the self concept. To the extent that the individual is motivated toward academic achievement to the exclusion of other needs, it follows that those students possessing a very high need for such achievement would have self-perceptions in a number of areas which are lower than those possessing a moderate need for achievement. Since in our society achievement is strongly rewarded, and particularly school achievement within the school situation context, a very low need for achievement would be expected to be related to lower self-perceptions in a number of areas. This suggests that the relationship between the self concept and the achiever personality may be curvilinear. That is, either very high or very low needs for academic achievement are likely to be associated with lower levels of the self concept than those falling in a moderate range. Individual's with the strongest self concept are likely to be those falling at neither extreme in their need for academic achievement.

Specific Statement of Hypotheses

1. The OAIS combined with ability makes no improvement in the prediction of the likelihood of the student completing three semesters in the Department of Education at Oklahoma State University over chance. (More specifically, the ACT score combined with the following subscales of the OAIS makes no improvement in the prediction of the likelihood of the student completing three semesters in the Department of Education

at Oklahoma State University over chance: Positive Response Set, Infrequent Response, Social Undesirability, Achiever Personality, Intellectual Quality, Creative Personality, Social Adjustment, Emotional Adjustment and Masculine Orientation.

2. The Achiever Personality as measured by this subscale of the OAIS makes no contribution to the prediction of GPA over and above ability.

3. The quadratic form of the function relating the Achiever Personality to aspects of the self concept, the empirical scales, ability and grade point average makes no improvement over a linear function.

More specifically, the quadratic form of the function relating the Achiever Personality to the following variables makes no improvement over a linear function:

- | | |
|-----------------------|----------------------------|
| a. Self Esteem | k. Defensive Positive |
| b. Identity | l. General Maladjustment |
| c. Self Satisfaction | m. Psychosis |
| d. Behavior | n. Personality Disorder |
| e. Physical Self | o. Neurosis |
| f. Moral Ethical Self | p. Personality Integration |
| g. Personal Self | q. Number of Deviant Signs |
| h. Family Self | r. ACT score |
| i. Social Self | s. Grade Point Average |
| j. Self Criticism | |

The terms used in the hypotheses are fully described in Chapter III under Measuring Instruments.

CHAPTER III

DESIGN AND METHODOLOGY

Introduction

This chapter presents a description of the subjects employed in the investigation and the instruments used to measure characteristics of the students presumed to be associated with the relationships investigated. The method is then presented followed by a description of the statistical procedures employed for testing the hypotheses as stated in Chapter II.

Subjects

Subjects for the study included the total population (348) of freshmen students enrolled in Freshman Orientation in the Department of Education at Oklahoma State University in the fall of 1965. For purposes of this investigation the total population is divided into two categories: (1) those who completed three semesters' work in the Department of Education (Stays) and those who did not (Drops), and (2) males and females. Of the original 348 students, 137 females stayed and 144 dropped making a total of 281 females. The original population included 27 males who stayed and 40 males who dropped making a total of 67 males.

Table II indicates the breakdown of the total population in terms of those who dropped and those who stayed according to sex.

TABLE II
TOTAL POPULATION CLASSIFIED IN TERMS OF
DROPS AND STAYS ACCORDING TO SEX

Sex	Stay	Drop	Total
Male	27	40	67
Female	<u>137</u>	<u>144</u>	<u>281</u>
Total	164	184	348

Observation of Table II demonstrates the preponderance of female subjects in the population under consideration. Since results of a number of the studies reviewed in Chapter II were contaminated by failure to control for this variable, it was considered advisable to treat the groups separately for purposes of analysis. Due to the small number of male subjects, it is not unlikely that more confidence can be placed in the results of the analysis for females than for males.

Of the 164 students who completed three semesters' work, 145 volunteered to participate in an additional part of the investigation. This group consisted of 120 females and 25 males.

Measuring Instruments

The present study utilized three measuring instruments: The Opinion, Attitude, and Interest Survey (OAIS, Fricke, 1965), the Tennessee Self Concept Scale (Fitts, 1965), and the American College Testing Program Test (ACT, 1962).

The OAIS is an instrument devised by Benno G. Fricke (1965) primarily for college-bound twelfth graders and for entering college freshmen.

It is an empirically derived test designed to measure fairly comprehensive aspects of the normal personality. It is a multidimensional inventory which yields a total of 14 scores from true-false responses to 396 self-descriptive and attitudinal items.

The OAIS includes three academic promise scales: the Achiever Personality scale (Ach. P., 86 items), an Intellectual Quality scale (Int. Q., 85 items), and the Creative Personality scale (Cre. P., 101 items). The Achiever Personality scale measures attributes associated with the traditional criterion of academic success, grades. Scores from the Ach. P. scale do not correlate with scores from ability tests; but students who score high on the scale tend to achieve high grade-point averages in college. The present study seeks to determine whether or not the Achiever Personality makes a contribution to the prediction of GPA and to investigate the relationship between this scale and the self concept.

The Intellectual Quality scale measures personality attributes associated with intelligent behavior and an intellectual orientation. Students who obtain high scores on the Int. Q. scale tend to score high on tests of verbal aptitude and intelligence and they also obtain above average grades.

The Creative Personality scale measures attributes associated with creative behavior. Students who score high on the Cre. P. scale tend to show the greatest imagination and originality in their thinking and the highest capacity for reorganizing ideas.

The three psychological adjustment scales measured by the OAIS (Fricke, 1965) are the Social Adjustment scale (Soc. A., 91 items), the Emotional Adjustment scale (Emo. A., 91 items) and the Masculine

Orientation scale (Mas. O., 96 items). The Social Adjustment scale measures characteristics associated with the layman's conception of a "nice" personality. Students who score high on the Soc. A. scale tend to get along well with others and be well-liked by their classmates.

The Emotional Adjustment scale measures characteristics of personality associated with feelings of security, optimism, personal worth, and calmness. Students scoring low on the Emo. A. scale are judged by counselors to be anxious, hypersensitive, nervous and in need of personal-emotional counseling.

High scores on the Masculine Orientation scale indicate responses given more typically by men while low scores indicate responses more typically given by women. In describing these first six subscales, high scores are considered to be percentiles of 80 and above, low scores are defined as percentiles below 20, and average refers to percentiles between 20 and 80.

The five educational-vocational scales assess the extent to which the student has personality traits, characteristics, and values similar to those who enter the five educational vocational areas. These areas are (1) business and commerce, (2) humanities, (3) social and behavioral sciences, (4) physical sciences, engineering and mathematics, and (5) biological and health sciences, and agriculture.

On the interest scales, a high score is defined as a percentile of 50 and above. Such scores are obtained by half the students who concentrate or specialize in each interest area. Since a substantial number of students concentrate in an area for reasons other than genuine interest, percentiles below 40 do not constitute good evidence for interest in the area. Percentiles below 20 are defined as low and

usually can be interpreted as good evidence against interest in an area.

The OAIS includes three response bias scales which provide information on how the student behaved on the test. The Set for True (Set. T., 83 items) measures the student's tendency to answer "True", to acquiesce to statements of opinion, attitude, and interest, perhaps with inadequate attention to their content. The Infrequent Response scale (Inf. R., 93 items) measures a student's tendency to give atypical or infrequently given responses. Students scoring high on the Inf. R. scale have marked many answers which are usually not marked by many students. The Social Undesirability scale (Soc. U., 87 items) measures a student's tendency to give socially desirable or undesirable responses. Students who score very high on the Soc. U. scale have been overly frank, honest, and even self-deprecatory. Students who obtain very low Soc. U. scores have attempted to make themselves socially and emotionally better than they are.

A high score on the bias scale is defined as a percentile of 95 and above and a low score as a percentile of 5 and below, while scores between 5 and 95 on a single scale do not ordinarily represent a significant amount of distortion. If scores on two or three of the scales approach either extreme, it is not unlikely that there has been some intentional or unintentional distortion.

The OAIS norms are anchored to the scores of entering freshmen at the Universities of Michigan and Minnesota and to the scores of college-bound seniors at Ann Arbor High School. Fricke (1965) refers to this group as the hypothetical norming group. Although the norms are based on neither a random nor a representative sample, Fricke (1965) asserts that no changes will be made in the freshmen norms even though research

over the next few years may indicate discrepancies in the distributions. It is his contention that as test users gain experience with the scores, they gain a feeling for the types of behaviors associated with the particular scores which would be lost in changing the norms.

Reliability and validity coefficients are reported both by Fricke (1965) and Burros (1965). Fricke (1965) reports the median stability coefficient for the fourteen scales for 69 students over a two year period as .62. The coefficients range from a low of .46 (Soc. Adj.) to a high of .76 (Mas. O.). Burros (1965) asserts that with the exception of the Mas. O. scale, Int. Q. appears to have the most satisfactory validity, yielding a correlation of .55 with ACE linguistic aptitude and .48 with ACE English achievement.

Tennessee Self Concept Scale

The Tennessee Self Concept Scale was developed by the Tennessee Department of Mental Health originally as a research instrument that might contribute to the criterion problem in mental health. It was hoped that it would also provide a common thread for tying together many research and clinical findings.

The scale is composed of 100 self descriptive statements which the subject uses to portray his own picture of himself. One of the major advantages of the Tennessee Self Concept Scale is that it is a multi-dimensional scale. Reference has been made to the problem of equivalence of operational measures in attempting to conduct research in the self concept area and the difficulty encountered in attempting comparisons of the results of the available studies. It would seem that a first step in the resolution of the problem would be the identification of the

dimensions of the self concept. The scale identifies eight aspects of the self and gives quantitative scores to each. It further yields seven empirical categories, six of which indicate various types of psychopathology. Other scales include a self criticism scale, a distribution score, a time score, a true-false ratio score and a variability score.

The Total Positive score is a measure of self-esteem, the internal frame of reference within which the individual is describing himself.

It is made up of three subscores.

1. The Identity score describes the individual as he sees himself. It is derived from the "What am I?" items.

2. The Self Satisfaction score describes how the individual feels about the self he perceives. In general, the score reflects self satisfaction or self acceptance.

3. The Behavior score measures the individual's perception of his own behaviors or the way he functions. The scale is derived from items pertaining to "This is how I act," or "This is what I do."

Five scores represent an external frame of reference within which the individual is describing himself.

1. The Physical Self score represents the individual's view of his body, his state of health, his physical appearance, skills, and sexuality.

2. The Moral-Ethical Self score describes how the individual feels about his moral worth, relationship to God, feelings of being a "good" or "bad" person, and satisfaction with one's religion or lack of it.

3. The Personal Self score reflects the individual's sense of personal worth, his feeling of adequacy as a person and his evaluation of his personality apart from his body or his relationship to others.

4. The Family Self score describes the individual's feelings of adequacy, worth, and value as a family member.

5. The Social Self score represents the person's sense of adequacy and worth in his social interaction with other people in general.

The empirical scales were derived by item analysis, resulting in a selection of items which differentiated one group of subjects from all other groups. A brief description of these categories follows.

1. The Defensive Positive Scale (DP) is a subtle measure of defensiveness. The score stems from a basic hypothesis of self theory that individuals with established psychiatric difficulties do have a negative self concept at some level of awareness regardless of how positively they describe themselves. A high DP score indicates a positive self description stemming from defensive distortion while a significantly low DP score means that the person is lacking in the usual defenses for maintaining even minimal self esteem.

2. The General Maladjustment Scale (GM) differentiates patients from nonpatients but does not differentiate one group from another. It serves as a general index of adjustment-maladjustment but provides no indication of the nature of the pathology.

3. The Psychosis Scale (Psy) is made up of items which best differentiate psychotic patients from other groups.

4. The Personality Disorder Scale (PD) pertains to people with basic personality defects and weaknesses in contrast to psychotic states or the various neurotic reactions.

5. The Neurosis Scale (N) is derived from items answered in a similar way to neurotic patients.

6. The Personality Integration Scale (PI) indicates an average or better than average degree of personality integration or level of adjustment.

7. The Number of Deviant Signs Score (NDS) is another empirical measure of psychological disturbance based on variability within the total profile. It is purported to identify deviant individuals with about 80% accuracy.

The Self Criticism Score (SC) is composed of mildly derogatory statements which most people admit as being true for them. High scores usually indicate a normal healthy openness and capacity for self-criticism. However, scores above the 99th percentile indicate that the individual may be lacking in defenses, that is, he may be pathologically undefended. Low scores indicate defensiveness and suggest that the Positive Scores are probably artificially elevated. The SC score is an obvious defensive score whereas the DP is a more subtle measure of defensiveness.

The Distribution Score (D) is a summary score reflecting the way the individual distributes his answers across the five available choices. It measures the certainty with which the individual sees himself. Extreme scores in either direction are undesirable.

The Variability Scores (V) provide a measure of inconsistency from one area of self perception to another. Well integrated people usually score below the mean but above the first percentile.

The True-False Ratio (T/F) is a measure of response bias. It may also be interpreted within the framework of self theory. From this point of view, high T/F scores indicate the individual is achieving self definition or description by focusing on what he is and is relatively

unable to accomplish the same thing by eliminating or rejecting what he is not. A low score would mean the opposite. Scores in the middle range would indicate that the individual achieves self definition by affirming what is self and eliminating what is not self.

Conflict Scores are measured in two ways, net conflict and total conflict, and are reflections of conflicting responses to positive and negative items within the same area of self perception. High scores indicate confusion, contradiction and conflict in self perception while low scores have the opposite meaning. However, extremely low scores indicate a rigid self description.

The Time Score is simply a measure of time that the subject requires to take the test. Presently little is known as to its significance except that it correlates significantly with Net Conflict. However, most subjects complete the Tennessee Self Concept Scale within twenty minutes providing they have sufficient education, intelligence and reading ability and are not interrupted.

According to the Manual (Fitts, 1965), the standardization group from which the norms were developed was a broad sample of 626 people from various parts of the country, ranging in ages from 12 to 68, representative of all social, economic and intellectual levels from 6th grade through the Ph.D. degree.

Since the Tennessee Self Concept Scale is recent in its development, reviews are not yet available. However, test-retest data with 60 college students over a two-week period are reported in the manual as yielding reliability coefficients ranging in the high 80's and low 90's for the self concept scales and the empirical scales (Fitts, 1965). Validation procedures reported in the manual include discrimination between groups,

correlation with other personality measures and personality changes under particular conditions such as psychotherapy. Comparison of psychiatric patients with nonpsychiatric patients demonstrate highly significant differences (.001 level) between groups for most of the scores on the scale (Fitts, 1965).

American College Testing Program Examination (ACT)

The ACT is a test designed for grade 12 and junior college students preparing to go to four-year colleges. The test yields five scores: English usage (80 items), mathematics usage (40 items), social studies reading (52 items), natural science reading (52 items), and a composite score. The ACT Technical Report (1965) reports that the test was designed to measure as directly as possible the abilities the student will have to apply in his college work. Although factual knowledge is assumed to a certain degree, the test emphasizes use of knowledge, criticism, evaluation, judgment, and organizational ability rather than knowledge of facts per se. Burros (1965) reports odd-even reliability coefficients ranging from .83 to .90.

Since a single measure of ability was desired for this study, only the composite score was utilized. The composite score is defined as the mean of the four educational development scores and is viewed as an index of the total educational development of the student. Predictive validity based on the composite score is reported in the ACT Technical Report (1965) as .497.

The method of utilizing these three instruments is presented in the following section.

Methodology

The OAIS was administered to students enrolled in Freshman Orientation in the Department of Education at Oklahoma State University in the fall of 1965. After these students had completed three semesters' work in the Department of Education, those students who were still enrolled in the Department of Education were administered the Tennessee Self Concept Scale and at the same time the OAIS was readministered. It was deemed necessary to readminister the OAIS in order to have a score on the Achiever Personality which was concurrent with the self concept scale.

The administration of the self concept scale and the second OAIS was carried out in the spring of 1967. The instruments were administered by the investigator on the OSU campus to groups ranging from one to about twelve.

ACT scores and grade point averages were collected from records in the Department of Education and the Office of Student Affairs. The OAIS and the Tennessee Self Concept Scale were machine scored by the OAIS Testing Program, Ann Arbor, Michigan, and Counselor Recordings and Tests, Nashville, Tennessee, respectively.

Statistical Procedures

All data was analyzed at the Computer Center on the OSU campus using the IBM 7040. For purposes of describing the freshman group, average percentile ranks were computed for the fourteen subscales of the OAIS, along with the average of the ACT scores.

For purposes of testing Hypothesis 1, a discriminant function analysis was performed in order to assess the OAIS as an instrument for predicting the likelihood of a student's completing three semesters'

work in the Department of Education at OSU. The predictor set utilized nine of the subscales of the OAIS in addition to ACT scores.

The program determined a Generalized Mahalanobia D-Square which is used as a Chi square to test the hypothesis that mean values are the same in the two groups (Drop-Stay) for the ten variables utilized in the predictor set. The discriminant function analysis further allowed a test of the increase in accuracy of prediction over the chance level and, in addition, developed a prediction formula for use on an individual basis using the ten variables selected.

The Abbreviated Doolittle procedure was chosen to test Hypothesis 2. This procedure provides a method of breaking out the regression sums of squares into their component parts in such a way that the portion of the variance in the criterion explained by the various predictor variables can be accounted for separately according to their entry position in the formula. The reader is referred to Steele and Torrie (1960) for a detailed description of the computational procedures utilized in the Abbreviated Doolittle.

The F test was used to determine whether or not the Achiever Personality made a significant contribution to explanation of the variance in the criterion and R^2 's were then computed to determine how much of the variance the variable explained.

To test Hypothesis 3, a stepwise regression analysis was performed in order to determine whether a linear or quadratic function best described the relationship between the independent variable, Achiever Personality, and the nineteen dependent variables. Thus, nineteen separate stepwise regression analyses were performed. F tests of significance were made to determine whether or not the variable was significant

in explaining the variance and the multiple correlations indicated how much of the variance was explained by the particular variable. The program then entered the second function (linear or quadratic) to see if any improvement in the prediction formula was made by this addition. Lastly, the program computed multiple correlation coefficients for the two functions combined.

The advantage of using this procedure is that the program itself selects the best function (linear or quadratic) and determines whether or not the function selected makes a significant contribution in explaining the variation in the criterion. For a discussion of stepwise regression analysis, the reader is referred to Draper and Smith (1966).

In this study, the .05 level of confidence was chosen as the rejection point for tests of statistical significance.

The results of these statistical procedures are presented in detail in Chapter IV.

CHAPTER IV

RESULTS OF THE INVESTIGATION

Introduction

The results of the present investigation are reported under four major divisions: (1) a description of the original population under investigation along a number of dimensions, (2) the utility of a number of these dimensions in predicting whether or not these students would complete three semesters work in the Department of Education at Oklahoma State University, (3) the contribution of the Achiever Personality to the prediction of GPA, and (4) the relationship between the Achiever Personality and the self concept.

Description of the Freshman Group

Table III presents the average percentile ranks for the group enrolled in Freshman Orientation in the Department of Education at Oklahoma State University in the fall of 1965 along the fourteen dimensions measured by the OAIS. The average in terms of ACT scores is also presented for this group.

Observation of Table III indicates that the Freshman group is about average in their set to answer "True" to statements of opinion, attitude and interest and in their tendency either to give socially desirable or undesirable responses. They are somewhat below average in their tendency to give atypical or infrequently given responses.

TABLE III

AVERAGE PERCENTILE RANKS ON THE OASIS
FOR THE ORIGINAL POPULATION TOGETHER
WITH AVERAGE ACT SCORES

Dimensions	Av. % Rank
1. Positive R. Set	52.51
2. Infreq. R.	42.01
3. Soc. Undesir.	47.77
4. Ach. Pers.	44.20
5. Intel. Qual.	37.56
6. Creative Pers.	39.34
7. Soc. Adj.	56.64
8. Emot. Adj.	40.74
9. M.O.	40.76
10. Bus. Int.	40.17
11. Hum. Int.	31.34
12. Soc. Sci. Int.	40.78
13. Phys. Sci. Int.	22.16
14. Biol. Sci. Int.	45.22
15. ACT	44.00

This group, in general, ranks slightly below the 50th percentile on the Intellectual Quality scale as well as creativity (Creative P.).

The Creative Personality subscale was developed to predict creativity as measured by college instructors' ratings.

In terms of the psychological adjustment scales, the freshman group ranks slightly above average in attributes associated with the capacity for good interpersonal relationships or the layman's view of a "good personality" (Soc. A.). Emotional Adjustment (Emo. A.) and Masculine Orientation (Mas. O.) as measured by the subscales are slightly below the hypothetical norming group.

Table III indicates that, as a group, Biological Science, Social Science and Business were the strongest areas of interest. These

averages are somewhat higher than would be anticipated from the hypothetical norming group averages. Physical Science Interest seems to be the lowest in terms of average interest.

In terms of ability, the freshman group obtained an average T score of 19.41 on the ACT test which places them in the 44th percentile. The percentiles are based on national norms for college bound students.

As stated earlier, the "hypothetical" norming group is neither a random nor a representative sample; nor does the author (Frick, 1965) plan to change the norms as reported in the manual. Furthermore, with the exception of the Achiever Personality and the Creative Personality, it is not yet known what the subscales are measuring. The task of discovering the behavioral correlates is made even more difficult by the fact that the instrument is empirically rather than theoretically based. Additional complications are encountered by the fact that the scale scoring is not available to the test user. This being the case, it is impossible to formulate hypotheses relating the scores to behaviors or to examine the scale content to determine why the instrument works as well as it does.

Under these circumstances, detailed statistical analysis would be inappropriate. The averages are presented here in order to describe the particular group under investigation. The value of such averages lies primarily in gaining an understanding of this particular group in relation to the meaning of the scores and in comparing this group to subsequent groups of incoming freshmen.

Utility of the OAIS as a Drop-Stay Predictor

A discriminant function analysis was performed in order to assess

the OAS as an instrument for predicting the likelihood of a student's completing three semesters in the Department of Education at OSU as opposed to other alternatives. The procedure utilizes a widely used Bio-Medical Program (O5M, Version of May 27, 1964, Health Sciences Computing Facility, UCLA) available at the computer center at OSU which is easily adapted to other kinds of data.

The purpose of the analysis was to develop a formula for prediction on an individual basis. The general method of the Bio-Medical O5M develops two equations of the form:

$$F_1 \text{ is a function of } b_{11}X_1 + C_1$$

$$F_2 \text{ is a function of } b_{21}X_1 + C_2$$

More specifically:

$$F_1 = b_{11}X_1 + b_{12}X_2 + b_{13}X_3 + \dots + b_{110}X_{10} + C_1$$

$$F_2 = b_{21}X_1 + b_{22}X_2 + b_{23}X_3 + \dots + b_{210}X_{10} + C_2$$

where F_1 represents the group who completed three semesters' work in the Department of Education at OSU, henceforward known as Stays.

F_2 represents the group who did not complete three semesters' work in the Department of Education at OSU, henceforward known as Drops.

b_1 and b_2 are vectors of coefficients for the scores X_i , where i ranges from 1 - 10.

C_1 and C_2 are constants.

X_i is the vector of scores for the individual on the variables 1 - 10.

If $F_1 > F_2$, the individual is predicted to be a Stay.

If $F_1 < F_2$, the individual is predicted to be a Drop.

If the variables selected made a significant improvement in prediction of the individual's dropping or staying over the assumed 50:50 probability level, the set would be considered useful.

The set of variables selected for the prediction formulas were as follows:

X ₁ Positive Response Set	X ₆ Creative Personality
X ₂ Infrequent Responses	X ₇ Social Adjustment
X ₃ Social Undesirability	X ₈ Emotional Adjustment
X ₄ Achiever Personality	X ₉ Masculine Orientation
X ₅ Intellectual Quality	X ₁₀ ACT score

The program determined a Generalized Mahalanobis D-Square for males and females separately. The Bio-Medical Program, O5M, recommended that this value be used as a Chi-Square with 10 degrees of freedom to test the hypothesis that the mean values are the same in the two groups (Drop-Stay) for the ten variables utilized in the predictor set. The Chi-Square test indicates at what point we reject the hypothesis that this is still a 1:1 ratio. Table IV gives the Mahalanobis D-Square values for Males and Females.

TABLE IV

MAHALANOBIS D-SQUARE VALUES BY SEX FOR
THE TEN PREDICTOR VARIABLES SELECTED

Sex	Obtained D-Square Values
Males	19.90795
Females	59.04114

Tabled Chi-Square Values:

18.3 @ .05 Probability Level
25.2 @ .005 Probability Level

As indicated by the D-Square values, the probability of rejecting the hypothesis that the mean values of the two groups are the same for the ten variables when in fact it is true, falls between p. .05 and p. .025 for the males (Steele and Torrie, 1960). The probability of rejecting the hypothesis when in fact it is true, is less than 5 out of 1000 for the female population. Thus, Hypothesis 1 is rejected.

The program then computed the coefficients and constants necessary for use in the prediction formula. Table V reports the vectors of coefficients and the constants determined for the population of the present investigation.

TABLE V
COEFFICIENTS AND CONSTANTS FOR STAYS
AND DROPS ACCORDING TO SEX

Variables	<u>Males</u>		<u>Females</u>	
	Coefficients		Coefficients	
	Stay (F_1)	Drop (F_2)	Stay (F_1)	Drop (F_2)
X ₁	.228	.255	.191	.182
X ₂	.338	.344	.196	.192
X ₃	.173	.202	.151	.147
X ₄	.241	.266	.248	.231
X ₅	.066	.061	-.046	-.046
X ₆	.010	.127	.113	.111
X ₇	.226	.230	.185	.162
X ₈	.318	.314	.218	.213
X ₉	.007	-.001	.036	.038
X ₁₀	1.044	.900	1.941	1.767
	Constants		Constants	
	-50.936	-53.358	-50.211	-43.661

As a test of the formula developed by the program, the actual data used to develop the formula was classified by the formula into predicted Drops and predicted Stays. The program evaluated the classification function for each case in the population in order to determine the ratio of correct (Hit) vs. incorrect (Miss) classification using the constants and coefficients obtained. Thus, for each individual male, F_1 and F_2 functions are determined as follows:

$$F_1 = .228X_1 + .338X_2 + .173X_3 + .241X_4 + .066X_5 + .010X_6 + .226X_7 + .318X_8 + .007X_9 + 1.04X_{10} - 50.936.$$

$$F_2 = .255X_1 + .344X_2 + .202X_3 + .266X_4 + .061X_5 + .127X_6 + .230X_7 + .314X_8 - .001X_9 + .900X_{10} - 53.358.$$

If $F_1 > F_2$, the male is classified in the Stay group.

If $F_1 < F_2$, the male is classified in the Drop group.

F_1 and F_2 functions were computed for each female using the appropriate coefficients and constants. In this way, the program predicted whether each individual in the sample would drop or stay on the basis of the variables selected for the predictor set.

Table VI indicates the number of males and females which were correctly classified (Hits) and the number which were incorrectly classified (Misses) on the basis of the prediction formulas for the population under investigation. Hits refer to the number of individuals which the program predicted would stay or drop who in fact did stay or drop. Misses refer to the number of individuals which the program predicted would stay or drop who in fact did the opposite. The Hit - Miss table reports the number of times the formula predicted correctly and the number of times it predicted incorrectly.

TABLE VI
 NUMBER OF MALES AND FEMALES ACCURATELY AND INACCURATELY
 CLASSIFIED AS STAYS AND DROPS
 BY THE PREDICTION FORMULA

	Males			Females		
	Hits (N)	Misses (N)	Total (N)	Hits (N)	Misses (N)	Total (N)
Stays	19	8	27	98	39	137
Drops	<u>29</u>	<u>11</u>	<u>40</u>	<u>100</u>	<u>44</u>	<u>144</u>
	48	19	67	198	83	281

Out of the total male population of 67, 27 actually stayed and 40 dropped. Inspection of Table VI indicates that of the 67 males in the sample, the program correctly classified 19 out of the 27 who did in fact stay and misclassified 8 of the 27. The program correctly classified 29 of the 40 who dropped and misclassified 11. The ratio of correctly classifying the males in terms of Staying (Hit ratio) was 48:67 or 72% (71.6) whereas 28% were misclassified. This is an improvement of 22% over the assumption of chance (50:50). Thus, chances of correct classification in terms of Stay or Drop are approximately 72 out of 100 for the males on the basis of the variables selected for the predictor set.

Out of the total female population of 281, 137 actually stayed and 144 dropped. Inspection of Table VI indicates that the Hit ratio for the females was 198:281 or 70%. This is an improvement of 20% over the assumed equal probability. The program correctly classified 98 of the 137 females who stayed and misclassified 39. It correctly classified 100 of the 144 who dropped and misclassified 44. In summary, the chances of correct classification in terms of Stay or Drop are

approximately 70 out of 100 on the basis of the variables selected for the predictor set for females in the present investigation.

Discussion of the Results of the Discriminant Function Analysis

The purpose of performing a discriminant function analysis on the variables selected was to determine the usefulness of the OAIS in predicting the likelihood of a student's remaining in the Department of Education at Oklahoma State University versus choosing some other alternative. The hypothesis that the OAIS combined with ability makes no improvement in the likelihood of the students' completing three semesters in the Department of Education at Oklahoma State University over a chance level was rejected. A simple Drop-Stay frequency count indicated that the chances were approximately 50:50. However, it would be helpful to predict more accurately which particular individuals were more likely to Stay than Drop. The results indicated that the accuracy of prediction for the group under investigation was about 70% utilizing the variables selected. However, it should be noted that these figures are indicative of the particular population under consideration. In order to establish confidence in these variables as predictors, it would be necessary to utilize the coefficients and constants obtained in this sample on several groups of incoming freshmen.

Another consideration of the value of such a prediction involves the relative importance of determining which students were likely to remain in relation to the cost of accumulating the necessary data. If this is important (and it is to most departments within a college), a measure of this sort coupled with a measure of ability might be useful

both to the department and to the students in suggesting at an early date, those students who are likely to remain as opposed to those who are likely to drop out of the program. The OAIS could be administered at the end of the senior year in high school and the results sent to the institution at some saving to the department in time and money.

Further, students of considerable ability judged likely to drop out could be counseled early in their academic careers in an attempt to discover their particular difficulties, if any.

Contribution of the Achiever Personality
to the Prediction of GPA

The Abbreviated Doolittle procedure was chosen to test the hypothesis that the Achiever Personality makes no contribution to the prediction of GPA over and above ability. This procedure is a set of rules (an algorithm) which provides a way of breaking out the regression sums of squares into their component parts in such a way that the portion of the variance in the criterion (GPA) explained by the various predictor variables (in this case ACT and Achiever Personality) can be accounted for separately in accordance with their entry position in the formula. The model assumed for this analysis is of the form:

$$Y = B_0 + B_1X_1 + B_2X_2 + E$$

where Y is the observed criterion variable GPA

B_0 is the correction factor for the mean of Y

B_1 is the weight or partial regression coefficient associated with X_1 .

B_2 is the weight or partial regression coefficient associated with X_2 .

X_1 is ACT (a predictor variable)

X_2 is the Achiever Personality (a predictor variable)

E is error

This procedure provides for predicted values of B_0 , B_1 , and B_2 .

It is important to note that the amount of variance accounted for by the predictor variables depends on the order in which these variables are entered into the formula. In the present investigation, the general formula states that GPA is a function of ACT and Achiever Personality. The portion of the variance in GPA accounted for by the Achiever Personality is that amount after consideration of ACT. Thus it would be incorrect to assume that the same results would be obtained from a different entry order.

The data were analyzed for the total population that completed three semesters in the Department of Education at Oklahoma State University. Separate analyses were then performed by sex since failure to control for this variable often distorts the results. Further, since the population of males (N 27) is small, it is felt that more confidence can be placed in the analysis for females (N 137).

Table VII presents the analysis of the regression of Y on X_1 and X_2 . The particular breakdown as given in the table was obtained by the Doolittle procedure.

Inspection of the table indicates that an F value as high as the one obtained could be expected to occur by chance alone less than 5 times out of 1000 (Steele and Torrie, 1960). The results of the analysis indicate that the Achiever Personality does exert a significant influence on the criterion, GPA. Thus, hypothesis 2 is rejected. In order to determine how much of the variance in GPA could be accounted for by

the Achiever Personality under the assumed model, R^2 's were computed for both the combined and separate effects of ACT and the Achiever Personality.

TABLE VII
ANALYSIS OF VARIANCE FOR TOTAL POPULATION

Source	df	Sums of Squares	Mean Square	F
Total	164	1159.8684		
R(B_0)	1	1089.8443		
R(B_1/B_0)	1	19.4965		
R($B_2/B_0, B_1$)	1	6.5946	6.5946	24.1649
Error	161	43.9330	.2729	

Tabled value of F for 1/161 df is 7.88 @ .005 level
3.84 @ .05 level

The square of the multiple correlation coefficient, R^2 is defined as:

$$R^2 = \frac{\text{Sums of Squares due to regression}}{\text{Total (corrected) Sums of Squares}}$$

It is often stated as a percentage, $100R^2$. The larger it is, the better the fitted equation explains the variation in the data (Draper and Smith, 1966, p. 117). Thus $R^2 = \frac{\text{Reg. SS}}{\text{Total Corr. SS}} = \frac{26.0911}{70.0241} = .37$

R^2 is interpreted as meaning that approximately 37% of the variance in GPA is explained by ACT and the Achiever Personality for the population under investigation.

To determine how much of the variation in GPA is accounted for by the variables separately the following calculations were performed:

$$\frac{\text{SS due to the Reg. of } B_1/B_0}{\text{Total Corr. SS}} = \frac{19.4965}{70.0241} = .278$$

The figure indicates that for this population, 27.8% of the variance in GPA is accounted for by the ACT when we assume this particular model. Again, it should be stressed that the results depend on the order in which the X variables are introduced into the equation. Then

$$\frac{\text{SS due to the Reg. of } B_2/B_1, B_0}{\text{Total Corr. SS}} = \frac{6.5946}{70.0241} = .094$$

The figure indicates that for this population, approximately 9% of the variance in GPA is accounted for by the Achiever Personality.

In summary, 37% of the variance in GPA is accounted for by using ACT scores and the Achiever Personality scale for the total population who remained in the Department of Education for three semesters. 27.8% of the variance is explained by the ACT scores and 9.4% is explained by the Achiever Personality under the assumed model.

Separate multiple linear regression analysis and R^2 's were then performed for males and females separately. Table VIII presents the regression of GPA on ACT and Achiever Personality for the female sample.

TABLE VIII
ANALYSIS OF VARIANCE FOR FEMALES

Source	df	Sums of Squares	Mean Square	F
Total	137	1008.6893		
R(B_0)	1	952.3024		
R(B_1/B_0)	1	15.2982		
R($B_2/B_0, B_1$)	1	4.7707	4.7707	17.60
Error	134	36.3178	.2710	

Tabled value of F for 1/134 df is 7.88 at the .005 level

Inspection of Table VIII indicates that an F value as high as the one obtained could be expected to occur by chance alone less than 5 times out of 1000 (Steele and Torrie, 1960). Results of the analysis indicate that the Achiever Personality does exert a significant influence on the criterion, GPA. Thus, hypothesis 2 is rejected for the female sample.

In order to determine the percent of variance explained by ability and a measure of achievement orientation for females, values of R^2 were determined.

$$R^2 = \frac{\text{Regression Sums of Squares}}{\text{Total (corrected) Sums of Squares}} = \frac{20.0911}{56.3869} = 35.63\%$$

$$\frac{\text{Sums of Squares due to Reg. of } B_1/B_0}{\text{Total (corrected) Sums of Squares}} = \frac{15.2982}{56.3869} = 27.13\%$$

$$\frac{\text{Sums of Squares due to Reg. of } B_2/B_0, B_1}{\text{Total (corrected) Sums of Squares}} = \frac{4.7707}{56.3869} = 8.46\%$$

R^2 values indicate that ability, as measured by ACT scores, and the Achiever Personality together account for approximately 36% of the variance in GPA for the females of the population under investigation. Of this, 27% is explained by ACT scores and 8% is explained by the Achiever Personality when the variables are entered into the equation in this order.

Table IX presents the regression of Y on X_1 and X_2 for males using the Abbreviated Doolittle procedure.

Inspection of the table indicates that for the present sample of 27 males, the Achiever Personality does not make a significant contribution to GPA over and above ability. The obtained value lies between a probability of .1 and .2 (Steele and Torrie, 1960). Thus, hypothesis 2 is partially accepted.

TABLE IX
ANALYSIS OF VARIANCE FOR MALES

Source	df	Sums of Squares	Mean Square	F
Total	27	151.1793		
R(B ₀)	1	140.4024		
R(B ₁ /B ₀)	1	3.4950		
R(B ₂ /B ₀ , B ₁)	1	.8219	.8219	2.82
Error	24	6.460	.2917	

Tabled value of F for 1/24 df is 4.26 at the .05 level
9.55 at the .005 level

To determine the percent of variance accounted for by ACT scores and the Achiever Personality, R^2 was calculated as follows:

$$R^2 = \frac{\text{Reg. SS}}{\text{Total Corr. SS}} = \frac{4.3169}{10.7769} = 40\%$$

$$\frac{\text{Reg. SS for } B_1/B_0}{\text{Total Corr. SS}} = \frac{3.4950}{10.7769} = 32.4\%$$

$$\frac{\text{Reg. SS for } B_2/B_0, B_1}{\text{Total Corr. SS}} = \frac{.9210}{10.7769} = 7.6\%$$

For this population of males, approximately 40% of the variance in GPA is accounted for by ACT scores and the Achiever Personality, 32.5% by ability and 7.6% by the Achiever Personality.

Summary of the Contribution of the Achiever
Personality to the Prediction of GPA

The Abbreviated Doolittle was performed in order to determine whether or not the Achiever Personality scale made a significant contribution to the prediction of GPA over and above ability, first, for the

total population of students completing three semesters' work in the Department of Education at OSU (N 164), and then, for males (N 27) and females (N 137) separately. Results indicated that in the case of the total and female population, the Achiever Personality scale did contribute to this prediction significantly. To this extent Hypothesis 2 is rejected. However, the analysis indicated that in the case of the male sample, no significant contribution was made by the addition of this variable. Thus, Hypothesis 2 is partially accepted.

In order to determine how much of the variation in GPA could be accounted for by ACT scores and the Achiever Personality separately, R^2 s were calculated, first, for the total population under consideration, then, for males and females separately. Results indicate that for the total population, approximately 37% of the variance in GPA can be explained by ACT scores and the Achiever Personality, ACT scores accounting for 27.8% while the Achiever Personality accounts for about 9.4%. For the female population, ACT scores together with the Achiever Personality accounted for approximately 36% of the variance in GPA. ACT scores contributed about 27% of the variance and the Achiever Personality about 8%. For males, the total variance accounted for by these two variables was approximately 40%, 32.4% being accounted for by ACT scores and 7.6% by the Achiever Personality.

Relationship of the Achiever Personality to the Self Concept

Although it can be concluded from the data that the need for academic achievement exerts a significant influence on academic success, the question arises as to the relationship between this need and

personality development. One of the major goals of the present study was to investigate the relationship between the Achiever Personality and the self concept. For this purpose the Tennessee Self Concept Scale was chosen since it yields not only a number of measures of various aspects of the self concept but also several empirical scales purportedly measuring various types of psychopathology as well.

As stated in Chapter II, theoretical considerations as well as a number of empirical studies suggest that the relationship between the Achiever Personality and the self concept may be curvilinear rather than linear. A stepwise regression analysis was chosen to investigate the form of the function relating the Achiever Personality to the various aspects of the self concept, the empirical scales, ability and grade point average. For this purpose the model

$$Y_{1-n} = B_0 + B_1X_5 + B_2(X_5)^2 + E \text{ was assumed}$$

where: Y_{1-n} are the various subtests of the self concept scale, the empirical scales, ability, and grade point average as specified in Hypothesis 3.

B_0 is a vector of constants

B_1 and B_2 are vectors of coefficients for the scores X_5

X_5 is the Achiever Personality

B_1X_5 is the linear function

$B_2(X_5)^2$ is the quadratic function

E is error

This model allowed a test of whether a linear or curvilinear function best approximated the data for each of the 19 variables selected.

A separate stepwise regression analysis was performed on each of these variables. Results of the analysis are presented in Tables

X and XI. In this type of analysis, the program itself selects the best function and enters it first. The second step enters the second function to determine whether or not any improvement is made in the prediction equation by this addition. Thus, where the program entered variable 2 at step one, the program determined that the quadratic or curvilinear function best fit the data. Where the program entered variable 1 first, the program determined that a linear function was a better approximation. The F level reported indicates the significance of the contribution of the linear or quadratic form of the Achiever Personality in explaining the variation in Y_{1-n} . The multiple correlation indicates how much of the variance in Y can be explained by the Achiever Personality.

Separate analyses were performed for males (N 25) and females (N 120) due to the large discrepancy in numbers of subjects and to the fact that significant sex differences are often found. The small sample size for males suggests that little confidence can be placed in the results for this group.

Analysis for Females

Table X presents (1) the dependent variables, (2) the function selected as best by the program (linear, 1, or quadratic, 2), (3) F values for the function entered first, (4) the multiple correlations, (5) the function entered second, (6) the F values for the second function entered, and (7) the multiple correlations utilizing both these functions for the 19 dependent variables selected. The F test of significance indicates whether the function selected makes a significant contribution to the explanation of the variance in the Y variable and the multiple correlation explains how much of the variance is accounted for. It

TABLE X

ENTERING VARIABLES, F VALUES AND MULTIPLE CORRELATIONS RELATING
THE ACHIEVER PERSONALITY TO THE DEPENDENT VARIABLES

Females N 120						
(1) Dependent Variable	(2) Step 1 Ent. Var.	(3) F Level (1,118 df)	(4) Mult. Corr.	(5) Step 2 Ent. Var.	(6) F Level (2,117 df)	(7) Mult. Corr.
a. Self Esteem	1	3.58	0.17	2	0.01	0.17
b. Identity	1	5.11*	0.20	2	0.36	0.21
c. Self Satisfaction	2	0.91	0.09	1	0.02	0.09
d. Behavior	1	5.04*	0.20	2	0.06	0.20
e. Physical Self	1	0.49	0.06			
f. Moral Ethical Self	1	7.17**	0.24	2	0.01	0.24
g. Personal Self	1	2.72	0.15	2	0.60	0.17
h. Family Self	2	4.70*	0.20			
i. Social Self	2	0.14	0.03	1	0.08	0.04
j. Self Criticism	1	16.45***	0.35	2	0.02	0.35
k. Defensive Positive	1	4.76*	0.20	2	0.01	0.20
l. General Maladjustment	1	2.40	0.14	2	0.02	0.14
m. Psychosis	2	1.00	0.09	1	0.39	0.11
n. Personality Disorder	1	9.03***	0.27	2	0.00	0.27
o. Neurosis	1	3.10	0.16	2	0.18	0.16
p. Personality Integration	2	5.09*	0.20	1	0.20	0.21
q. No. of Deviant Signs	1	8.98***	0.27	2	0.09	0.27
r. ACT	2	0.54	0.07	1	0.11	0.07
s. GPA	2	12.64***	0.31	1	0.00	0.31

*Sig. @ .05 Level. Tabled F for 1,118 df 3.92 @ .05 Tabled F for 2,117 df 3.07 @ .05
 **Sig. @ .01 Level. 6.85 @ .01
 ***Sig. @ .005 Level. 8.18 @ .005 (Steele and Torrie, 1960)

should be noted that the first "multiple correlation" is a misnomer since the term correctly applies only to the correlation between variables $X_1 + X_{2-n}$ and the Y variable.

Table X is read as follows: For the dependent variable under consideration, either a quadratic (2) or linear (1) function was chosen by the program as best describing the relationship between the Achiever Personality and the particular dependent variable. A significant F value in column 3 is interpreted as meaning that the form of the function chosen is significant in explaining the variation in the Y variable. However, a non-significant F value is interpreted as meaning that neither the linear nor the quadratic form makes a significant contribution in describing the relationship even though the program made a choice. The multiple correlation (column 4) indicates how much of the variation in the dependent variable can be accounted for by the particular form of the Achiever Personality selected. At the second step (column 5) the alternate form of the function is entered to determine if this addition makes any improvement in the prediction formula. Observation of the non-significant F values in column 6 indicates that in no case did the addition of the second function improve the formula. The multiple correlation in the last column tells us how much of the variance in the Y variable can be accounted for by both forms of the function combined.

Observation of Table X indicates that the quadratic form of the Achiever Personality made a significant contribution in explaining the variation in the Family Self (.05 level), Personality Integration (.05 level), and GPA (.005 level) for the population under consideration. Wert, Neidt, and Ahman (1954) point out that the significance of the quadratic form yields satisfactory proof of nonlinearity but does not

necessarily imply that the quadratic equation is the most desirable curve that could be chosen; that is, it does not tell us the shape of the curve.

Table X further indicates that significant linear relationships were found between the Achiever Personality and Self Criticism (.005 level), Identity (.05 level), Behavior (.05 level), Moral Ethical Self (.01 level), Defensive Positive (.05 level), Personality Disorder (.005 level), and Number of deviant signs (.005 level). The significance of these relationships is interpreted as meaning that the linear form of the function of the Achiever Personality makes a significant contribution to the explanation of the variance in these dependent variables.

The non-significant F values for the functions entered first are interpreted as meaning that neither the linear nor the quadratic form of the function describes the relationship between the Achiever Personality and certain dependent variables. Thus, no statement can be made regarding the relationship between the Achiever Personality and Self Esteem, Self Satisfaction, Physical Self, Personal Self, Social Self, General Maladjustment, Psychosis, Neurosis, and ACT scores.

Analysis for Males

Table XI presents the same results for the male sample: the dependent variables, the function entered first, the F values for the function entered first, the multiple correlations, entry of the second function, F values for the second function, and the multiple correlations utilizing both functions. The F test of significance indicates whether the function selected makes a significant contribution to the explanation of the variance in the Y variables and the multiple correlation explains how

TABLE XI

ENTERING VARIABLES, F VALUES AND MULTIPLE CORRELATIONS RELATING
THE ACHIEVER PERSONALITY TO THE DEPENDENT VARIABLES

Males N 25						
(1) Dependent Variable	(2) Step 1 Ent. Var.	(3) F Level (1,23 df)	(4) Mult. Corr.	(5) Step 2 Ent. Var.	(6) F Level	(7) Mult. Corr.
a. Self Esteem	2	0.00	0.01	1	0.32	0.12
b. Identity	2	0.02	0.03	1	0.92	0.20
c. Self Satisfaction	1	0.10	0.07	2	0.02	0.07
d. Behavior	1	0.16	0.08	2	0.71	0.20
e. Physical Self	1	0.14	0.08	2	0.04	0.09
f. Moral Ethical Self	1	0.01	0.02	2	0.24	0.11
g. Personal Self						
h. Family Self	2	0.00	0.02	1	0.01	0.02
i. Social Self	2	0.40	0.13	1	1.00	0.24
j. Self Criticism	1	2.15	0.29	2	0.01	0.29
k. Defensive Positive	1	0.04	0.04			
l. General Maladjustment	2	0.01	0.02	1	0.91	0.20
m. Psychosis	1	0.38	0.13	2	1.54	0.28
n. Personality Disorder	1	0.19	0.09	2	0.02	0.10
o. Neurosis	1	0.00	0.01	2	0.33	0.12
p. Personality Integration	2	0.86	0.19	1	0.26	0.22
q. No. of Deviant Signs	1	0.44	0.14	2	0.13	0.16
r. ACT	2	0.51	0.15	1	0.05	0.16
s. GPA	1	1.91	0.28	2	0.12	0.29

Tabled F value for 1,23 df 4.28 @ .05 Level (Steele and Torrie, 1960)

much of the variance is accounted for.

Table XI indicates that no significant relationships, either quadratic or linear, were found for the male population. This means that neither the linear nor the quadratic form of the function is significant in explaining the variance in the Y variables. Although some differences can be observed between males and females in the variables entering the equation first, it is not possible to determine whether these differences are due to actual sex differences or to the sample size.

Since significant results were obtained only in the female sample, further discussion of the results of the Stepwise Regression Analyses will pertain exclusively to females.

Results of the Stepwise Regression Analysis will be discussed in terms of: (1) Significant and non-significant linear and quadratic functions for purposes of accepting or rejecting the hypotheses as stated in Chapter II, and (2) A discussion of the meaning of the results.

Hypothesis 3 states that the quadratic form of the function relating the Achiever Personality to aspects of the self concept, the empirical scales, ability and GPA makes no improvement over a linear function. Table XIII reports the acceptance or rejection of Hypothesis 3 for the 19 variables tested in terms of significant and non-significant quadratic and linear functions.

Although the program entered the quadratic function first for variables c, i, m, and r, and the linear function first for variables a, e, g, l, and o, it should be understood that these functions have no meaning in the light of the observed F values. This is to say, neither a quadratic nor a linear function describes the relationship between the Achiever Personality and these variables.

TABLE XII

SIGNIFICANT AND NON-SIGNIFICANT QUADRATIC AND LINEAR
FUNCTIONS RELATING THE ACHIEVER PERSONALITY
TO VARIOUS ASPECTS OF THE SELF CONCEPT,
THE EMPIRICAL SCALES, ABILITY, AND GPA

<u>Significant Quadratic Functions</u>		
Ho 3-h	Family Self	Ho Rejected
Ho 3-p	Personality Integration	Ho Rejected
Ho 3-s	GPA	Ho Rejected
<u>Significant Linear Functions</u>		
Ho 3-j	Self Criticism	Ho Accepted
Ho 3-b	Identity	Ho Accepted
Ho 3-f	Moral Ethical Self	Ho Accepted
Ho 3-d	Behavior	Ho Accepted
Ho 3-k	Defensive Positive	Ho Accepted
Ho 3-n	Personality Disorder	Ho Accepted
Ho 3-q	No. of Deviant Signs	Ho Accepted
<u>Non-Significant Quadratic Functions</u>		
Ho 3-c	Self Satisfaction	Ho Rejected
Ho 3-i	Social Self	Ho Rejected
Ho 3-m	Psychosis	Ho Rejected
Ho 3-r	ACT	Ho Rejected
<u>Non-Significant Linear Functions</u>		
Ho 3-a	Self Esteem	Ho Accepted
Ho 3-e	Physical Self	Ho Accepted
Ho 3-g	Personal Self	Ho Accepted
Ho 3-l	General Maladjustment	Ho Accepted
Ho 3-o	Neurosis	Ho Accepted

Observation of Table X indicates that in no instance did addition of the second variable at Step 2 make any improvement in the prediction equation over the function entered first (Tabled value of F with 2 and 118 df, 3.07). This means that the variable entered first (either quadratic or linear) gives the best prediction equation and that the addition of the second variable will not improve the equation significantly.

Discussion of the Results of the Stepwise Regression Analyses

Comparison of the variables which resulted in a significant quadratic relationship to the Achiever Personality with those indicating a significant linear relationship helps clarify the problem of the need for academic achievement as it relates (1) to aspects of the self concept and (2) its effect on personality development as defined by the empirical scales. Figures 1 and 2 are presented in order to graphically illustrate these relationships in a generalized fashion. The graphs are not intended to represent the actual mathematical relationships existing but rather the trend of the function. It should be remembered that the significance of the quadratic form yields satisfactory proof of nonlinearity but does not necessarily imply that the quadratic equation is the most desirable curve which might be chosen (Wert, Neidt, and Ahman, 1956).

Although a high level of academic achievement is positively reinforced by the school in general and certain segments of the parent population in particular, theoretical considerations question the indiscriminant reinforcement of a need to achieve academically at a high level for reasons of healthy personality development.

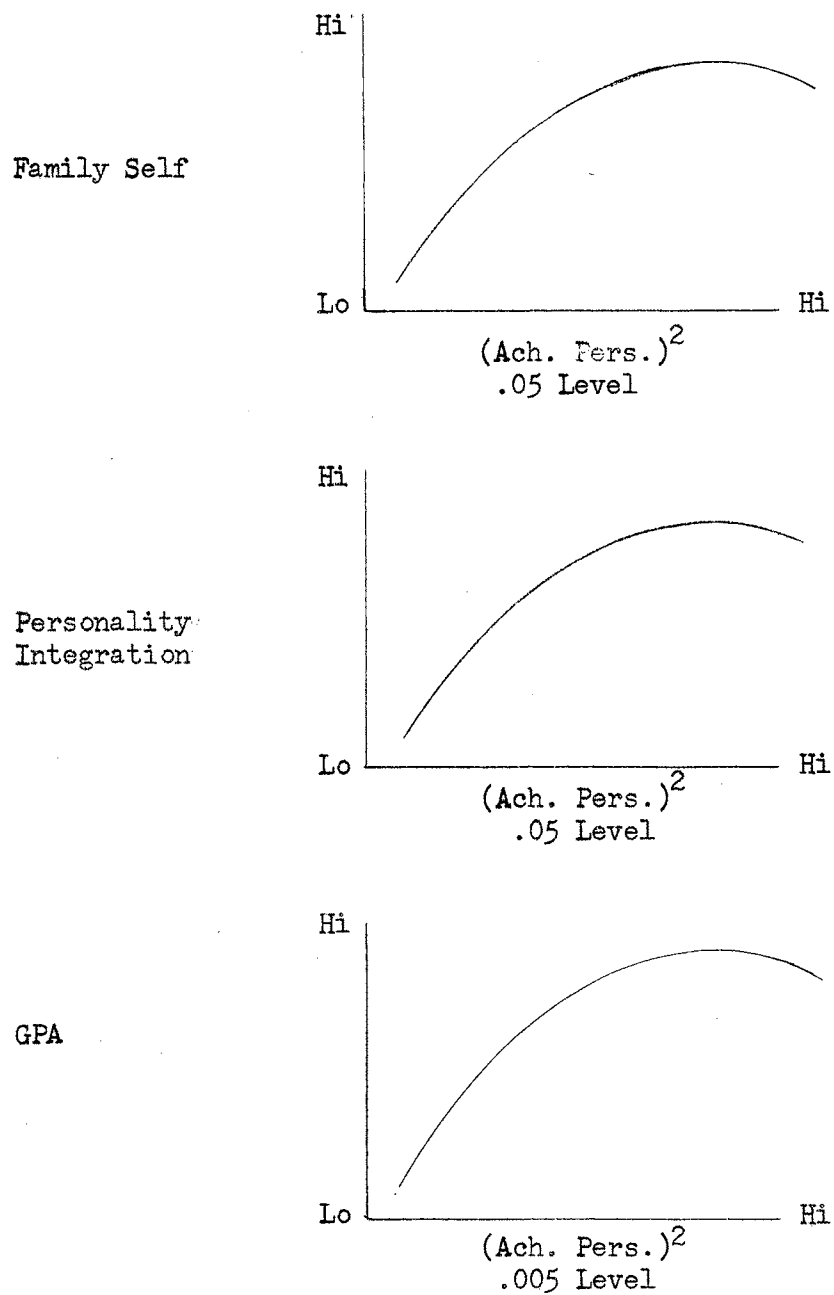


Figure 1. Generalized Illustrations of Significant Quadratic Relationships with Achiever Personality

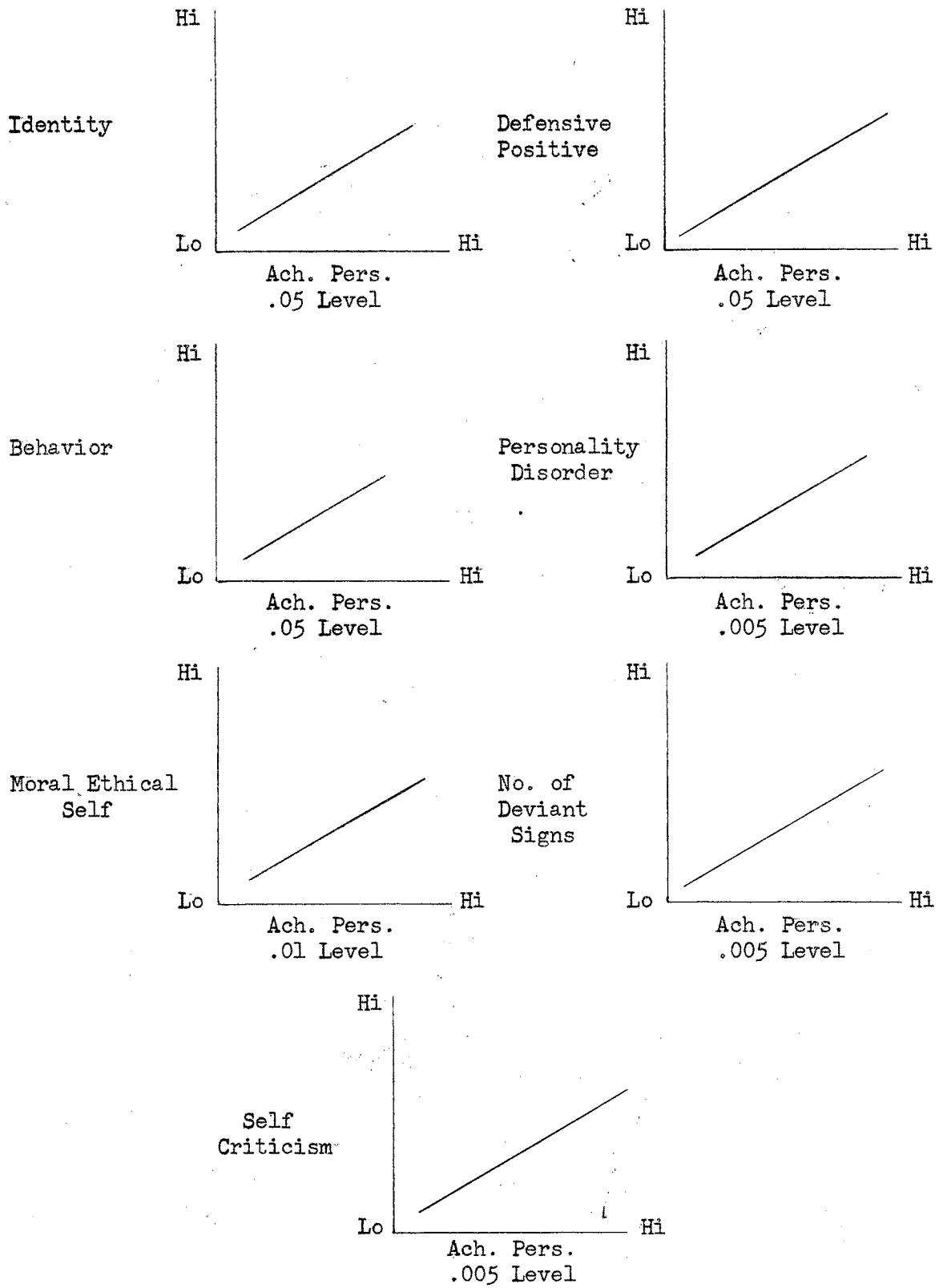


Figure 2. Generalized Illustrations of Significant Linear Relationships with Achiever Personality

Examination of Figures 1 and 2 indicates that a curvilinear relationship exists between the Achiever Personality and Family Self, Personality Integration and GPA while a linear trend best describes the relationship between Achiever Personality and Identity, Behavior, Moral Ethical Self, Self Criticism, Defensive Positive, Personality Disorder, and Number of Deviant Signs.

Family Self refers to the individual's perception of himself in reference to his most immediate circle of associates, his feelings of adequacy, worth and value as a family member. One might infer that moderate levels of the Achiever Personality are related to a positive Family Self but beyond certain limits, increases in need for academic achievement tend to be associated with a less positive perception of oneself as a family member. The literature suggests that the desire to do well academically develops rather early, probably at the pre-school level by parents who are seen as loving and powerful, who place a high value on academic achievement themselves, and who see achievement as benefiting the child as well as important (pleasing) to the parents (McCandless, 1966). It would seem that fostering the attributes associated with academic achievement may be beneficial up to a point, but beyond this point, detrimental in terms of personality development.

This inference seems to be supported by the linear trend in the relationship between the Achiever Personality and Moral Ethical Self and Behavior. In a sense, the person with a high need for academic achievement sees himself as a "good" person and can feel "good" about his behavior. It is interesting to note that no significant relationship exists between the Achiever Personality and Self Esteem or Self Satisfaction. Evidently, the Achiever Personality does not make a

significant contribution to the explanation of the variation in these two aspects of the self concept.

It does, however, contribute in a linear fashion to Identity (what the individual is as he sees himself). That these attributes may be fostered at a cost to the individual is supported by the highly significant linear trend in Self Criticism. While Self Criticism is generally seen as a healthy openness to self criticism; at either extreme, this is not the case. When the significant linear trend between Achiever Personality and Defensive Positive is noted in conjunction with Self Criticism, there is a suggestion of either lack of adequate defenses or a defensively positive attitude.

A curvilinear trend is noted between the Achiever Personality and Personality Integration. Here again, the Achiever Personality is seen as contributing to Personality Integration up to a point. However, as Achiever Personality continues to increase, the rate of acceleration in Personality Integration tends to decrease. This relationship is further substantiated by the highly significant linear trend between the Achiever Personality and Number of Deviant Signs (the scales best index of psychological disturbance) and Personality Disorder.

The highly significant quadratic form of the function relating the Achiever Personality to GPA suggests that the Achiever Personality does contribute to the prediction of GPA up to a point. However, beyond a certain level, GPA seems to decline in its relationship to the Achiever Personality.

One rather important factor emerges when the results of the Doolittle procedure are compared with the results of the stepwise regression analysis relating the Achiever Personality to GPA. The Doolittle

procedure assumes a linear relationship between these two variables. The stepwise regression analysis indicated that the relationship is curvilinear. Most of the studies investigating the effect of personality variables on GPA assume linearity; i.e., correlational studies, and regression analysis. These results seriously question the appropriateness of the models generally employed. It would seem that much more work needs to be done in determining the nature of the relationship between variables before much confidence can be placed in the results.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

General Summary of the Investigation

The purpose of the present study was concerned with (1) describing the group of students enrolled in Freshman Orientation in the Department of Education at Oklahoma State University in the fall of 1965, (2) evaluating the OAIS as an instrument for predicting the likelihood of these students completing three semesters' work in the Department, (3) assessing the contribution of the Achiever Personality scale to the prediction of GPA over and above ability, and (4) investigating the relationship between the Achiever Personality and the self concept.

Statistical procedures utilized for examining these areas of interest were (1) computation of average percentile ranks, (2) a discriminant function analysis, (3) the Abbreviated Doolittle procedure and (4) stepwise regression analysis respectively. All data were analyzed at the Computing Center at Oklahoma State University using the IBM 7040.

Three instruments were used to measure the characteristics under investigation. These were the OAIS, the Tennessee Self Concept Scale and the ACT test. Of particular interest was the Achiever Personality, a subscale of the OAIS. This scale was assessed in terms of its contribution to the prediction of GPA, its relationship to various aspects of the self concept, to measures of psychopathology and to ability.

Subjects for the investigation included 348 students enrolled in Freshman Orientation in the fall of 1965. This group was divided into two groups: those who completed three semesters' work in the Department of Education and those who did not. The groups were further divided by sex.

The OAIS was administered in the fall of 1965 to the original total population. In the spring of 1967, those students who still remained were administered the self concept scale and at that time the OAIS was readministered. ACT scores and grade point averages were collected from records in the Department of Education and the Office of Student Affairs.

Results and Conclusions

Average percentile ranks for the fourteen OAIS subscales were obtained for the freshman group along with average ACT scores in order to describe the freshman group under investigation. Detailed analysis of the data was contraindicated at the present time since, with the possible exception of the Achiever Personality and the Creative Personality, it is not yet known what the subscales are measuring. The value of these averages lies in the contribution they could make to an understanding of the freshmen students enrolled in the Department of Education at Oklahoma State University in 1965 and in comparing this group to subsequent groups of incoming freshmen.

It is concluded that the instrument is not yet ready for use in vocational-educational counseling or in academic selection. However, it would be expected that, as further research is conducted with the individual subscales as well as with the instrument as a whole, a more definitive picture of the test's usefulness can be drawn.

Results of the discriminant function analysis suggest that selected subscales of the OAIS coupled with ACT scores do make an improvement of about 20% above a 50:50 chance level in the prediction of a student's remaining in the program as opposed to his dropping out. That is, the program was able to predict with about 70% accuracy which students would stay and which would drop for the population under investigation.

Although statistically significant differences were found between these two groups, the value of the predictor set depends in part on the importance attached to this information by the institution. It would seem that one of its major values lies in the fact that the program develops a formula for prediction on an individual basis. This information could be used by counselors early in a student's career with benefit both to the student and to the institution.

However, further research with the instrument would be necessary before it could be used with confidence. The efficiency of the analysis needs to be tested over several classes of incoming freshmen before a statement of the efficiency of prediction can be made.

The present investigation focused on a particular subscale of the OAIS, the Achiever Personality. An effort was made to determine the contribution that this subscale made in predicting GPA over and above ability. The data was analyzed for the total population and then for males and females separately using the Abbreviated Doolittle procedure. Results indicated that the Achiever Personality did make a statistically significant contribution to the prediction in GPA for the total and for the female population, but not for the male sample. R^2 's were computed to determine how much of the variance in the criterion the scale was accounting for. Results of this analysis indicated that approximately

37% of the variance in GPA could be explained by ACT scores and Achiever Personality combined; 28% by ACT scores and 9% by the Achiever Personality for the population under investigation. These results are similar to those found by Webb (1965) at Emory University, and Watson for The Cooper Union freshmen enrolled in Engineering, Art, and Architecture as reported by Fricke (1965).

The present study tends to substantiate the claim made by the author (Fricke, 1965) that the scale is measuring attributes of the individual other than ability which are associated with academic success. This claim is supported by both the significant F values and by the lack of correlation between the Achiever Personality and ACT scores.

Although the Achiever Personality is of little value in counseling and selection of students at the present time, further research with this scale is indicated. The need for unidimensional measures was stressed in Chapter II. If the items making up this scale were made available for research purposes, it is likely that a more meaningful body of information would be accumulated. In this way, the behavioral correlates could be identified and relationships with other variables investigated. It is possible that this scale would prove useful as a measure of academic achievement motivation. At the present time, however, the cost of using the instrument, both in terms of time and expense of scoring, impedes progress in the investigation of this particular subscale.

The need to investigate the relationship between personality variables was indicated in Chapter I and substantiating evidence was presented in the review of studies investigating these variables as they relate to academic achievement. Since the investigation of the relationship between personality variables is largely uninvestigated, it is

difficult to determine whether the personality variables exert a direct influence on performance or whether their effect is due to an interaction with other variables or as feedback mechanisms.

The present study focused on two personality variables, the Achiever Personality and the self concept. Stepwise regression analyses were performed on nine self concept measures as well as the seven empirical scales, a self criticism scale, ACT scores and GPA in order to determine whether these relationships were linear or curvilinear. In this type of analysis, the program itself selects the best function. Results indicated that significant quadratic functions were found relating the Achiever Personality to Family Self, Personality Integration and GPA while significant linear functions obtained for Self Criticism, Identity, Moral Ethical Self, Behavior, Defensive Positive, Personality Disorder and Number of Deviant Signs.

With the exception of Personality Integration, it seems likely that the hypotheses for the empirical scales were originally misstated. If one can logically support the assertion of a curvilinear relationship between a need for academic achievement and the self concept, then logically this relationship would not obtain for measures of psychopathology.

Analysis of the data indicated that, of the self concept measures, only the Family Self was related in a curvilinear fashion to Achiever Personality. Identity and Behavior were related in a linear fashion and no relationship was found between the Achiever Personality and Self Esteem or Self Satisfaction. The results suggest that as the need for academic achievement increases, a positive sense of what one is and how one acts increases, but without a sense of self satisfaction, self esteem is lacking. As the need for academic achievement increases,

one's perception of oneself as a worthy family member increases up to a point, but beyond this point, a decrement is observed. It appears that fostering attributes associated with a need for academic achievement, particularly within the family, is beneficial up to a point; but beyond this point, detrimental in terms of personality development.

This conclusion is supported by the curvilinear trend found between Achiever Personality and Personality Integration (level of Adjustment) and further substantiated by the highly significant linear trend found between the Achiever Personality and Personality Disorder and Number of Deviant Signs.

It appears from the data that indiscriminant reinforcement of the need to achieve at a high level academically is contraindicated for reasons of good mental health. Emphasis might better be placed on a level of achievement adequate for attaining realistic goals set by the individual which contribute to his own satisfaction and his feelings of self esteem.

The family appears to be critical in the development of these attributes. The school is in a good position to identify warp when it occurs and in helping redirect the energies of the individual as well as counseling with parents.

Recommendations

The present study attempted to investigate personality variables in their relationship to academic achievement. The next logical step would be to investigate the effect that the various self concept measures as well as the empirical scales exert on the prediction of GPA. For this purpose, a stepwise regression analysis is recommended, using these

variables along with the Achiever Personality and ability. This type of analysis would provide a systematic selection of the variables making a significant contribution to academic success.

Most studies attempting to predict GPA have started with some measure of ability. It would be interesting to reanalyze the data entering the Achiever Personality in the equation first, since results of the present investigation were limited to an evaluation of this variable after ability had been accounted for. It is possible that this variable is accounting for more of the variation in the criterion than is evident by virtue of its entry position in the formula.

These recommendations would constitute logical "next steps" under the assumption that the relationship between personality variables and GPA is linear. If future research demonstrates this model untenable, as the stepwise regression analysis indicated, different procedures for analyzing the data would be required.

It would be of interest to determine the contribution that the Achiever Personality scale makes to the prediction of academic performance for students in different departments within the same university. It is not unlikely that the high achieving student of education, art, and physics involves a somewhat different complex of personality variables. To the extent that these variables can be identified, predictions could be made at a higher level of accuracy.

It is recommended that studies investigating personality variables begin by focusing on students within a given discipline or department. Although science aims at generality, failure to include the situation within which these personality variables operate as a critical independent variable very likely accounts for much of the confusion and

inconsistency found in these studies.

The Study in Context

If subsequent research on personality and socio-environmental factors produced a model of high level accuracy in predicting academic achievement, it could be used by college admission officers, college advisers, high school guidance counselors, deans, and teachers in aiding the student with the decision making process to the benefit of both the student and the institution. However, the question arises as to whether this sort of model is sufficient for admission to a particular institution or plan of study. Probably not, since there is little evidence that school grades alone are closely related to any significant criteria beyond the completion of an educational career. It is a well known fact that many distinguished citizens had academic records which were hardly outstanding, even though their college experience benefited them in some significant but unknown way not measured by grade average. At the present time we know very little about the relationship of the educational experience to significant aspects of life after completion of school. For this reason additional dimensions of student performance and the relationships of these dimensions to aspects of life after the completion of school need to be discovered.

If these dimensions could be discovered and incorporated into the model, such knowledge could be used not only by admission officers but also for modification of the institution in order to facilitate the long term goals of both the institution and the student.

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